UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

FORM 10-K

☒ **ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

FOR THE FISCAL YEAR ENDED DECEMBER 31, 2020

OR

☐ **TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

FOR THE TRANSITION PERIOD FROM TO

COMMISSION FILE NO. 001-14888

INOVIO PHARMACEUTICALS, INC.
(EXACT NAME OF REGISTRANT AS SPECIFIED IN ITS CHARTER)

Delaware	**33-0969592**
(State or other jurisdiction of incorporation or organization)	**(I.R.S. Employer Identification No.)**
660 W. Germantown Pike, Suite 110 Plymouth Meeting, Pennsylvania	**19462**
(Address of principal executive offices)	**(Zip Code)**

REGISTRANT'S TELEPHONE NUMBER, INCLUDING AREA CODE: (267) 440-4200

SECURITIES REGISTERED PURSUANT TO SECTION 12(B) OF THE ACT:

Title of Each Class	Trading Symbol(s)	Name of Each Exchange on Which Registered
COMMON STOCK, $0.001 PAR VALUE	INO	Nasdaq Global Select Market

SECURITIES REGISTERED PURSUANT TO SECTION 12(G) OF THE ACT: NONE

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes ☒ No ☐

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Act. Yes ☐ No ☒

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the Registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes ☒ No ☐

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T during the preceding 12 months (or for such shorter period that the registrant was required to submit such files). Yes ☒ No ☐

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company, or emerging growth company. See definitions of "large accelerated filer," "accelerated filer," "smaller reporting company," and "emerging growth company" in Rule 12b-2 of the Exchange Act. (Check one):

Large accelerated filer	☒	Accelerated filer	☐
Non-accelerated filer	☐	Smaller reporting company	☐
		Emerging growth company	☐

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. ☐

Indicate by check mark whether the registrant has filed a report on and attestation to its management's assessment of the effectiveness of its internal control over financial reporting under Section 404(b) of the Sarbanes-Oxley Act (15 U.S.C. 7262(b)) by the registered public accounting firm that prepared or issued its audit report.☒

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Act). Yes ☐ No ☒

The aggregate market value of the voting and non-voting common equity (which consists solely of shares of Common Stock) held by non-affiliates of the Registrant as of June 30, 2020 was approximately $4.2 billion based on $26.95 per share, the closing price on that date of the Registrant's Common Stock on the Nasdaq Global Select Market.

The number of shares outstanding of the Registrant's Common Stock, $0.001 par value, was 207,632,584 as of February 26, 2021.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the registrant's definitive proxy statement to be filed with the Commission pursuant to Regulation 14A in connection with the registrant's 2021 Annual Meeting of Stockholders (the "Proxy Statement") are incorporated by reference into Part III of this Report. Such Proxy Statement will be filed with the Commission not later than 120 days after the conclusion of the registrant's fiscal year ended December 31, 2020.

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Unless stated to the contrary, or unless the context otherwise requires, references to "INOVIO," "the company," "our company," "our," or "we" in this report include Inovio Pharmaceuticals, Inc. and its subsidiaries.

PART I

ITEM 1. BUSINESS

This Annual Report on Form 10-K (including the following section regarding Management's Discussion and Analysis of Financial Condition and Results of Operations), or this Annual Report, contains forward-looking statements regarding our business, financial condition, results of operations and prospects. Words such as "expects," "anticipates," "intends," "plans," "believes," "seeks," "estimates" and similar expressions or variations of such words are intended to identify forward-looking statements, but are not the exclusive means of identifying forward-looking statements in this Annual Report. Additionally, statements concerning future matters, including statements regarding our business, our financial position, the research and development of our products and other statements regarding matters that are not historical are forward-looking statements.

Although forward-looking statements in this Annual Report reflect the good faith judgment of our management, such statements can only be based on facts and factors currently known by us. Consequently, forward-looking statements are inherently subject to risks and uncertainties and actual results and outcomes may differ materially from the results and outcomes discussed in or anticipated by the forward-looking statements. Factors that could cause or contribute to such differences in results and outcomes include without limitation those discussed under the heading "Risk Factors" below, as well as those discussed elsewhere in this Annual Report. Readers are urged not to place undue reliance on these forward-looking statements, which speak only as of the date of this Annual Report. We undertake no obligation to revise or update any forward-looking statements in order to reflect any event or circumstance that may arise after the date of this Annual Report. Readers are urged to carefully review and consider the various disclosures made in this Annual Report, which attempt to advise interested parties of the risks and factors that may affect our business, financial condition, results of operations and prospects.

This Annual Report includes trademarks and registered trademarks of Inovio Pharmaceuticals, Inc. Products or service names of other companies mentioned in this Annual Report may be trademarks or registered trademarks of their respective owners. References herein to "we," "our," "us," "INOVIO" or the "Company" refer to Inovio Pharmaceuticals, Inc. and its subsidiaries. References herein to "DNA medicines" refers to INOVIO's product candidates for cancer and infectious diseases in development.

Company Overview

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 human papillomavirus (HPV). Our DNA medicines pipeline is comprised of three types of product candidates: DNA vaccines, DNA immunotherapies and DNA encoded monoclonal antibodies (dMAbs®). In clinical trials, we have demonstrated that DNA medicines can be delivered directly into cells in the body through our proprietary smart device to consistently activate robust and fully functional T cell and antibody responses against targeted pathogens and cancers.

Our corporate strategy is to advance, protect and, once approved, commercialize our novel DNA medicines to meet urgent and emerging global health needs. We continue to advance and clinically validate an array of DNA medicine candidates that target HPV-associated diseases, cancer, and infectious diseases, such as COVID-19 (SARS-CoV-2). We aim to advance these candidates through commercialization and continue to leverage third-party resources through collaborations and partnerships, including product license agreements.

Our novel DNA medicine candidates are made using our proprietary SynCon® technology that uses a computer algorithm to identify and optimize the DNA sequence of the target antigen (proteins associated with a cancer or infectious disease that the body will recognize as foreign or not normal). INOVIO then creates optimized plasmids, which are circular strands of DNA that instruct a cell to produce the target antigen to help the person's immune system recognize and destroy cancerous or virally infected cells.

Our patented CELLECTRA® smart delivery devices provide optimized uptake, or absorption, of our DNA medicines within the cell, overcoming a key limitation of other DNA-based technology approaches.

Human clinical trial data to date has shown a favorable safety profile of our DNA medicines in more than 7,000 administrations across more than 3,000 patients.

Specifically, our lead product candidate VGX-3100, currently in Phase 3 trials for precancerous cervical high-grade squamous intraepithelial lesions (HSIL), cleared high-risk HPV-16 and/or HPV-18 in a Phase 2b clinical trial. Also in clinical development are programs targeting HPV-associated cancers and a rare HPV-associated disease, recurrent respiratory papillomatosis (RRP); non-HPV-associated 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.

For our COVID-19 vaccine program, INO-4800, we published Phase 1 clinical data from the first cohort of 40 participants in *EClinicalMedicine*, an open access clinical journal published by *The Lancet*, in December 2020. 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). Furthermore, the 1.0 mg and 2.0 mg dose groups both demonstrated seroconversion in 95% of 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 receptor binding domain 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.

We are currently conducting the Phase 2 segment of our planned Phase 2/3 clinical trial for INO-4800, called INNOVATE (**IN**OVIO I**NO**-4800 **Va**ccine **T**rial for **E**fficacy). INNOVATE is a randomized, blinded, placebo-controlled safety and efficacy trial of INO-4800 conducted in adults in the U.S. It is being 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 agreed to provide funding for both the Phase 2 and Phase 3 segments of the INNOVATE clinical trial, in addition to the $71.1 million of funding previously announced in June 2020 for the large-scale manufacture of the company's proprietary smart device, CELLECTRA® 3PSP, production of doses and the procurement of CELLECTRA® 2000 devices.

Our partners and collaborators include Advaccine Biopharmaceuticals Suzhou Co., Ltd. (Advaccine), ApolloBio Corporation, AstraZeneca, the Bill & Melinda Gates Foundation, CEPI, DARPA/JPEO-CBRND)/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, Plumbline Life Sciences, Regeneron, Richter-Helm BioLogics, Thermo Fisher Scientific, University of Pennsylvania, Walter Reed Army Institute of Research, and The Wistar Institute.

Summary Risk Factors

Our business is subject to a number of risks, including risks that may prevent us from achieving our business objectives or may adversely affect our business, financial condition, results of operations, cash flows and prospects. These risks are discussed more fully in Item 1A. Risk Factors herein. These risk factors include, but are not limited to, the following:

- Our business could be adversely affected by the effects of health epidemics, including the global COVID-19 pandemic.
- We have incurred significant losses in recent years, expect to incur significant net losses in the foreseeable future and may never become profitable.
- We are currently subject to litigation and may become subject to additional litigation, which could harm our business, financial condition and reputation.
- Our planned clinical development of INO-4800 as a potential COVID-19 vaccine has been placed on partial clinical hold by the FDA, which may cause delays in the commencement of our planned Phase 3 clinical trial or completion of clinical testing, both of which could result in increased costs to us and delay or limit our ability to proceed to commercialization and generate revenues.
- There can be no assurance that the product we are developing for COVID-19 would be granted an Emergency Use Authorization by the FDA or similar authorization by regulatory authorities outside of the United States if we were to decide to apply for such an authorization. If we do not apply for such an authorization or, if we do apply and no authorization is granted or, once granted, it is terminated, we will be unable to sell our product in the near future and instead, will be required to pursue the biologic licensure process in order to sell our product, which is lengthy and expensive.
- Delays in the commencement or completion of clinical testing could result in increased costs to us and delay or limit our ability to generate revenues.
- None of our human vaccine candidates, including INO-4800, or our immunotherapy and DNA encoded monoclonal antibody product candidates have been approved for sale, and we may never develop commercially successful vaccine, immunotherapy or monoclonal antibody products.
- We will need substantial additional capital to develop our DNA vaccines, DNA immunotherapies and dMAb programs and electroporation delivery technology.
- If we lose or are unable to secure collaborators or partners, or if our collaborators or partners do not apply adequate resources to their relationships with us, our product development and potential for profitability will suffer.
- A small number of licensing partners and government contracts account for a substantial portion of our revenue.
- We have agreements with government agencies, which are subject to termination and uncertain future funding.
- We face intense and increasing competition and many of our competitors have significantly greater resources and experience.

- If we and the contract manufacturers upon whom we rely fail to produce our electroporation devices and product candidates in the volumes that we require on a timely basis, or at all, or fail to comply with their obligations to us or with stringent regulations, we may face delays in the development and commercialization of our electroporation equipment and product candidates.
- It is difficult and costly to generate and protect our intellectual property and our proprietary technologies, and we may not be able to ensure their protection.
- If we are sued for infringing intellectual property rights of third parties, it will be costly and time-consuming, and an unfavorable outcome in that litigation would have a material adverse effect on our business.

Our Differentiated DNA Medicines Platform

Overview of Our Platform

Our DNA medicines platform uses precisely designed DNA plasmids, which are circular strands of DNA that contain an optimized genetic sequence of an antigen (protein) or monoclonal antibody specific to a targeted disease to be produced inside a patient's own body. Our proprietary design and optimization process for our DNA plasmids is called SynCon®. These plasmids are delivered directly into cells in the body intramuscularly or intradermally via our proprietary CELLECTRA® smart devices, which use brief electrical pulses to reversibly open small pores in the cell, enabling DNA plasmids to enter. Once inside the cell, the plasmids instruct the body's cellular machinery to temporarily produce the target antigen or monoclonal antibody. We believe our DNA medicines platform offers versatile capabilities, both in terms of addressing a number of disease targets as well as providing us with several product development opportunities.

The characteristics and core components of our DNA medicines platform include:

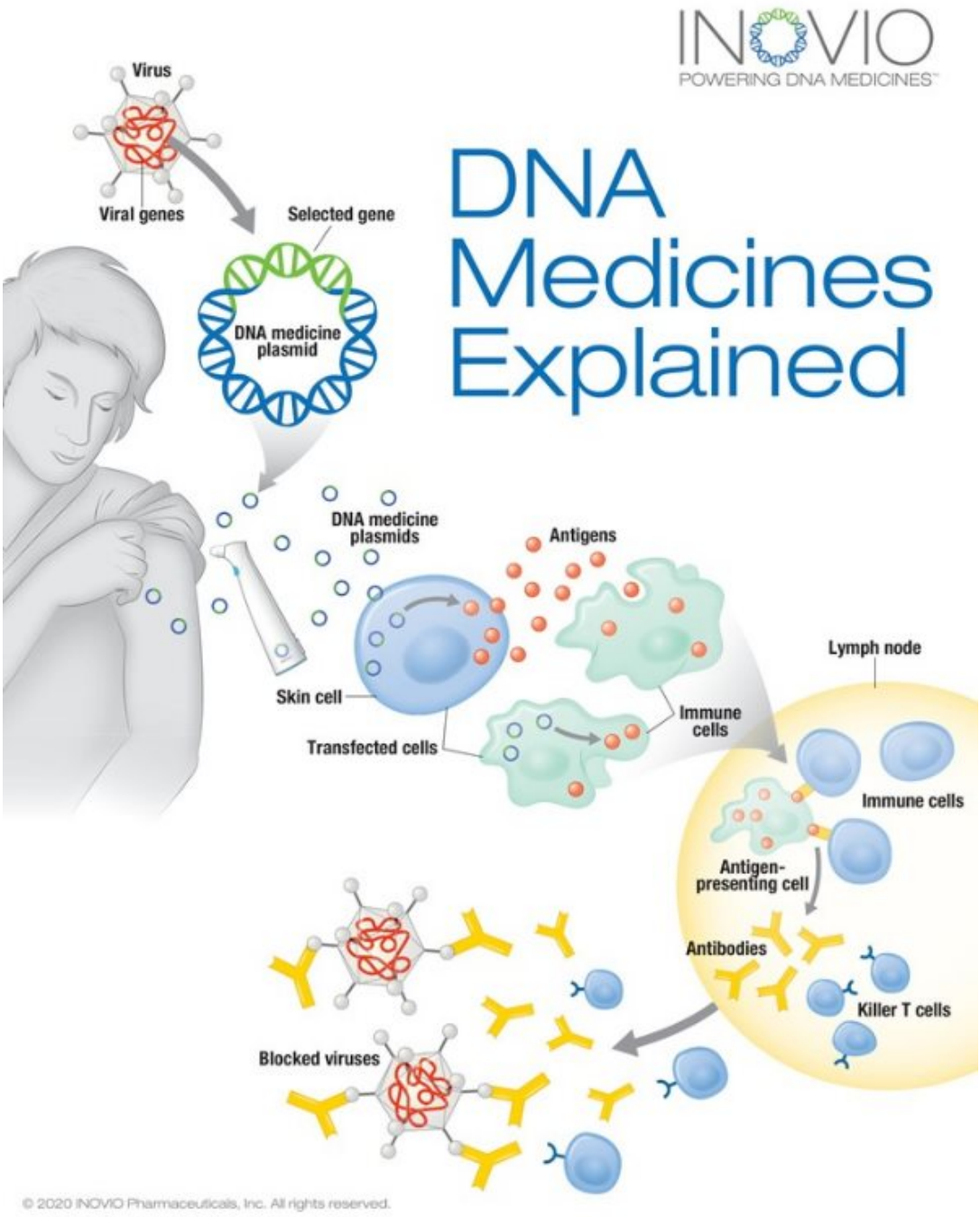
1. **SynCon® Design Process:** Our SynCon® optimized plasmids have shown the ability to help break the immune system's tolerance of cancerous or infected cells and facilitate cross-strain protection against unmatched and matched pathogen variants.

2. CELLECTRA® Smart Device: Once our DNA medicines are injected into the cells of the body using our proprietary smart device, the DNA plasmids instruct the cell to temporarily produce the target antigen or monoclonal antibody. The antigen is processed naturally in the cell and induces the immune system to generate antibodies and/or T cells that perform preventive or therapeutic functions. Similarly, dMAbs® generated in this manner can also trigger desired immune system functions.

3. Our DNA medicines have generated best-in-class *in vivo* (within the body) immune responses: With our core platform technology, we have developed a pipeline of clinical-stage product candidates that have generated best-in-class in vivo immune responses, in particular CD4+ and CD8+ T cells that are fundamental in eliminating cancerous or infected cells.

4. Our DNA medicines work naturally with the immune system: Compared to other technologies, our DNA medicines are designed to work more naturally with the immune system to reduce or minimize the risk of unwanted inflammatory responses.

The mechanism of action for our DNA medicines and the process for administration of our DNA medicines are summarized in the following graphic:


INOVIO
POWERING DNA MEDICINES
DNA Medicines Explained
Virus
Viral genes
Selected gene
DNA medicine plasmid
DNA medicine plasmids
Antigens
Skin cell
Transfected cells
Immune cells
Lymph node
Immune cells
Antigen-presenting cell
Antibodies
Killer T cells
Blocked viruses
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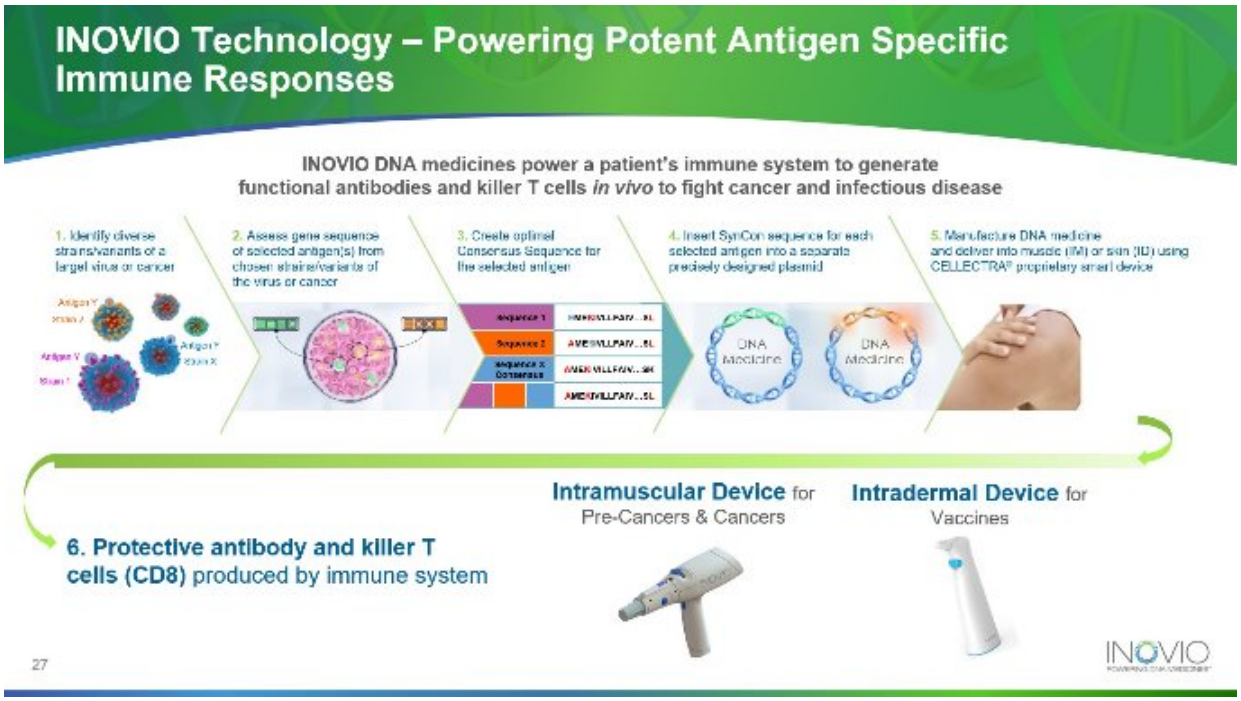


Nucleic Acid Vaccines: Similarities and Differences between DNA and mRNA-based Approaches

The use of nucleic acid-based vectors (DNA or RNA) as an alternative to traditional immunization is a strategy that has been under development for many years. We believe that the approval for emergency use authorization of two mRNA-based vaccines for COVID-19 in 2020 proves the power of nucleic acids, which are also core to DNA-based vaccines.

DNA-based vaccines are composed of purified, closed-circular plasmid DNA containing genes that encode target antigens. Historical studies have shown the ability for DNA-based vaccines to generate immune responses against various pathogens in diverse animal species. Immunization with DNA-based plasmids has also been successfully attempted in several tissues by various routes of administration, with most experiments being conducted with DNA delivered to skeletal muscle or the skin. Past experimental studies involving nucleic acid vaccines targeted a broad range of infectious diseases which included leishmaniasis, tuberculosis, malaria, and hepatitis.

Over the past decade, the scientific community and the vaccine industry have been asked to respond urgently to various epidemics, including but not limited to: H1N1 influenza, Ebola, Zika and, most recently, SARS-CoV-2, the virus that causes COVID-19. Today, multiple platforms are under development in the fight against COVID-19. Among those are DNA- and RNA-based platforms, along with those for developing viral vectors and recombinant-subunit vaccines.

INOVIO's efforts to develop a DNA vaccine candidate for COVID-19 is based on the suitability and scalability of our DNA medicines platform, as well as our track record of rapidly generating promising countermeasures against previous pandemic threats. INOVIO was the first company to advance a vaccine against MERS-CoV, a related coronavirus, into clinical evaluation in humans.

INOVIO's DNA Medicines' Differentiation from mRNA

While DNA and RNA both use fragments of genetic materials that, once injected, instruct the body to fight pathogens, cancer and infectious disease, there are unique advantages to DNA vaccines compared to RNA vaccines. While it has been demonstrated that DNA vaccines allow for the option of repeated administration, RNA vaccines specific nanolipidic formulation may impair re-administration, and, on balance, they have resulted in weaker CD8 T cell responses, require colder storage temperature than Antarctica for transportation, require complex lipid nano particle (LNP) formulations for scaling, and are on average more expensive when considering manufacturing and distribution. INOVIO's DNA vaccines offer several key potential advantages:

a. **Well-tolerated:** Our DNA vaccines appear to be well-tolerated when evaluated against multiple disease targets.

b. **Stability of Product:** Our DNA vaccines are stable for more than a year at room temperature or for more than a month at 37º C, have a five-year projected shelf life at normal refrigeration temperature and do not require frozen cold storage or shipping.

c. **Rapid Design and Manufacture:** Similar to mRNA vaccines, our DNA vaccines can be rapidly designed and scaled, which are critical aspects in addressing global pandemics like COVID-19.

d. **T Cell Responses:** Our DNA vaccines have demonstrated ability to generate high levels of T cell (CD4+ and CD8+) responses along with antibody responses. The CD8+ T cell responses in particular are regarded to be very important in their ability to clear tumor cells in the body as well as to fight off infections.

e. **Ability to Safely Readminister DNA Vaccines:** Our DNA vaccines have been used to boost our vaccines' immunity profile with repeat administration with our DNA vaccines. Our DNA vaccines could be safely readministered if immunity weans, offering the possibility for seasonal boosting usage without any concerns of generating an anti-vector response.

Our DNA Medicines Platform in Detail: Delivery Science

The goal of our DNA medicines platform is to generate and deliver safe and effective therapeutics and vaccines. Our technologies allows us to enable *in vivo* generation of functional immune responses to achieve desired therapeutic and preventive outcomes. Historically, we have focused primarily on *in vivo* production of disease-specific antigens directly in the body to stimulate prophylactic or therapeutic immune responses. More recently, we have explored an additional new application for the platform: *in vivo* generation of monoclonal antibodies to achieve preventive and therapeutic outcomes complementary to our antigen-generating immunotherapies.

With these core technologies, we have developed a robust pipeline of 15 clinical-stage programs that have generated robust *in vivo* immune responses, in particular CD4+ and CD8+ T cell responses, which are fundamental in eliminating cancerous or infected cells.

There are two components to our DNA medicines platform. The first is a biological component, by which we encode proteins (antigens, monoclonal antibodies, interleukins i.e.IL-12) into closed-circular DNA plasmids. These DNA plasmids encode highly optimized antigens or transgene proteins that drive increased expression intracellularly while also driving immune responses. The second component is our proprietary CELLECTRA® smart devices technology, which facilitates delivery of the DNA plasmids.

The resulting immune responses from DNA medicine administration then neutralize or eliminate infectious agents, such as viruses, bacteria, and other microorganisms, or abnormal cells, such as malignant tumor or infected cells. T cells can be immediately "trafficked" to parts of the body where cells are displaying the target antigen. Memory cells are also created for durable effects.

Our SynCon® DNA medicines are designed to generate antigen-specific antibody and T cell responses. First, we identify one or more antigens that we believe are the best targets, based on extensive due diligence, pre-clinical and clinical data that we have evaluated to direct the immune system toward a particular cancer or infectious disease. We then apply our SynCon® design process, which uses the genetic make-up of the selected antigens from multiple variants of a cancer or strains of a virus.

For each antigen, we create a new genetic sequence that represents a nucleotide consensus sequence of the targeted antigen from multiple virus variants or strains. We can create a differentiated SynCon® variant to help the immune system better recognize a cancer self-antigen (from a cancerous cell grown in the body) and "break the tolerance" of those cancer cells within the body. In human clinical trials, we have generated immune responses with SynCon® DNA medicines that were not matched to different strains of an infectious disease, such as influenza or HIV, indicating that such immunotherapies may have more universal protective capabilities against unmatched strains of a circulating virus. As a result, these SynCon® constructs may provide a solution to broadly cover the genetic "shift" and "drift" that is typical of many infectious diseases. Since the new engineered Syncon® sequence is closely similar to the originating sequences but does not match any, so we believe it is patentable.

The SynCon® sequence is then inserted into a circular DNA plasmid with its own promoter. The plasmid is optimized at the DNA level for codon usage, improved stability of mRNA, and provided with enhanced and proprietary leader sequences for ribosome loading; it is optimized at the genetic level to enable high expression in human cells. We believe these design capabilities allow us to better target appropriate immune system mechanisms and produce a higher level of the coded antigen to enhance the overall ability of the immunotherapy to induce the desired immune response.

The plasmids are then manufactured in a bacterial fermentation process using scalable technology. These manufactured DNA medicines can be stable under normal environmental conditions for extended periods of time.

Our DNA medicines platform also allows for rapid design, pre-clinical testing, manufacturing at scale, and clinical development of both our DNA vaccine and DNA immunotherapy product candidates. Speed is an important feature,

particularly as it relates to developing a response to globally emerging infectious diseases such as COVID-19. Responses to emerging infectious diseases that we have been involved in are described in more detail below.

CELLECTRA® Delivery Technology

Our DNA medicines are delivered directly into cells of the body intramuscularly or intradermally in a small local area of tissue using our proprietary CELLECTRA® smart devices. CELLECTRA® smart devices use brief electrical pulses to reversibly open small pores in the cell, enabling DNA plasmids to enter. Through this process, the cellular uptake of the DNA plasmids increases by more than 1,000 fold compared to the injection of a DNA plasmid alone without other delivery mechanisms. This improved cellular uptake has enabled the immune responses observed in our clinical trials along with the efficacy results generated by these immune responses.

Alternative delivery approaches based on the use of virus-based vectors, bacteria, nanoparticles and lipids are complex and expensive and have generated safety concerns. Because those alternative delivery vectors themselves possess many additional antigens specific to the vector, they can attract unwanted immune responses that are believed to compromise the vectors' ability to deliver their genetic "payload" and produce the desired immune response. In contrast, a DNA plasmid vector possesses no antigens of its own, the plasmid results in production of only the target antigen.

We have published preclinical data in which we observed improved immune responses generated by our SynCon® DNA medicines delivered using CELLECTRA® smart devices compared to a leading viral vector-based approach (Adenovirus type 5). The delivery of DNA medicines using CELLECTRA® smart devices to date has shown a favorable safety profile in clinical trials, without serious adverse events and only transient and mild local injection-related side effects such as redness and swelling. Our delivery system based approach is designed to be tolerable without the need for an anesthetic, and because it does not induce side effects, it can be repeatedly administered for booster/maintenance vaccinations.

We believe our CELLECTRA® smart devices provide a straightforward, cost-effective method for delivering our DNA medicines into cells with high efficiency, minimal complications and the ability to enable what we believe to be clinically relevant levels of gene expression, immune responses, and efficacy.

Choice of Tissue for DNA Medicine Delivery

Skeletal muscle has been a core focus for delivery of DNA medicines via CELLECTRA® because it is mainly composed of large, elongated cells that are non short-term dividing, meaning that longer-term expression can be obtained without integration of the gene of interest into the genome. We have generated pre-clinical and clinical evidence that muscle cells may have a capacity for secretion of proteins into the bloodstream. Secreted therapeutic proteins may therefore act systemically and produce therapeutic effects in distant tissues of the body. In this respect, the muscle functions as a production factory for the biopharmaceutical needed by the body. We envision that CELLECTRA®-delivered DNA medicines to muscle cells will circumvent the costly and complicated production procedures of viral based delivery vectors, bacterial based delivery vectors, protein-based drugs, conventional vaccines and recombinant monoclonal antibodies. This approach may provide long-term stable expression of a therapeutic protein or monoclonal antibody at a sustained level.

In addition to generating pre-clinical and clinical evidence that intramuscular DNA delivery can be effective for a number of immunotherapies, we are also exploring delivery to the skin as an optimal route of administration for DNA vaccines. Skin, or intradermal, administration is an attractive site for immunization given its high density of antigen presenting cells. Unlike muscle, skin is the first line of defense against most pathogens and is therefore rich in immune cells and molecules that may generate a robust immune response. With intradermal delivery, we may be able to demonstrate a comparable cellular immune response to muscle delivery.

Our CELLECTRA® Smart Delivery Systems

There are several configurations in the CELLECTRA® smart device family. The first configuration covers intramuscular (IM) delivery, while the second covers intradermal/subcutaneous delivery (ID). Smart devices with these configurations have been validated, manufactured under Current Good Manufacturing Practices (cGMP) and are being used in human clinical trials. We have filed device master files with the U.S. Food and Drug Administration (FDA) covering the use of the CELLECTRA® smart devices in human clinical trials.

Our CELLECTRA®-SP smart devices combine the functionality of our current generation of skin and intramuscular devices in clinical testing with enhanced form, design and portability. All components of the pulse generator and applicator are integrated into a cordless, rechargeable device. The rechargeable battery can enable immunization of several hundred subjects, making the device useful for mass vaccinations. The devices are designed to accommodate different electrode arrays to meet the requirements of the particular DNA medicine and targeted tissue for delivery.

Next-Generation Smart Device Development

We are also advancing a new generation of ID delivery devices called CELLECTRA®-3P. Currently used ID devices penetrate no more than 3 mm into the target tissue, compared to IM devices that go deeper. All of our current vaccine clinical studies are using these CELLECTRA®-3P smart devices.

The medical arm of the U.S. Defense Threat Reduction Agency (DTRA) has agreed to fund the further development of our commercial ID delivery device or CELLECTRA 3PSP®. DTRA provided $8.14 million of grant funding to support us in developing a small, portable, battery-powered ID device to be branded as CELLECTRA®-3PSP, which will be used in the administration of our vaccines and therapies, including DTRA-developed products. In addition to the development of CELLECTRA®-3PSP, this award will fund the investigation of DNA vaccines developed by the U.S. Army Medical Research Institute of Infectious Diseases (USAMRIID) using the new device.

In June 2020, we were awarded $71.1 million in funding from the U.S. Department of Defense (DoD) to support the large-scale manufacture of the CELLECTRA® 3PSP smart device, production of doses and the procurement of CELLECTRA® 2000 devices. The DoD contract, from the JPEO-CRBND-EB through funding provided by the Defense Health Program, builds upon two separate prior $5 million grants from the Bill & Melinda Gates Foundation and CEPI, to accelerate the testing of CELLECTRA® 3PSP.

Background on DNA Medicines and Immuno-Oncology

Multiple technology advancements and product approvals have highlighted the potential of immunotherapies to usher in a new era of cancer therapeutics. Monoclonal antibodies (mAbs) such as Herceptin® and dendritic cell therapy Provenge® for prostate cancer have had varying degrees of success. While a significant step forward, suitable monoclonal antibodies with desired characteristics have been difficult to design or identify and expensive to produce, and the technology does not lend itself to designing mAbs for many diseases. Dendritic, or other cell-based therapy, is a highly personalized medicine involving removing cells from the patient, modifying, multiplying, and then returning them to the body. In addition to the high-cost and complex processes to manufacture products, a weakness of this approach is that it has not been shown to generate high levels of cancer-specific T cells.

Progress in the field of immune checkpoint inhibitors (CIs) has resulted in optimism regarding the potential for new immunotherapies against a spectrum of cancers. The immune system relies on a safeguard system of checkpoint mechanisms to prevent excessive or incorrectly directed immune responses. Many cancer cells can “hijack” these checkpoints and neutralize T cells sent by the immune system to eliminate them. CIs prevent cancer cells’ from interfering with these checkpoints and enable T cells (especially CD8+ killer T cells) to complete their killing function against cancer cells. Clinical trials of CIs have shown notable therapeutic impact against melanoma and other cancers, but with response rates in the 15-20% range (and only in the case of melanoma going up to the 40% range or higher), there remains a significant opportunity. Observations suggest CIs may be less effective if there is not a high enough pre-existing level of antigen-specific CD8+ T cells in the tumor micro-environment, meaning that the tumor is “cold” rather than “hot” (with a significant level of CD8+ T cells). More recently, scientists have recognized that a strong CD8+ T cell generating “active” immunotherapy may be able to transform a "cold" tumor into a "hot" tumor and in combination with CIs may possess significant therapeutic potential to fight cancers.

More recently, a new category of immunotherapies called adoptive cell transfer, for example CAR-T technology, has provided further evidence of the merit of providing an enhanced T cell presence to fight cancer. CAR-T therapies have achieved dramatic results, most notably in B cell cancers. Unfortunately, they have also been associated with significant side effects. When this technology has been applied to solid tumors, it has generated significant cytokine storms that have resulted in severe side effects, including deaths. Moreover, adoptive cell transfer such as CAR-T, like dendritic cell therapy, involves removing T cells from a patient, modifying them to better target a cancer cell, multiplying the T cells, then returning them to the patient. These complex therapeutic products need to be manufactured and released for each patient, leading to expensive and timely manufacturing, as well as increased supply chain complexity.

To summarize, while there have been promising advancements in recent years that better harness or activate capable killer T cells, we believe there is still significant untapped potential to develop “ideal” immunotherapies to fight cancers and infectious diseases.

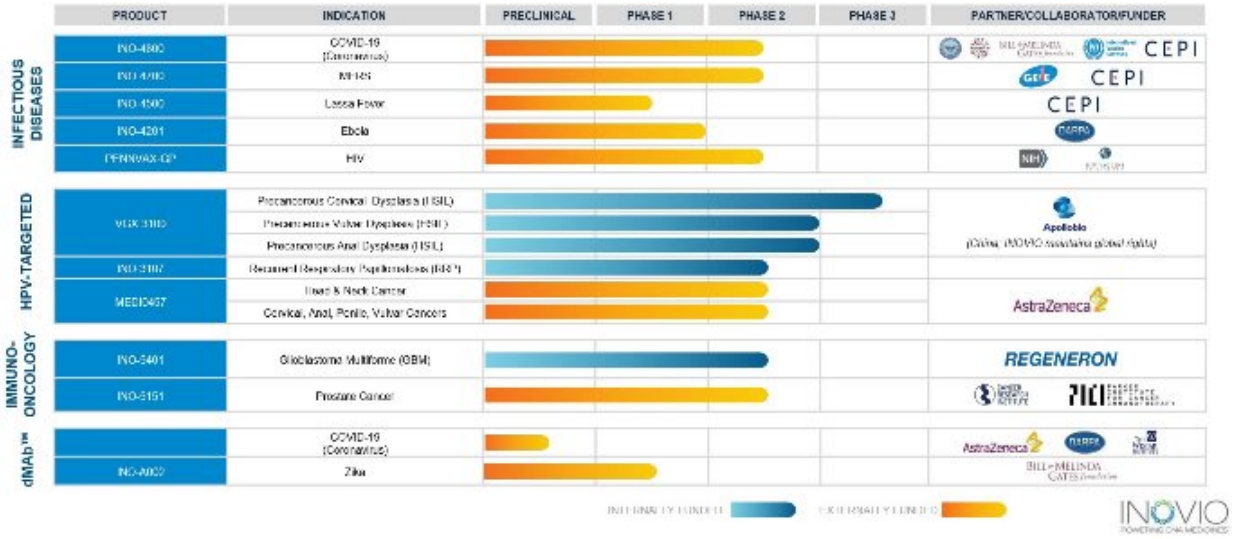
We seek to advance product candidates that:

- Target disease-specific antigens or proteins unique to a cancer or infectious disease;
- Do not depend on complex manufacturing processes;
- Activate functional killer T cells;
- Generate robust T cell responses or a significant number of T cells that are persistent and durable over time (memory response);
- Do not induce toxic inflammatory responses; and
- Are capable of “breaking tolerance” of cancer cells grown in the body.

Data from our Phase 2b data of VGX-3100, discussed below, lead us to believe our approach to activating significant antigen-targeted T cells may achieve these characteristics. Accordingly, we are advancing a pipeline of pre-clinical and clinical immunotherapy product candidates.

Our DNA Medicines in Development

The chart below summarizes the status of our active DNA medicines development programs, each of which is described in more detail following the chart.



VGX-3100 for the Treatment of HPV-associated Precancerous Lesions

Overview and Background

HPV is a sexually-transmitted, persistent infection with one or more high-risk (HR) genotypes of that virus can lead to, and thus are the causative agents responsible for, cervical pre-cancers (cervical dysplasia), cervical cancer, other anogenital cancers, and head & neck cancer, which is one of the most rapidly growing cancers in men. Scientific literature estimates that, at any given time, approximately 43% of the U.S. adult population is infected with HPV, and about 25% of adult men and 20% of adult women in the U.S. have a genital infection with one or more HR-HPV genotypes. Worldwide, the prevalence of cervical HPV infection in women overall (all ages combined) averages about 12%. However, this varies widely by age and geography -- in some regions of the world, e.g. Africa, the cervical HPV prevalence by age reaches about 45%. The lifetime risk for acquiring an HPV infection of any genotype is about 80% for people worldwide. In a recently published analysis, U.S. Centers for Disease Control and Prevention (CDC) estimates that 13 million new urogenital HPV infections occurred in year 2018 in persons aged 15 to 59 years alone in the United States., with about 42.5 million persons in that age group being HPV infected at any time during that year. That study also estimates that HPV comprised 50% of all incident infections and 63% of all prevalent sexually transmitted incident infections due to any agent. Nearly half of HPV infections are in the age group 15 to 24 years.

HPV is the most common viral infection of the reproductive tract and is the major cause of cervical cancers. Almost 300 million women globally are estimated to be infected with HPV, with another 30 million additional cases that have progressed to the pre-cancerous stage. In the United States, an estimated 14,480 new cases of cervical cancer will occur in 2021, and an estimated 4,290 women will die of cervical cancer that year. Worldwide, the International Agency for Research on Cancer (IARC) estimates that more than 604,000 new cases of cervical cancer occurred in 2020 and nearly 342,000 deaths. IARC predicts that nearly 850,000 new cases of cervical cancer and more than 524,000 deaths will occur worldwide in 2040. Virtually all cases are linked with persistent infection with HPV.

Challenges with acceptance, accessibility and compliance of vaccines to prevent HPV infection and their resulting pre-cancers and cancers have been substantial since such vaccination availability began in 2006 in the U.S. These challenges have resulted in many vaccine-eligible girls and women remaining unvaccinated and at risk. In 2017, a U.S. national survey found that only 57% of girls aged 13-17 years were up to date with the HPV vaccine series. However, we believe such surveys yield overestimates. One recently published US national assessment found that only about 46% of females age 15 had been vaccinated with two or more doses of the HPV vaccine. Even lower proportions have been vaccinated in some of the other countries around the world which have access to HPV vaccines.

While approximately 90% of genital HPV infections in women are ultimately cleared naturally by the body's own immune system within three years of incident infection, persistent cervical infection with one or more HR-HPV genotypes can lead to cervical HSILs and, if untreated, eventually invasive cervical cancer. Researchers have estimated the global prevalence of clinically pre-cancerous cervical HSILs at between 28 and 40 million. HPV-16 and HPV-18 are the two most prevalent high-risk types of HPV worldwide, causing the majority of HPV-associated cancers. In the United States, 43% of all cervical HSIL cases were attributable to HPV-16/18 in 2016, and about 70% of invasive cervical cancers are attributable to HPV-16/18 worldwide.

The estimated annual incidence of diagnosed cervical HSIL is up to 195,000 cases in the United States (including those uninsured, partially insured, and publicly insured) and approximately 263,000 to 503,000 cases in Europe. Patients with this condition represent a significant market opportunity for our product candidates.

To prevent HPV infection and the precancers and cancers it causes, there is currently one FDA-approved preventive vaccine available in the United States, called Gardasil® 9. That vaccine protects against infection by nine total HPV genotypes, consisting of seven genotypes that confer high-risk for cancer and two that confer risk for RRP and genital warts. However, preventive HPV vaccines cannot treat or protect those already infected with the same HPV genotypes, which is a large population. Currently there is no viable immunotherapy or drug to fight incident, prevalent, or persistent HPV infection or treat cervical HSIL.

Current management options for cervical HSIL are unappealing. The “watch-and-wait” process associated with low grade squamous intraepithelial lesions (LSIL, formerly called low-grade dysplasia or CIN 1) and in some young women with higher grade lesions (though only for the CIN 2 level of cervical HSIL) is a stressful approach. The only available treatment option for cervical HSIL is surgery, which involves ablating or cutting a women’s cervix to remove the pre-cancerous lesions. While surgical procedures are generally initially effective in removing lesions, they can lead to short-term adverse effects including cervical scarring, excess bleeding and infection, and to longer-term reproductive risks such as pre-term birth, miscarriage, and perhaps infertility. Current excisional and ablative procedures nearly double the overall risk of pre-term births from approximately 5% to 10%. Anticipation of these procedures produces significant anxiety for patients, despite their doctor’s reassurances, and full recovery from surgery can take up to several weeks. Because surgery does not clear the underlying HPV infection, there is a 10-16% chance of high-grade pre-cancer lesion recurrence after surgery as a result of persistent HPV infection and/or incomplete removal of the lesion, with the persistent HPV infection being the better predictor of recurrence.

Our therapeutic vaccine candidate VGX-3100 is designed to significantly increase T cell immune responses against the E6 and E7 oncogenic proteins of high-risk HPV types 16 and 18 that are present in both precancerous and cancerous cells transformed by these HPV types. E6 and E7 are oncogenes that play an integral role in transforming HPV-infected cells into precancerous and cancerous cells, thus making them appealing targets for T cell directed immunotherapy. The goal of VGX-3100 is to stimulate the body's immune system to mount a T cell response strong enough to kill the cells producing the E6/E7 protein. The potential of such an immunotherapy would be to treat precancerous dysplasias caused by these HPV types.

VGX-3100 for the Treatment of Cervical HSIL

Phase 2b Study Results

In 2015, we published clinical data from our randomized, placebo-controlled, double-blind Phase 2b study of VGX-3100. We initiated this study in 2011 using our CELLECTRA® device in women with HPV type 16 or 18 and diagnosed with, but not yet treated for, cervical HSIL (also called high grade cervical intraepithelial neoplasia (CIN 2/3)).

Analyses of patient immune responses showed that overall antigen-specific T cell levels in women treated with VGX-3100 were greater than those treated by placebo at all observation periods. At week 14, levels of CD8+ T cells specific to the E6 and E7 HPV antigens in women treated with VGX-3100 were ten times greater than those in the placebo group. This response increased with each of the three immunizations, then declined modestly to a sustained and durable level of T cells (memory T cells) measured through 36 weeks (24 weeks post-treatment).

Patients whose lesions regressed had higher frequencies of HPV-specific CD8+ T cells which co-expressed key molecules important in the T cell killing cascade and directly correlated with clinical efficacy. Specifically, higher levels of CD8+ killer T cells co-expressing checkpoint molecule CD137 on their surface, as well as the cytolytic protein perforin, were observed to be a predictive tool for efficacy. As a strong activation marker for CD8+ T cells, stimulation through CD137 has been shown in some systems to confer resistance of CD8+ T cells to the suppressive activity of regulatory T cells, indicating that its presence can identify tumor reactive T cells. Perforin is a pore-forming protein deployed by killer T cells to bore holes into the target cell's plasma membrane and destroy the cell. The difference in frequencies of CD8+ T cells expressing CD137 and perforin was greatest in patients who had both regressed their lesions and cleared HPV as compared to patients who did not.

To our knowledge, this was the first published study from which a direct correlation between antigen-specific CD8+ T cells generated *in vivo* and clinical efficacy was observed. We have identified several potential key biomarkers of killer T cells

that we believe can be used to predict the clinical efficacy of VGX-3100, as well as other immunotherapies, which we are seeking to confirm in our ongoing Phase 3 trial, described below.

Phase 2b Trial Design

The women in the Phase 2b study received either 6 mg of VGX-3100 or a placebo. VGX-3100 and placebo were administered using the CELLECTRA® device at months 0, 1 and 3. The study assessed efficacy by measuring regression of cervical lesions from high-grade to low-grade or normal in the treated versus control subjects. Immunological responses were also measured in this clinical study to assess the ability of this therapy to generate strong T cell responses in a larger, controlled study. Safety was also assessed.

The primary endpoint of the trial, histologic regression, was evaluated 36 weeks after the first treatment. In the per protocol analysis of this three-immunization regimen, cervical HSIL resolved to LSIL or no disease in 53 of 107 (49.5%) women treated with VGX-3100, compared to 11 of 36 (30.6%) who received placebo. This difference was statistically significant (p=0.017). Intent to treat results were also similar and statistically significant.

There was also a high level of complete clearance of cervical HSIL when compared to that of a normal cervix. In a post-hoc analysis, cervical HSIL resolved to no disease in 43 of 107 (40.2%) women treated with VGX-3100, compared to 6 of 36 (16.7%) who received placebo (p=0.006).

A secondary endpoint of the trial was virological clearance of HPV 16 or 18 from the cervix in conjunction with histopathological regression of cervical HSIL to low-grade or no disease. This endpoint was achieved in 43 of 107 (40.2%) VGX-3100 recipients, compared to 5 of 35 (14.3%) placebo recipients (p=0.001). We believe this is an important outcome, as persistence of the HPV virus is associated with recurrence of cervical HSIL.

All Phase 2b patients were monitored for an additional 52 weeks for a safety follow up. No significant safety issues were observed through week 88 following treatment.

Phase 3 Trial (REVEAL)

In preparation for pivotal Phase 3 development and commercialization, we completed a manufacturing technology-transfer to a commercial manufacturing facility and scaled up manufacturing of VGX-3100.

We also designed and manufactured a new smart delivery device, CELLECTRA®-5PSP, which is being used in our global Phase 3 clinical trial of VGX-3100. This smart device is a fully automated, smaller and user-friendly hand-held device. The new CELLECTRA®-5PSP smart device is being used in our ongoing VGX-3100 Phase 3 trial, which started in June 2017, and is being developed for potential commercial use.

We have conducted additional market research with physicians and patients to better understand the unmet medical needs relating to cervical HSIL. These include a preference for a non-invasive, non-surgical procedure for removing cervical lesions; a treatment that can clear HPV, the cause of the pre-cancer, throughout the body and not just in the limited area of the lesion; and a treatment that does not result in pre-term births or infertility. We believe that cervical HSIL represents a unique market opportunity for a novel therapy capable of providing a first-line alternative to surgery and in some cases even an alternative to watchful waiting. This market research will help guide our communication and interaction with the physician, patient and support communities.

Our Phase 3 program, named REVEAL, consists of a primary study (REVEAL 1) and confirmatory study (REVEAL 2), being conducted in parallel. The REVEAL1 study enrolled 201 subjects while enrollment of REVEAL 2 is ongoing.

The REVEAL studies are prospective, randomized (2:1), double-blind, placebo-controlled trials evaluating adult women with HPV 16/18 positive biopsy-proven cervical HSIL (CIN 2/3). The primary endpoint is regression of cervical HSIL and virologic clearance of HPV-16 and/or HPV-18 in the cervix, which was a secondary endpoint that was achieved in our Phase 2b trial described above. Overall, the Phase 3 studies are evaluating cervical tissue changes at approximately 9 months after beginning a three-dose regimen of VGX-3100 administered at months 0, 1 and 3.

In May 2019, VGX-3100 was granted an Advanced Therapy Medicinal Product Certificate by the European Medicines Agency (EMA), for quality and non-clinical data. The procedure of certification of quality and non-clinical data involves an assessment of the available data in view of future registration and the related European Scientific Data Requirements, not including any clinical data or benefit-risk assessment. The granted EMA's certificate confirms that our chemistry, manufacturing and controls (CMC) data and nonclinical results available to date overall comply with the scientific and technical standards for evaluating an EU Marketing Authorization.

In March 2021, we announced that VGX-3100 had achieved the primary and secondary endpoints among all evaluable subjects (modified intention to treat (mITT) population) for the REVEAL 1 trial. The trial protocol-defined mITT population (N=193) includes all subjects with endpoint data. For the primary endpoint of histopathological regression of HSIL combined with virologic clearance of HPV-16 and/or HPV-18 at week 36, the percentage of responders was 23.7% (31/131) in the treatment group, versus 11.3% (7/62) in the placebo group (p=0.022; 95%CI: 0.4,22.5), thus achieving statistical significance.

All secondary efficacy endpoints were achieved. These endpoints were: a) regression of cervical HSIL to normal tissue combined with HPV16/18 viral clearance, b) regression of cervical HSIL alone, c) regression of cervical HSIL to normal tissue, and d) HPV 16/18 viral clearance alone.

The trial protocol-defined intention to treat (ITT) population (N=201) includes all randomized subjects regardless of availability of endpoint data, and defines those without endpoint data as non-responders. There were eight such subjects (seven in the treatment group, one in the placebo group). Including subjects with missing endpoint data, the percentage of subjects meeting the primary endpoint was 22.5% (31/138) in the treatment group, versus 11.1% (7/63) in the placebo group (p=0.029; 95%CI: -0.4,21.2), which was not statistically significant. All secondary endpoints were achieved except for regression of cervical HSIL alone (95%CI: -0.6,24.5). The reasons for missing endpoint data were: one subject was randomized but was never dosed, one withdrawal due to pregnancy, one withdrawal due to administration error, one withdrawal due to post-administration pain, one loss of follow-up due to COVID19-related travel restrictions, and three losses to follow up due to undetermined reasons. A pre-specified per-protocol (PP) analysis will also be performed upon trial completion.

There were no treatment-related serious adverse events and most adverse events were self-resolving and were considered to be mild to moderate, consistent with earlier clinical trials.

We will continue to follow subjects in the REVEAL1 trial for safety and durability of response for 18 months following the last administration. We expect to present full data from REVEAL 1 at an upcoming scientific meeting.

Enrollment for the confirmatory REVEAL 2 trial is ongoing.

VGX-3100 for the Treatment of Vulvar HSIL

Precancerous lesions of the vulva, or vulvar HSIL, has less than a 5% rate of spontaneous or natural regression and there are no FDA-approved non-surgical treatments. Surgery, the most common treatment, is associated with high rates of disease recurrence and can cause disfigurement, long-term pain, and psychological distress for the women who undergo the procedure. Vulvar HSIL recurs in approximately one of every two patients who undergo surgical treatment.

In April 2017, we commenced an open label Phase 2 trial to evaluate the efficacy of VGX-3100 in patients with vulvar HSIL. This randomized, open-label Phase 2 clinical trial will assess the efficacy of VGX-3100 in 33 women with vulvar HSIL. VGX-3100 is administered with our CELLECTRA® intramuscular delivery smart device. The primary endpoint of the study is histologic clearance of high-grade lesions and virologic clearance of the HPV virus in vulvar tissue samples. The study will also evaluate the safety and tolerability of VGX-3100.

In January 2021, we announced positive efficacy results for the Phase 2 trial. A 25% or more reduction in HPV-16/18-associated vulvar HSIL was observed for 63% of trial participants (12 of 19) treated with VGX-3100 at six months post-treatment. Three out of the 20 participants with histology data (15%) resolved their vulvar HSIL and had no HPV-16/18 virus detectable in the healed area. By comparison, the spontaneous resolution of vulvar HSIL caused by HPV-16/18 is estimated to be only 2%. VGX-3100 was well-tolerated in the Phase 2 trial.

We plan to pursue a registrational Phase 3 clinical trial for HPV-16/18-associated vulvar dysplasia as well as to apply for rare and orphan disease designation for this indication.

VGX-3100 for the Treatment of Anal or Perianal HSIL

Left untreated, anal HSIL may progress to cancer. Spontaneous regression of anal HSIL may occur, but only in the range of 20% to 29% of patients after one year of follow-up. Persistent infection with a high-risk HPV genotype is responsible for a large portion of anal cancer. In the United States, about 55% to 80% of anal HSIL cases are associated with HPV-16/18, and worldwide about 80% of anal HSIL cases are associated with HPV-16/18. In the United States, over 90% of anal cancer is attributable to HPV, and about 87% of those HPV anal cancers are attributable to HPV-16/18 specifically.

There are no validated screening tests or a general screening recommendation consensus for anal HSIL. Treatment usually consists of repeated ablation, most commonly radiofrequency ablation (RFA), resections or laser therapy. However, treatment of anal HSIL represents a significant unmet medical need due primarily to the high recurrence rates up to 49% one year after treatment.

In May 2018, we commenced a Phase 2 clinical trial to evaluate VGX-3100 in patients who are HIV-negative with histologically confirmed anal or perianal HSIL, or anal intraepithelial neoplasia (AIN), associated with HPV-16 and/or HPV-18. The open-label trial enrolled 24 patients who received 3 doses of VGX-3100 delivered by our intramuscular CELLECTRA® device. The primary endpoint of the study was histologic clearance of the high-grade lesions and virologic clearance of the HPV-16/18 virus in anal/perianal tissue samples.

In August 2018, in partnership with the AIDS Malignancy Consortium (AMC), we commenced a Phase 2 clinical trial to evaluate VGX-3100 in patients who are HIV-positive with histologically confirmed anal or perianal HSIL associated with HPV-16 and/or HPV-18. The open-label single-arm trial will enroll approximately 75 patients who will receive 4 doses of

VGX-3100 delivered by our intramuscular CELLECTRA® smart device. The primary endpoint of the study was histological regression of high-grade anal lesions to low-grade or normal. The trial was fully funded by AMC.

In December 2020, we announced positive Phase 2 efficacy results demonstrating that VGX-3100 showed resolution of HPV-16/18-associated precancerous anal lesions (HSIL) in 50% (11 of 22) of subjects six months following the start of treatment. VGX-3100 was well-tolerated in this trial

INOVIO plans to pursue a registrational Phase 3 clinical trial for HPV-16-/18-associated anal dysplasia as well as to apply for rare and orphan disease designation for this indication.

VGX-3100 Immune Correlates and Biomarker Signatures

In November 2017, we announced that a post-hoc analysis of data generated from our Phase 2b trial of VGX-3100 identified immune correlates and biomarker signatures that were predictive of potential treatment success. Details of the new biomarker and immunologic data are highlighted in the peer-reviewed journal *Clinical Cancer Research* in the article, "Clinical and Immunologic Biomarkers for Histologic Regression of High-grade Cervical Dysplasia and Clearance of HPV-16 and HPV-18 after Immunotherapy," by us and our academic collaborators.

In May 2019, we entered into a collaboration with QIAGEN N.V. to co-develop a liquid biopsy-based companion diagnostic for the related immune correlates and biomarker signatures to identify patients most likely to respond to VGX-3100.

In February 2021, we announced an extension of our partnership with QIAGEN with a new master collaboration agreement to develop liquid biopsy-based companion* diagnostic products based on next-generation sequencing technology to complement INOVIO's therapies.

The initial project in this expanded collaboration focuses on the co-development of a diagnostic test that identifies women who are most likely to benefit from clinical use of VGX-3100. QIAGEN's bioinformatic expertise will further increase the predictive power of INOVIO's preliminary biomarker signature – and the assay will now be developed for use on the Illumina NextSeq™ 550Dx platform, the first development based on a partnership QIAGEN and Illumina signed in October 2019.

ApolloBio Collaboration Agreement for VGX-3100 within Greater China

In December 2017, we entered into an amended agreement providing ApolloBio Corporation with the exclusive right to develop and commercialize VGX-3100 within Greater China (defined as China, Hong Kong, Macao and Taiwan). Additional details on the ApolloBio Agreement are provided below under "Business-License, Collaboration and Supply Agreements."

Upon the closing of the transaction in March 2018, we received proceeds of $19.4 million which comprised the upfront payment of $23.0 million less $2.2 million in foreign income taxes and $1.4 million in certain foreign non-income taxes. We may also receive potential milestone payments of up to $20 million in the aggregate. In addition, we are entitled to receive double-digit tiered royalty payments on sales. This collaboration of VGX-3100 encompasses the treatment and/or prevention of precancerous HPV infections and HPV-driven dysplasias (including cervical, vulvar and anal precancers) and excludes HPV-driven cancers and all combinations of VGX-3100 with other immunostimulants. The agreement also provides for potential inclusion of the Republic of Korea during the first three years of the term of the agreement.

INO-3107 for the Treatment of Recurrent Respiratory Papillomatosis (RRP)

RRP is a rare disease (estimated at 15,000 active cases in the United States, including both juvenile and adult cases) that is characterized by the growth of tumors in the respiratory tract primarily caused by HPV-6 and/or HPV-11 genotypes. Although limited, the published epidemiologic data on RRP suggest this disease occurs worldwide. Although benign, papillomas can cause severe, sometimes life-threatening airway obstruction and respiratory complications. A distinguishing aspect of this disease is the tendency for the papilloma to recur after surgical procedures to remove them. If RRP develops in the lungs, affected individuals can potentially experience recurrent pneumonia, chronic lung disease (bronchiectasis) and, ultimately, progressive pulmonary failure. In extremely rare cases (less than 1%), RRP can develop into squamous cell carcinoma. Additional symptoms of RRP can include hoarse voice, difficulty in sleeping and swallowing, and chronic coughing. RRP symptoms are usually more severe in children than in adults. In children, the disorder is most often diagnosed at or around the age of four years. In adults, the disorder occurs most often in the third or fourth decade, though evidence exists for some incidence of new diagnoses in the sixth decade.

In February 2020, we announced the publication of clinical data from a pilot clinical study of a DNA medicine candidate (INO-3107) targeting HPV 6-associated RRP in the scientific journal *Vaccines (MDPI)*. Study results demonstrated that the candidate generated immunogenicity and engagement and expansion of an HPV 6-specific cellular response, including cytotoxic T cells. Two out of two patients receiving treatment who previously required approximately two surgeries per year for several years to manage this disease delayed their need for surgery, with one patient able to delay surgery for over a year and a half (584 days surgery-free) and the second remaining surgery-free for over two and a half years (915 days surgery-free).

In February 2020, we commenced an open-label, multicenter Phase 1/2 trial that plans to enroll up to approximately 63 subjects in the United States and will evaluate the efficacy, safety, tolerability and immunogenicity of INO-3107 in subjects

with HPV-6 and/or HPV-11-associated RRP who have required at least two surgical interventions per year for the past three years for the removal of associated papilloma(s). For this study, adult subjects will first undergo surgical removal of their papilloma(s) and then receive four doses of INO-3107, one every three weeks. The primary efficacy endpoint will be a doubling or more in the time between surgical interventions following the first dose of INO-3107 relative to the frequency prior to study therapy. If we obtain sufficient safety and potential efficacy data in adults, we plan to expand the trial to include pediatric patients as well as a potential booster regimen.

In July 2020, we announced that the FDA granted orphan drug designation for INO-3107. Orphan drug designation is intended to advance drug development for rare diseases. FDA grants orphan drug status to medicines intended for the prevention, diagnosis, and treatment of rare diseases or conditions. In the United States, an orphan disease is defined as a disease or condition with a prevalence of less than 200,000 patients in the United States annually. This orphan drug designation from the FDA qualifies INO-3107 for various development incentives, including a tax credit on expenditures incurred in clinical studies, a waiver of the New Drug Application (NDA) fee, research grant awarded by the FDA, and potentially up to seven years of U.S. market exclusivity upon approval for the treatment of RRP.

In November 2020, we announced the dosing of the first subject with INO-3107 in a Phase 1/2 clinical trial for the treatment of RRP. Patient recruitment is ongoing.

MEDI0457 (VGX-3100 + INO-9012) for the Treatment of HPV-Associated Cancers

Overview and Background

HPV is also associated with some head and neck cancers, especially those in the oropharynx and perhaps to some extent the larynx and oral cavity. The incidence of HPV-caused oropharyngeal squamous cell cancer (OPSCC) has increased significantly within the last 30 years in the United States, including a 225% increase from 1988 to 2004, an average annual increase of 14%. More recently, from 1999 to 2015, HPV-associated OPSCC incidence in the United States increased among men at an annual average rate of 2.7% and among women at an annual average rate of 0.8%, and by approximately 2009 the incidence of these HPV-associated mouth and throat cancers in men exceeded that of cervical cancers in women. Oropharyngeal cancer is the fastest-rising cancer among young white men in the United States, and U.S. men in general are about four times more likely than women to be diagnosed with HPV-associated oropharynx cancer. Increasing trends of the cancer in the United States are projected to continue at least through the year 2030. The estimated U.S. prevalence of HPV-caused oral cavity and pharynx cancer was approximately 108,000 cases in 2015.

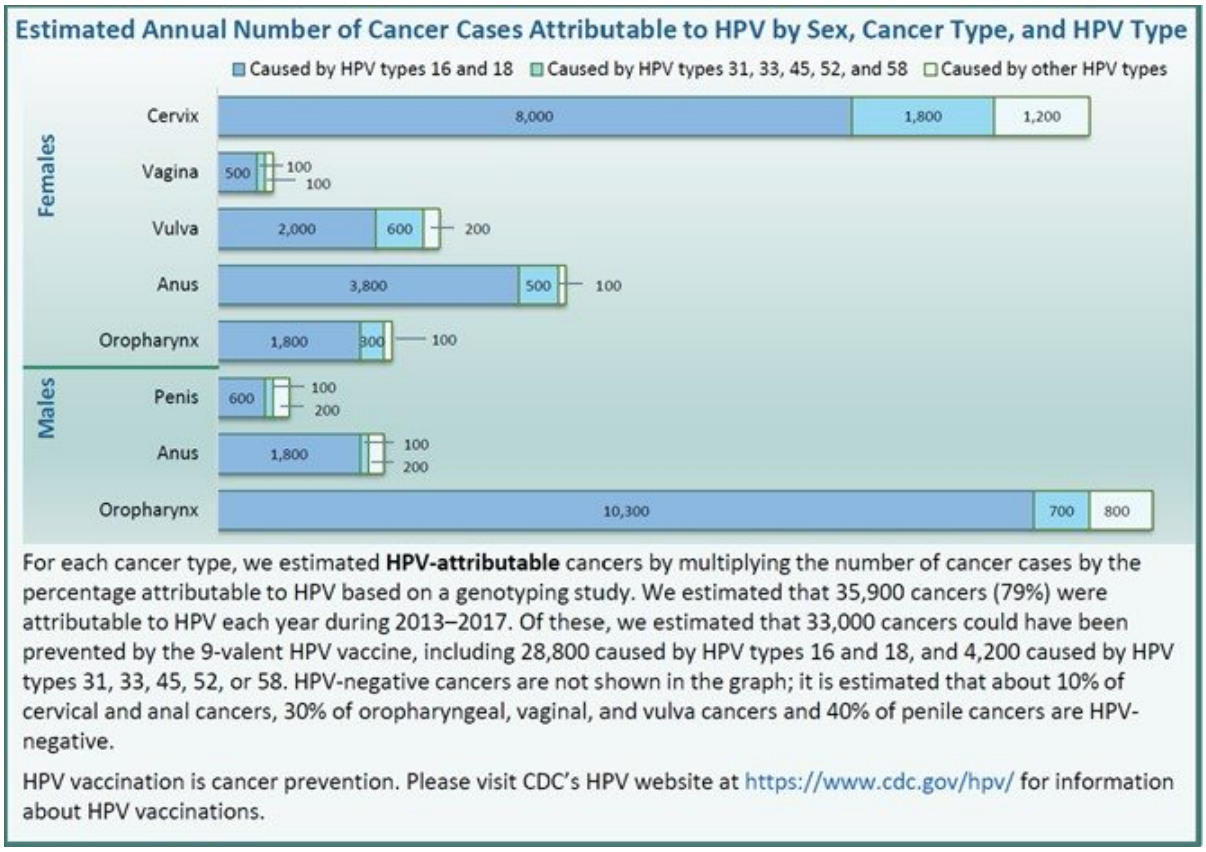
OPSCC is the most common HPV-attributable cancer in the United States. An estimated 14,000 new cases were diagnosed annually from 2013 to 2017 on average, with about 75% of those cases being among men. Worldwide, an estimated 98,412 new cases of oropharyngeal cancer overall occurred in 2020, and about 21% of those cases per year of this cancer are HPV- attributable.

Scientists have estimated that by 2030 OPSCC will constitute the majority of all head & neck cancers. In the U.S., about 70% of cancers of the oropharynx are now caused by HPV, with HPV-16 being the most prevalent genotype and causing about 86% of those HPV-caused cancers. The U.S. incidence rate of this cancer is projected to continue its exponential growth and reach 31,000 new annual cases by 2029.

Improvements in primary treatment modalities (surgery and radiation) have produced significant improvements in morbidity, but intensive radiation has a profound long-term impact on mortality and quality of life. Based on these factors, we believe there is a significant opportunity for an effective immunotherapy.

Considering the several known cancers caused by HPV, the relative and total burden of those in terms of the annual U.S. average annual incidence rates and portions attributable to the HPV-16/18 genotypes for the period from 2013 to 2017 (the latest time period for which such HPV association and attribution data are available) are shown in the following figure. In total for that period, an average of nearly 36,000 cases of HPV-attributable cancers per year were diagnosed in the United States, and 80% of those per year were specifically due to HPV-16/18 genotypes.

Annual Incidence of HPV-Attributable Invasive Cancers by Site in the United States, 2013 - 2017



Worldwide data estimates of the HPV-attributable fractions of HPV-associated cancers are shown in the following table.

Annual Incidence of HPV-Attributable Cancers by Site Worldwide

Preventable fraction of human papillomavirus (HPV)-related cancer cases per year

HPV-related cancer site	Incident cases, No.*	Cases attributable to HPV, No.	Nine HPV types, %	Cases attributable to HPV, No.	Nine HPV types, %
Cervix uteri	530 000	405 450†	76.5†	477 000‡	90.0‡
Anus	40 000	31 600	79.0	31 600	79.0
Vulva	34 000	7752	22.8	7752	22.8
Vagina	15 000	9105	60.7	9105	60.7
Penis	26 000	6370	24.5	6370	24.5
Oropharynx	96 000	20 448	21.3	20 448	21.3
Oral cavity	200 000	8000	4.0	8000	4.0
Larynx	160 000	4320	2.7	4320	2.7
Total HPV-related sites	1 101 000	493 045		564 595	
Potentially preventable cases, %		44.8%		51.3%	

*Source: de Martel, 2017
†Assumption: 85% HPV DNA-positivity and 90% relative contribution (RC) of nine HPV types.
‡Assumption: HPV is a necessary cause of invasive cervical cancer; and 90% RC of nine HPV types.

MEDI0457 for the Treatment of Head & Neck Cancer

In 2014, we initiated a Phase 1 clinical trial assessing the immunogenicity and safety of our product candidate INO-3112 (consisting of a combination of VGX-3100 and our product candidate INO-9012) in head & neck cancer patients. INO-3112 is now called MEDI0457, following our collaboration with AstraZeneca, described below. We added INO-9012, a DNA-based IL-12 immune activator, to VGX-3100 for this cancer study because our prior HIV vaccine clinical study had indicated that the addition of IL-12 to our DNA medicine could enhance the activation of CD8+ T cells.

We enrolled 22 adults with HPV16 and/or HPV18-positive HNSCC in this open-label Phase 1 trial. Patients were treated with four doses of MEDI0457 and then followed for safety, immune and clinical responses. In one part of the study, six patients were treated once with MEDI0457 before and after resection of their tumor. These patients received three additional doses subsequent to surgery and chemoradiation therapies. In the second part of the study, 16 patients were recruited into the study after their surgery and completion of chemotherapy and radiation therapy. These patients were treated with four doses of MEDI0457 and followed. Each MEDI0457 treatment was administered using our CELLECTRA® smart delivery system.

In 2016, at the Annual Meeting of the Society for Immunotherapy of Cancer (SITC), we reported interim immunology results showing that in the group of six patients treated before resection (one dose averaging 14 days and ranging 7 to 28 days prior to definitive surgery) and post-surgery (three additional doses), MEDI0457 generated robust HPV16/18 specific CD8+ T cell responses in peripheral blood in four of five subjects who also showed increased T cell activation in resected tumor tissue samples. One subject withdrew consent after surgery, leaving five evaluable subjects in this group.

In October 2018, we announced a paper published in *Clinical Cancer Research*, a major cancer journal, detailing results of a patient with head and neck cancer treated with MEDI0457 who achieved a sustained complete response (full remission) on treatment with a subsequent PD-1 checkpoint inhibitor. In our sponsored study of 22 patients with head and neck squamous cell carcinoma we reported 91% (20/22) showed T cell activity in the blood or tissue.

In January 2019, we announced that a second patient with HPV-associated head and neck cancer treated with MEDI0457 in the Phase 1 trial achieved a sustained complete response (full remission) after subsequent treatment with a PD-1 checkpoint inhibitor.

Both patients who achieved full cancer remission were treated with four doses of MEDI0457. This response indicates that MEDI0457 generated robust HPV-16/18 specific CD8+ T cell responses in peripheral blood and increased CD8+ T cell infiltration in resected tumor tissue samples.

Of the four patients who developed progressive disease and were subsequently administered a PD-1 checkpoint inhibitor, two patients rapidly exhibited a complete response. The most recent patient for which data was presented in January 2019 received pembrolizumab (KEYTRUDA®), while the previously reported complete responder was treated with nivolumab (OPDIVO®). The patients moved from metastatic head and neck cancer to no evidence of disease and they remain alive two years after treatment.

Increasing evidence suggests that response rates from checkpoint inhibitors can be enhanced when used in combination with cancer vaccines like MEDI0457 that generate tumor-specific T cells. Interim data from a MEDI0457 monotherapy study of head and neck cancer patients demonstrated that MEDI0457 generated robust HPV-16/18 specific CD8+ T cell responses in peripheral blood and increased CD8+ T cell infiltration in resected tumor tissue samples.

Collaboration with AstraZeneca

In 2015, we formed a strategic collaboration with AstraZeneca focused on cancer immunotherapies. Under this agreement AstraZeneca licensed INO-3112 (renamed MEDI0457), to be studied in combination with selected immunotherapy molecules within its pipeline in HPV-associated cancers. See "Business-License, Collaboration and Supply Agreements" for additional information about the collaboration agreement.

In 2017, we announced that AstraZeneca will conduct a Phase 1/2 clinical trial investigating the combination of MEDI0457 and durvalumab, a PD-L1 checkpoint inhibitor. The combination trial will enroll patients with metastatic HPV-associated HNSCC with persistent or recurrent disease after chemotherapy treatment.

The open-label clinical trial is evaluating the safety and efficacy of the combination therapy in 35 subjects with metastatic head and neck cancer at multiple U.S. sites. Subjects will receive multiple doses of MEDI0457 and durvalumab. The primary endpoints of the trial are safety and objective response rate. The trial will also evaluate immunological impact, progression-free survival and overall survival. The Phase 2 portion of this study was initiated in December 2017, and this initiation triggered a $7 million milestone payment from AstraZeneca to us.

In December 2018, we announced the dosing of the first patient in an open-label, Phase 2 combination trial to evaluate MEDI0457, in combination with durvalumab, in patients with HPV-associated cervical, anal, penile and vulvar cancers. This trial, which is being funded by AstraZeneca, has an estimated total enrollment of 77 patients.

The first dosing of a cervical cancer patient in this trial resulted in an additional $2.0 million milestone payment from AstraZeneca to us in 2018. A first dosing of a patient with a third distinct HPV-associated cancers other than H&N or cervical triggered another $2.0 million milestone payment in April 2019.

Under our collaboration agreement, AstraZeneca will fund all of the costs of developing MEDI0457.

INO-5151 (INO-5150 + INO-9012) for the Treatment of Prostate Cancer

In the United States in 2021, there will be an estimated 248,530 new cases of prostate cancer and more than 34,000 deaths due to this cancer. Worldwide in 2020, an estimated 1.41 million new cases of and nearly 375,000 deaths occurred due to this cancer. IARC projects that in year 2040, about 2.24 million new cases will occur.

In 2015, we initiated a Phase 1 trial to evaluate our DNA immunotherapy for prostate cancer, INO-5150, in men with biochemically relapsed prostate cancer. This study is evaluating the safety, tolerability and immunogenicity of INO-5150 alone or in combination with INO-9012 (DNA vector expressing interleukin 12). The multi-centered study is also evaluating changes in prostate specific antigen, or PSA, levels, an important biomarker in prostate cancer. We have fully enrolled 62 patients in the trial across four dose cohorts.

An interim data analysis presented in 2017 at the European Society of Medical Oncology (ESMO) meeting in Madrid, Spain showed that INO-5150 had generated antigen-specific CD8+ killer T cell responses measured in peripheral blood from subjects with biochemically recurrent prostate cancer. Treatment with INO-5150 as a monotherapy generated PSA and prostate specific membrane antigen, or PSMA, specific T cell responses in peripheral blood in 60% (35/58) of the subjects. Patients with specific CD8+ T cell responses experienced dampening in the rise of PSA and significant increases in Prostate Specfic Antigen Doubling Times (PSADT).

In June 2018, additional prostate cancer data from the trial was presented at the American Society of Clinical Oncology (ASCO) annual meeting. The additional data showed clinically meaningful PSA stabilization after administration of INO-5150 in patients, with no documented disease progression during the study. Of note, this effect was also observed in the patients with the fastest PSADT at the time of study entry.

In October 2018, we announced new data from the trial in which a slowing of PSADT was observed in men with prostate cancer. Eighty-six percent (86%) of patients remained progression-free at Week 72 of the study, and immunogenicity was observed in 77% (47/61) of patients by multiple immunologic assessments. These data were presented at the 2018 European Society for Medical Oncology (ESMO) congress.

In July 2019, we announced a clinical collaboration agreement with Parker Institute for Cancer Immunotherapy (PICI) and the Cancer Research Institute (CRI) in which INO-5151 will be combined with an immune modulator (CDX-301, FLT3 ligand, a dendritic cell mobilizer) and a PD-1 checkpoint inhibitor (nivolumab) targeting metastatic castration resistant prostate cancer (mCRPC) in a PICI sponsored platform study. INO-5151 is a combined formulation of INO-5150 (with SynCon® antigens encoding for PSA and PSMA) and INO-9012.

This combination trial is an open-label, non-randomized, exploratory platform study designed to assess the safety and antitumor activity of multiple immunotherapy based combinations in participants with mCRPC who have received prior secondary androgen inhibition. This study will evaluate biomarkers of immune activity and clinical outcomes using a multi-omic, multi-parameter approach. Our immunotherapy is one arm (Cohort C) of this broad PICI-supported study, which is a multi-arm, multi-stage platform design.

Under the agreement, PICI will design and execute the clinical study, working in collaboration with its established network of the most pre-eminent clinical academic and industry cancer centers, and with funding support from CRI. Based on PICI's novel approach to accelerating studies of cancer immunotherapies, we will provide financial contributions based on the actual costs of the study, if our product(s) studied under the collaboration reaches the initiation of a Phase 3 study.

The clinical trial is currently enrolling.

INO-5401 for the Treatment of Glioblastoma Multiforme (GBM)

Glioblastoma (GBM) is the most common and aggressive type of brain cancer. The median age at diagnosis is 65 years, and the incidence rate increases with age to the maximum being in the group age 75-84 years. Its prognosis is extremely poor, despite a limited number of new therapies approved over the last 10 years. From 2013 to 2017 the median overall survival for patients receiving standard of care therapy was approximately 8 months and the five-year survival was 7.2%. 3-year survival has recently been estimated to be 10.5% from data of the 2004 to 2013 period.

In the United States, a recently published analysis of data from the 2013 – 2017 period found an estimated annual GBM incidence of 12,000 cases and projected incidence of 12,800 cases for the year 2020 and nearly 13,000 cases for the year 2021.

Our product candidate INO-5401 is an immunotherapy consisting of three tumor-associated antigens: hTERT, Wilms' tumor gene (WT1) and PSMA. The National Cancer Institute previously highlighted WT1, hTERT and PSMA among a list of attractive cancer antigens, designating them as high priorities for cancer immunotherapy development. WT1 was at the top of the list. The hTERT antigen relates to 85% of cancers and WT1 and PSMA antigens are also widely prevalent in many cancers.

In 2017, we reported data indicating that our SynCon® WT1 cancer antigen was capable of breaking immune tolerance, a major challenge to researchers striving to develop potent cancer therapies, and induced neo-antigen-like T cell responses to cause tumor regression in pre-clinical studies. The results were published in the scientific journal *Molecular Therapy*.

While mice in the preclinical study did not mount an immune response to native mouse WT1 antigens, mice immunized with our SynCon® WT1 antigen broke tolerance and generated robust neo-antigen-like T cells. The immunized mice also exhibited smaller tumors and prolonged survival in a tumor challenge study. SynCon® WT1 DNA vaccination also broke tolerance and generated neo-antigen-like T cell immune responses in Rhesus monkeys, a species whose immune system closely resembles that of humans. The ability to overcome the immune system’s usual tolerance of WT1 antigen suggests the potential of our SynCon® WT1 antigen to tackle any WT1-expressing cancer in humans, including pancreatic, brain, lung, thyroid, breast, testicular, ovarian, and melanoma.

We previously reported similar results for our SynCon® hTERT and PSMA cancer antigens.

These attributes of breaking tolerance and having broader prevalence across different cancers create the potential for INO-5401 to be an effective universal cancer immunotherapy in combination with different checkpoint inhibitors.

In June 2018, we dosed the first patient as part of a Phase 1/2 immuno-oncology trial in patients with newly diagnosed GBM. The trial is designed to evaluate INO-5401 and INO-9012, in combination with cemiplimab (Libtayo®), a PD-1 inhibitor developed jointly by Regeneron Pharmaceuticals and Sanofi.

The open-label Phase 2 trial of 50 newly diagnosed GBM patients is being conducted at approximately 25 U.S. sites, and the primary endpoint is safety and tolerability. The study will also evaluate immunological impact, progression-free survival and overall survival.

In November 2019, we provided interim results from the Phase 2 study. Key interim data from the 52-patient clinical trial showed that 80% (16 of 20) of MGMT gene promoter methylated patients and 75% (24 of 32) of unmethylated patients were progression-free at six months (PFS6) measured from the time of their first dose, substantially exceeding historical standard-of-care data.

This immunotherapy combination with a PD-1 checkpoint inhibitor also exhibited supportive safety, tolerability, and immunogenicity data and suggested a safety profile consistent with that of Libtayo® as well as our other product candidates. Most patients tested had a T cell immune response to one or more tumor-associated antigens encoded by INO-5401. Immune responses to all three tumor-associated antigens were demonstrated in this study.

In May 2020, we announced that 85% (44 out of 52) of the patients in the Phase 1/2 trial were alive for at least 12 months or more following treatment. The Phase 1/2 clinical trial demonstrated that 84.4% percent (27 of 32) of patients with MGMT promoter unmethylated tumors, and 85% (17 of 20) of patients with MGMT promoter methylated tumors were alive at 12 months. Activated, killer T cells directed towards all three cancer antigens in INO-5401 were detected in all patients tested to

date. INO-5401 + INO-9012 was well-tolerated when given not only with radiation and temozolomide, but also with PD-1 inhibition with Libtayo.

In November 2020, additional data from the Phase 1/2 study were presented at the Society for Neuro-Oncology (SNO) 2020 Annual Meeting. Survival data at 18 months showed that 70% (14/20) of MGMT promoter methylated GBM patients were alive, and 50% (16/32) of MGMT promoter unmethylated patients, which are the more difficult to treat group, were alive after 18 months. Median overall survival in the unmethylated GBM patients was 17.9 months, which compares favorably to historical controls. Median overall survival for methylated patients has not yet been reached and the study is ongoing.

Interim data demonstrated that in the MGMT promoter unmethylated cohort, 19/22 (86%) subjects had an IFN-gamma T cell response that increased over baseline to one or more of the antigens encoded by INO-5401. In the MGMT promoter methylated cohort, 16/17 (94%) subjects had an IFN-gamma response that increased over baseline to one or more of the antigens encoded by INO-5401.

Infectious Disease Product Candidates

Our product development platform also allows for rapid design, pre-clinical testing, manufacturing and clinical development of our vaccine and immunotherapy product candidates. In 2016, we were the first entity able to advance a Zika vaccine into human clinical trials, just 4.5 months after the World Health Organization, or WHO, declared the emerging Zika infections to be a Pandemic Health Emergency of International Concern. Previously, we led the development of the first MERS vaccine in human clinical trials. More recently, our DNA medicines platform and SynCon® sequencing capabilities allowed us to rapidly respond to the coronavirus outbreak of 2020. We believe that our development platform is well positioned to support global health agencies in order to develop preparedness countermeasures against bioterrorism and/or emerging pandemic agents.

INO-4800 for COVID-19

Background on COVID-19

A novel strain of coronavirus emerged in the human population in Wuhan City, China in November-December 2019. On December 31, 2019 the World Health Organization (WHO) China Office was informed of a number of pneumonia cases of unknown etiology appearing in the previous few days in Wuhan, China. On January 8, 2020, Chinese scientists announced the identification of a new Coronavirus associated with this pneumonia outbreak, and on January 11, they publicly shared the genetic sequence of that new virus. The new virus was temporarily referred to as “2019-nCoV” and “2019 novel coronavirus,” among other names, but subsequently was named SARS-CoV-2 due to the large similarity of its genetic sequence with that of the original severe acute respiratory syndrome coronavirus (SARS coronavirus or SARS-CoV). The new virus is a member of the genus of Coronaviruses, which is comprised of seven known viruses that can infect and make humans ill, including Middle East Respiratory Syndrome Coronavirus (MERS-CoV) and Severe Acute Respiratory Syndrome Coronavirus (SARS-CoV). This novel coronavirus is part of the Coronaviridae family of viruses that include the high risk viruses MERS-CoV and SARS-CoV, and four other lower risk coronaviruses which can cause the common cold. The disease caused by the SARS-CoV-2 novel coronavirus was subsequently named “COVID-19”.

During this emergence, on January 30, 2020 the WHO declared a Public Health Emergency of International Concern (PHEIC), and on March 11, 2020 the WHO declared this to be a pandemic. In the continued evolution of the pandemic since then, it has become clear that this is already one of the worst pandemics in recorded history, using the metric of the absolute number of caused deaths.

The virus quickly spread throughout China, Asia, and worldwide. As of February 2021, every country on earth has reported confirmed cases. A total of more than 100 million confirmed cases had been reported worldwide, with a total of nearly 2,300,000 reported deaths due to this disease, although the actual number of cases is far higher than the reported number.

The case-fatality ratio (aka case-fatality rate) for COVID-19 in the U.S. to date is about 0.60% in the United States, which is significantly lower than that of SARS (10%) and MERS (about 34%) but significantly higher than for seasonal influenza (0.1%). Estimates of the reproductive number (R_0), or the average number of persons one infected person in turn infects, of SARS-CoV-2 in populations largely before significant community, travel, and business restrictions (aka “lockdowns”) were implemented ranged from 2.2 to somewhat above 4.0, with an average of about 3.8. The R_0 for this novel coronavirus then appeared to be significantly higher than that of MERS-CoV (< 1.0) and the original SARS-CoV (about 2.0). It is the combination of the significant R_0, the significant case-fatality ratio, and the primary airborne transmission route of this respiratory disease that led to this new coronavirus and disease to become one of the most serious pandemics in modern history. Presently, several major variants of SARS-CoV-2 have evolved and spread significantly from several portions of the globe and quickly to many countries. Each of these major variants have the characteristics of at least having a significantly increased transmission rate with respect to the original/main SARS-CoV-2 strain. However, some also have or appear to be likely developing significantly diminished susceptibility to one or more of the emergency-use authorized vaccines. Further, evidence is emerging that at least one of the variants has possibly increased pathogenicity as measured by case-fatality.

Preclinical Development

In January 2020, CEPI awarded us a grant of up to $9 million to develop a vaccine against COVID-19. Our candidate, INO-4800 targets the major surface antigen Spike protein of SARS-CoV-2 virus, which causes COVID-19 disease.

In May 2020, we announced the publication of preclinical study data demonstrating robust neutralizing antibody and T cell immune responses against coronavirus SARS-CoV-2 in the peer-reviewed journal *Nature Communications*.

In the preclinical studies, INO-4800 demonstrated virus neutralizing activity using three separate neutralization assays testing the vaccine's ability to generate antibodies which can block virus infection by: 1) an assay using live SARS-CoV-2 viruses; 2) an assay using a pseudo-virus assay, where another virus displays the SARS-CoV-2 Spike protein; and, 3) a novel high-throughput surrogate neutralization assay measuring the ability of INO-4800-induced antibodies to block SARS-CoV-2 Spike binding to the host ACE2 receptor. Researchers also detected these antibodies in the lungs of the vaccinated animals which could be important in providing protection from SARS-CoV-2. In addition, high levels of Spike-specific T cell responses were observed with INO-4800 vaccination, which could be important in mediating protection from the virus infection.

In July 2020, we announced that INO-4800 was effective in protecting non-human primates (NHPs), specifically rhesus macaques, from live virus challenge 13 weeks after the last vaccination. These protective results were mediated by memory T and B cell immune responses from INO-4800 vaccination.

In these studies, INO-4800 reduced viral load in both the lower lungs and nasal passages in macaques that received two doses of INO-4800 (1 mg) four weeks apart and then were challenged with live virus 13 weeks after the second dose (study week 17). The reduced viral loads following exposure to SARS-CoV-2 infection at this timeframe demonstrated an important durable impact mediated by INO-4800. This is the first time a vaccine protection in non-human primates was reported from memory immune responses as previously reported monkey vaccine challenge studies were conducted at the time near their peak immune responses (1-4 weeks from their last vaccination).

INO-4800-treated animals demonstrated seroconversion after a single vaccination, with protective neutralizing antibodies and T cells lasting in their blood more than four months after the initial dose. The antibody levels were similar to or greater than those seen in patients who have recovered from COVID-19, and the T cell responses were significantly higher than those from convalescent patients.

Phase 1 Clinical Trial

In December 2020, we announced the publication of peer-reviewed Phase 1 clinical data from the first cohort of 40 participants for INO-4800. In this trial, INO-4800 was immunogenic in all vaccinated subjects, 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.

U.S. Phase 2/3 Clinical Trial – INNOVATE

In December 2020, we announced the dosing of the first subject in our Phase 2 clinical trial evaluating INO-4800, as part of our Phase 2/3 clinical trial, called INNOVATE (**IN**OVIO I**NO**-4800 **Va**ccine **T**rial for **E**fficacy). The Phase 2 segment of the trial has enrolled approximately 400 participants who are 18 years or older at up to 17 U.S. sites to evaluate safety and immunogenicity in order to confirm the dose(s) for the subsequent efficacy evaluation as part of the Phase 3 segment of the trial.

The Phase 2 segment of the 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 to confirm the more appropriate dosing level(s) for each of three age groups (18-50 years, 51-64 years and 65 years and older) at high risk of SARS-CoV-2 exposure for the subsequent Phase 3 efficacy evaluation.

The INNOVATE Phase 3 segment is planned as a randomized, blinded, placebo-controlled safety and efficacy evaluation of INO-4800 being conducted in adults 18 years and older. The INNOVATE trial is funded by the 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 INNOVATE, in addition to the $71.1 million of funding previously announced in June for the large-scale manufacture of CELLECTRA® 3PSP, production of doses and the procurement of CELLECTRA® 2000 devices.

INO-4800 in China

In December 2020, we announced the dosing of the first subject in our Phase 2 clinical trial of INO-4800 in China. The Phase 2 clinical trial being conducted in China is independent of the INNOVATE Phase 2/3 clinical trial of INO-4800 and will enroll approximately 640 participants who are 18 years or older. Our collaborator Advaccine is conducting and funding the Phase 2 trial in China.

The Phase 2 clinical trial of INO-4800 in China has enrolled both 18-59 years old adults and older adults (60 years and older) with the primary endpoints of evaluating safety and immunogenicity within the Chinese population. The dosing regimen involves two vaccinations at 0 and 28 days with either 1.0 mg or 2.0 mg dosing levels and is similar to the Phase 2 segment of the INNOVATE trial.

INO-4800 in South Korea

In June 2020, we announced a partnership with the International Vaccine Institute (IVI), and Seoul National University Hospital to start a Phase 1/2 clinical trial of INO-4800 in South Korea. The two-stage trial of INO-4800, the first clinical study of COVID-19 vaccine in Korea, will assess the safety, tolerability, and immunogenicity of INO-4800 in 40 healthy adults aged 19-50 years, and will further expand to enroll an additional 120 people aged 19-64 years. The trial is funded by CEPI through us and is supported by the Korea Center for Disease Control and Prevention/Korea National Institute of Health.

COVID-19 dMAb®

In December 2020, we announced that we along with a team of scientists from The Wistar Institute, AstraZeneca, the University of Pennsylvania, and Indiana University received a $37.6 million grant from the U.S. Defense Advanced Research Projects Agency (DARPA), a research and development agency of the DoD and the JPEO-CBRND, to use our dMAb technology to develop anti-SARS-CoV-2-specific dMAbs that function as both a therapeutic and preventive treatment for COVID-19. See “Synthetic DNA-based Monoclonal Antibodies Program” below for more information about our dMAb technology.

As part of DARPA's two-year grant, our and Wistar teams will construct COVID-19 dMAb® candidates mirroring AstraZeneca's traditional recombinant monoclonal antibody candidates currently being tested in clinical trials to treat COVID-19. These dMAb® candidates can be quickly developed and produced *in vivo*, offering a cost-effective and scalable therapeutic and preventive option for treatment of SARS-CoV-2 virus infection. The dMAb® candidates will then be advanced into preclinical studies and then into human clinical trials.

Global Manufacturing Consortium for INO-4800

In March 2020, we announced with Ology Bioservices Inc., a biologics contract development and manufacturing organization (CDMO), that the DoD awarded Ology Bioservices with a contract valued at $11.9 million to work with us on rapid manufacture DNA vaccines. This work is supported by the Office of the Assistant Secretary of Defense for Health Affairs with funding from the Defense Health Agency. Under this program, Ology Bioservices will work with us to manufacture INO-4800.

In March 2020, we received a $5 million grant from the Bill & Melinda Gates Foundation to accelerate the testing and scale up of CELLECTRA® 3PSP proprietary smart devices for the intradermal delivery of INO-4800.

In April 2020, we announced an agreement to expand our manufacturing partnership with the German contract manufacturer Richter-Helm BioLogics GmbH & Co. KG, to support large-scale manufacturing of INO-4800.

In September 2020, we announced that Thermo Fisher Scientific signed a letter of intent to manufacture INO-4800. Thermo Fisher plans to manufacture INO-4800 drug substance as well as perform fill and finish of INO-4800 drug product at its commercial facilities in the United States.

In December 2020, we announced the execution of an agreement with Kaneka Eurogentec S.A., an affiliate of Kaneka Corporation, for Eurogentec to manufacture INO-4800 at their GMP plasmid production scales.

COVID-19 Variants of Concern (VOC)

We have been closely monitoring the development and evolution of SARS-CoV-2, with a particular focus on the UK, South African and Brazilian variants of the virus. We are currently evaluating the impact of newly circulating strains of the SARS-CoV-2 virus on the immune profile of INO-4800 through an assessment of binding antibodies, neutralizing antibodies in both live and pseudo assays as well as assessing the impact of the INO-4800-generated T cell responses on these variants.

We are also developing next-generation, pan-COVID vaccine candidates, that could be tailored to the known and potentially the unknown SARS-CoV-2 variants. Using our SynCon® gene optimization algorithm to analyze the available sequence data from all existing circulating variants, we are seeking to create a synthetic SAR-CoV-2 spike protein gene design intended to protect against the known VOC as well the future unknown strains. Our DNA vaccines generate a balanced immune response, including T cell responses,which we believe could make our pan-COVID vaccine candidates less susceptible to changes in the genetic sequence of the virus. DNA vaccines can also be used for multiple boosts without being impacted by

anti-vector immunity or an increase in reactogenicity. Moreover, pre-clinical studies and clinical trials have shown that DNA vaccines could also be used to boost the initial immune responses generated by multiple other vaccine platforms.

INO-4700 for Middle East Respiratory Syndrome (MERS)

Background on MERS

The Middle East Respiratory Syndrome or MERS is a viral respiratory illness first reported in Saudi Arabia in 2012. MERS appears to have been transmitted from an animal reservoir to humans but human to human transmission has been confirmed. The virus for this disease belongs to the Coronaviradea family (or a coronavirus – MERS-CoV), and was not shown to be a communicable virus spreading in a sustained way in communities, but rather via rapid spread in the nosocomial setting, such as emergency rooms and/or hospitals without adherence to state-of-the-art infection control practices, which can result in outbreaks with many cases, including super-spreading events. Like the severe acute respiratory syndrome (SARS) outbreak in 2003 linked to another coronavirus (SARS-CoV-1), which made approximately 8,000 people ill and was fatal in nearly 10% of those cases, MERS-CoV appears to cause severe lung infections. However, the case-fatality rate (death rate) of MERS has typically been between 30% and 40%, which is significantly higher than that of SARS. While the SARS epidemic in 2003 killed 10% of those who became ill from the SARS virus, MERS has killed approximately 34% of people who people who became ill from the MERS virus from 2012 to January 2020. MERS differs in that it also causes rapid kidney failure. Its high death rate has caused serious concern among global health officials.

Despite the continuing threat of MERS outbreaks, there are no licensed vaccines or treatments for MERS. Since the virus was first identified in Saudi Arabia in 2012, the World Health Organization reports 2,519 laboratory-confirmed cases of MERS and 866 deaths from MERS worldwide as of January 2020. Twenty-seven countries have reported cases, including Korea where an outbreak in the summer of 2015 resulted in 186 cases and 38 deaths. The majority of MERS cases reported in the world by country have been reported from the Kingdom of Saudi Arabia, with a total of 2,121 cases, 788 associated deaths, and a case-fatality rate of 37% from 2012 through January 2020. Of those cases to date in Saudi Arabia, nearly 20% have been in healthcare workers.

Preclinical Development – MERS

In 2013, we announced that preclinical testing of our SynCon® MERS vaccine candidate, INO-4700 (also known as GLS-5300), had induced robust and durable immune responses in mice, demonstrating the potential for such a vaccine to prevent and treat this deadly virus. DNA medicine constructs targeting multiple MERS antigens were designed using our SynCon® vaccine platform with the goal to universally protect against multiple strains of MERS, which has been shown to have diverse genetic variants. These SynCon® constructs were administered via our CELLECTRA® smart delivery technology.

A consensus MERS "spike" protein vaccine construct was created based on multiple strains of the MERS virus.

In 2015, we announced that our MERS vaccine had induced 100% protection from a live virus challenge in a preclinical study in mice, camels and monkeys, or non-human primates. In all three species, the vaccine induced robust immune responses capable of preventing the virus from infecting cells. We believe the data from camels is an important finding because camels represent not only a host reservoir of the disease, but also act as a mode of transmission to humans. In monkeys, all vaccinated animals in the study were protected from symptoms of MERS disease when challenged with a live MERS virus.

The preclinical results appeared in the peer-reviewed journal *Science Translational Medicine*.

Clinical Development – MERS

In 2016, we and our collaborator GeneOne commenced a Phase 1, dose-escalation clinical trial of INO-4700 in 75 healthy volunteers at the Walter Reed Army Institute of Research (WRAIR) in Maryland. The primary and secondary goals of this Phase 1 trial are to obtain safety and immunogenicity data. This trial represents the first MERS vaccine to be tested in humans for this disease that has no approved vaccines or treatments.

In 2016, we announced that the International Vaccine Institute (IVI) will provide new funding and support to further advance the clinical development of INO-4700. IVI will add technical, laboratory and financial support for INO-4700 clinical trials in Korea with the goal to advance clinical testing toward emergency use authorization by the Korean government as well as authorities of other countries. This collaborative funding is part of a grant from the Samsung Foundation to IVI to support the development of a MERS vaccine for emergency use in Korea and internationally.

In April 2018, we announced a collaboration with CEPI under which we will develop vaccine candidates against MERS. CEPI will fund up to $56 million of costs to support our pre-clinical and clinical advancement through Phase 2 of INO-4700. The goal of the collaboration is for the MERS vaccine to be available as soon as possible for emergency use.

In June 2018, we announced positive results from the Phase 1 trial of INO-4700 for MERS. In the trial, treatment with INO-4700 was well tolerated and resulted in overall high levels of antibody responses in roughly 95% of subjects, while also generating broad-based T cell responses in nearly 90% of study participants. Antibody responses were observed in 94% of subjects at week 14 (two weeks after the third dose). Additionally, there were no statistically significant dose-dependent

differences in antibody response rates (91%, 95%, and 95% at doses of 0.67, 2, and 6 mg, respectively). Durable antibody responses were also maintained through 60 weeks following dosing. These results were published in The Lancet Infectious Diseases in a peer-reviewed article entitled, "Safety and immunogenicity of an anti-Middle East respiratory syndrome coronavirus DNA vaccine: A phase 1, open-label, single-arm, dose-escalation trial."

In September 2018, we announced the dosing of the first subject in a Phase 1/2a study of INO-4700 for MERS in South Korea funded by IVI.

In April 2020, we announced interim data through week 16 from a Phase 1/2a trial of DNA vaccine INO-4700. Vaccine recipients demonstrated strong antibody and T cell immune responses after 2 or 3 doses with 0.6 mg, delivered intradermally with our CELLECTRA® device. The vaccination regimen was well-tolerated with no vaccine-associated severe adverse events (SAEs). The researchers at the Wistar Institute, Seoul National University Hospital, and the International Vaccine Institute (IVI) collaborated on this study.

For those receiving 0.6 mg of INO-4700, 88% demonstrated seroconversion after a 2 dose regimen at 0 and 8 weeks, while for those receiving a 3 dose regimen given at 0, 4 and 12 weeks, 84% seroconverted after 2 doses and 100% after 3 doses, as measured by a binding antibody assay against the full-length S protein (ELISA). Additionally, 92% of the vaccine recipients in both groups displayed the ability to neutralize the virus using a pseudotype-based neutralization assay. Robust T cell responses were observed in 60% of vaccine recipients after the 2 dose regimen and 84% of those in the 3 dose group (ELISpot assay). A single dose of 0.6 mg of INO-4700 intradermal vaccination resulted in 74% binding antibody response rate and 48% neutralization antibody response rate.

INO-4212 for Ebola Virus Disease

Background on Ebola

The Ebola virus causes one of the most virulent viral diseases, with case fatality rates averaging 50% but approaching up to 90% in past outbreaks in areas with no or under-developed health care. Ebola can spread through human-to-human transmission by direct contact with the blood, secretions, organs or bodily fluids of an infected individual and with surfaces or materials that contain the contaminated fluids of an infected person, such as bedding and clothing. It is capable of causing death within two to twenty-one days of exposure. In November 2019, the first conditional approval was issued for a preventive vaccine against Ebola virus. This approval was from the EMA for the vaccine ERVEBO®. That same month, the WHO pre-qualified that vaccine for use in high-risk countries. In the next month, the FDA approved that vaccine. However, there are no proven effective therapeutic treatments for Ebola. In addition, various experimental approaches have already been associated with undesirable side effects and limited ability to scale manufacturing.

According to the CDC, the 2014 West Africa Ebola epidemic was the largest Ebola outbreak in world history, resulting in 28,610 suspected and confirmed cases and 11,308 deaths as of June 2016, when it was declared over.

In 2018, two Ebola outbreaks occurred, both in the Democratic Republic of Congo (DRC). The second Ebola outbreak of 2018 in the DRC became the second largest Ebola outbreak in world history. This particular outbreak had a 66% case-fatality ratio (aka case-fatality rate) as of February 2020. On June 1, 2020 an additional Ebola outbreak was declared in the DRC, before the outbreak was declared over on November 18, 2020.

Preclinical and Clinical Development - Ebola

In 2014, we entered into a collaboration with GeneOne to advance a DNA immunotherapy for Ebola into clinical development. The decision to advance our Ebola immunotherapy was based on positive results observed in preclinical studies, in which 100% of immunized guinea pigs and mice were protected from death after being exposed to the Ebola virus. Unlike the non-immunized animals, immunized animals were also protected from weight loss, a measure of morbidity. Researchers found significant increases in neutralizing antibody titers and strong and broad levels of immunotherapy-induced T cells, including "killer" T cells, suggesting that DNA immunotherapy could provide both preventive and treatment benefits. This data was published in 2013 in the peer-reviewed journal Molecular Therapy.

In 2015, we received a contract from DARPA to lead a consortium to develop multiple treatment and prevention approaches against Ebola. Other collaborators include AstraZeneca, GeneOne and David B. Weiner, Ph.D., a director of our company, who also serves as executive vice president at the Wistar Institute. A previous collaboration agreement with GeneOne for Ebola was incorporated into this consortium funded by DARPA.

We are taking a multi-faceted approach to develop products to prevent and treat Ebola infection. These programs include development and early clinical testing of:

- A therapeutic DNA-based monoclonal antibody product against the Ebola virus infection, which we believe has properties that best fit a response to the outbreak in that they could be designed and manufactured expediently on a large scale using common fermentation technology, are thermal-stable, and may provide more rapid therapeutic benefit;

- A highly potent conventional protein-based therapeutic monoclonal antibody (mAb) product against Ebola virus infection; and
- A DNA-based vaccine against Ebola.

Our contract with DARPA covers the pre-clinical development costs for the dMAb products and protein mAb candidates, as well as GMP manufacturing costs and the Phase 1 clinical trial costs for the three product candidates described above.

In 2015, we and our collaborators initiated a Phase 1 clinical trial of INO-4212, an Ebola DNA vaccine to evaluate its safety, tolerability and immune responses in 75 healthy subjects divided into five study arms. INO-4212 consists of two optimized SynCon® DNA plasmids coding for the Ebola glycoprotein antigen from circulating Ebola strains from 1975-2014. The study was designed to evaluate INO-4212 and its components, alone or in combination with our product candidate INO-9012, delivered into muscle or skin using our proprietary DNA smart delivery technology.

In 2016, we reported initial results from the trial. Of 69 evaluated subjects, 64 (92.8%) seroconverted and mounted a strong antibody response to the Ebola glycoprotein antigen following the three dose immunization regimen; 48 subjects (69.6%) seroconverted after only two doses.

In the study arm using intradermal (skin) administration, 13 of 13 evaluable subjects (100%) generated antigen-specific antibody responses after only two doses, and all remained seropositive after three immunizations. Similarly, in the study arm receiving the vaccine with intramuscular administration in combination with plasmid IL-12, 13 of 13 evaluable subjects (100%) produced strong antibody responses after three immunizations, and 12 of 13 (92.3%) achieved strong antibody responses after only two immunizations.

The Ebola glycoprotein specific geometric mean antibody titers measured in the five cohorts ranged from over 2,000 to greater than 46,000. Significantly, a majority of vaccinated subjects in each of the five cohorts produced strong Ebola antigen specific T cell responses as measured by interferon gamma ELISpot analysis.

INO-4212 was well tolerated, with no systemic serious adverse effects observed. Side effects, such as fever, joint pain, and low white blood cell counts have previously been reported following treatment with some viral vector based Ebola vaccines currently in development. Moreover, unlike the viral vectored vaccines which must be kept frozen, the INO-4212 formulation used in the trial was kept in a solution which was refrigerated at 2-8 degrees Celsius.

In 2016, we announced that enrollment of this study was being expanded to up to 200 subjects to further characterize and identify in humans the most optimal immunization regimen using intradermal (skin) delivery of the Ebola DNA vaccine.

In 2017, we reported preliminary results from the expanded Phase 1 trial. Across both stages of the trial, including both intramuscular and intradermal delivery, 95% (170/179) of evaluable subjects generated an Ebola-specific antibody immune response, with the mean antibody titer comparable or superior to those reported from viral vector-based Ebola vaccines. Our Ebola vaccine was also well tolerated in the second stages of the trial, with a favorable safety profile compared to viral vector-based Ebola vaccines, some of which have been associated with serious adverse events including myalgia, arthralgia, fever, and rash.

In October 2018, we announced that INO-4212 provided 100% protection following a challenge with a lethal dose of the Ebola virus in a preclinical study. An article in the *Journal of Infectious Diseases* highlighted that regimens of the INO-4212 vaccine delivered by intramuscular administration provided 100% protection against a lethal Ebola challenge in all preclinical animals. In a separate study, two injections by intradermal administration generated strong immunogenicity and provided 100% protection against a lethal Ebola challenge. In the study, scientists observed that vaccination induced long-term immune responses in monkeys that were detectable for at least one year after the final vaccination.

In March 2019, Phase 1 clinical data of our Ebola vaccine candidate INO-4201 was published in *The Journal of Infectious Diseases.* We believe that this study, which is being fully funded by DARPA, further supports the advancement of the intradermal delivery platform for emerging infectious diseases. Significantly, intradermal (skin) administration with our CELLECTRA® smart delivery device resulted in 100% of evaluable subjects in the study generating antigen-specific antibody responses that persisted for more than one year in most subjects and generated T cell responses equivalent to or better than the group that received intramuscular delivery. We believe these published data further validate the tolerability, potency, and product stability advantages of our vaccine and immunotherapy platform.

Our Ebola vaccine candidate was evaluated in five groups of healthy subjects. Of 70 evaluated subjects, 67 (96%) seroconverted and mounted a strong antibody response to the Ebola glycoprotein antigen following the three dose immunization regimen; 52 subjects (74%) seroconverted after only two doses.

In the study arm using intradermal (skin) administration, 13 of 13 evaluable subjects (100%) generated antigen-specific antibody responses after only two doses and all remained seropositive after three immunizations.

To date INO-4201 has been well-tolerated and has not demonstrated systemic serious adverse effects, such as fever, joint pain, and low white blood cell counts, reported in association with some viral vector-based Ebola vaccines currently in development.

INO-4500 for Lassa Fever

Background on Lassa Fever

Lassa fever, also known as Lassa hemorrhagic fever, is an acute viral disease which occurs mostly in West Africa. The disease can cause a range of outcomes including fever, vomiting, diarrhea, cough, and swelling of the face, pain in the muscles, chest, back and abdomen, bleeding of various parts of the body including the eyes and nose, vagina, and gastrointestinal tract, and death. Of the survivors of Lassa fever, about one-third have sudden-onset hearing loss, with more than half of those cases resulting in permanent hearing loss. This infection is spread through contact with infected rodents. Person to person transmission is also possible, via bodily fluids, albeit less common. Lassa virus infection in West Africa is estimated to affect 100,000 to 300,000 people annually, resulting in approximately 5,000 deaths, as disease and infection surveillance has been poor. Because of difficulties in diagnosing Lassa fever and the remoteness of many areas in which the disease occurs, the numbers of cases and deaths are likely significantly under-reported. Though the majority (about 80%) of Lassa virus-infected persons are asymptomatic or have mild symptoms, the infection can be quite serious to fatal in others. There are no licensed vaccines or treatments specifically for Lassa. The case-fatality ratio (aka case-fatality rate) (CFR) among patients hospitalized for Lassa fever is about 15% to 20%, and in some epidemics the CFR has reached 50% in hospitalized patients, such as in the 2015-2016 Nigeria portion of the West Africa outbreak. In lab confirmed cases in Nigeria from 2019 through 2020, the CFR was 21%. The CFR among pregnant women is particularly high, and in pregnant women infected with Lassa virus the fetal death rate due to spontaneous abortion rate is estimated to be about 95%.

Clinical Trials

In May 2019, we dosed our first patient in our Phase 1, first-in-human clinical trial to evaluate INO-4500, a DNA candidate vaccine to prevent infection from the Lassa virus. In 2019, we fully enrolled 60 volunteers in this placebo controlled, blinded, dose escalation study evaluating INO-4500 for safety, tolerability and immune responses. This trial represents the first Lassa candidate vaccine to enter the clinic. Our sponsored trial, as well as our INO-4500 program, is fully funded through the global partnership with CEPI that we entered into in April 2018.

If the results of this study are positive, we expect to advance INO-4500 into both Phase 1b and Phase 2 field trials in endemic countries of West Africa. If satisfactory Phase 2 data are achieved, CEPI, in cooperation with local regulatory authorities and the WHO, could elect to stockpile the vaccine for future use throughout the region.

Other Development Candidates

INO-1800 for the Treatment of Hepatitis B Virus

Although an effective preventive vaccine against hepatitis B virus, or HBV, infection has existed for over three decades, HBV remains a major epidemic, especially among people of Asian and African descent. The World Health Organization estimates that 2 billion people globally are or have been infected with HBV, with over 257 million people chronically infected with the virus and at risk of developing the major complications of cirrhosis or liver cancer. It is estimated that over two million people in the United States are chronically infected with the virus, including those who were foreign-born. Currently, the only therapies available for chronically infected individuals are interferon-alpha and nucleoside analog treatments, which function by controlling viral replication, but they do not clear infection. Interferon can prevent viral replication in only 30% of patients and does so with undesirable side effects.

Liver cancer is the fourth most common cause of death from cancer worldwide, and it kills the vast majority of patients within five years of diagnosis in the U.S. Approximately 900,000 new cases arose in 2020 worldwide. Liver cancer is estimated to have 42,230 new cases occur and kill more than 30,000 U.S. persons in 2021. One of the major causes and risk factors for liver cancer is infection by hepatitis B. Chronically infected individuals may develop a permanent scarring of the liver, a condition called cirrhosis. Liver cirrhosis can evolve into hepatocellular carcinoma, which claimed an estimated 830,000 lives worldwide in 2020.

INO-1800 is encoded for the HBcAg antigen and represents a consensus of the unique HBcAg DNA sequences of all major HBV genotypes (A through E). When delivered by CELLECTRA®, in a preclinical study, INO-1800 elicited strong HBcAg-specific T cell and antibody responses in the periphery (outside of the liver) as measured by ELISpot, ICS and cell proliferation assays. Researchers observed that the immunization could also induce antigen-specific CD8+ and CD4+ T cells that produced both IFN-y and TNF-a in the liver, indicating that a strong immunotherapy-induced T cell response was also present in the liver.

In the preclinical study, the antigen-specific T cells exhibited a killing function and were able to migrate to and stay in the liver and cause clearance of target cells without any evidence of liver injury. This was the first study to provide evidence that intramuscular immunization could induce killer T cells that can migrate to the liver and eliminate target cells.

In 2015, we initiated a Phase 1 trial to evaluate INO-1800 in patients chronically infected with HBV. This randomized, open-label, active-controlled, dose escalation study was designed to evaluate the safety, tolerability and immunogenicity of INO-1800 alone or in combination with INO-9012. This international study enrolled patients in the United States and Asia Pacific region with a primary endpoint of safety and tolerability of the therapy. Secondary endpoints are evaluating the cellular and humoral immune response to INO-1800 and its effect on several viral and antiviral parameters. All trial subjects are also medicated with standard-of-care antiviral therapies.

In March 2018, we announced interim results from the trial, in which INO-1800 was well-tolerated and generated virus-specific T cells, including CD8+ killer T cells, meeting the objectives of the clinical study. Preliminary immunology data from the trial revealed that treatment of patients with INO-1800 resulted in the generation of T cells that recognized key components of the hepatitis B virus and reacted by making antiviral cytokines such as Interferon gamma, a protein believed to be linked to clearance of HBV from the liver. In the trial, INO-1800 was also able to activate and expand CD8+ killer T cells that displayed markers believed to be important for retention in the liver as well as multiple potential mechanisms for killing virally infected cells.

We are currently seeking a collaboration partner in order to further advance the clinical development of INO-1800.

Synthetic DNA-based Monoclonal Antibody Programs

Background on recombinant Monoclonal Antibodies (mAbs)

Recombinant mAbs have become one of the most valuable therapeutic technologies of recent years. In 2020, global sales of mAbs exceeded $100 billion.

mAbs 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. They have the ability to alert the immune system to attack and kill specific cancer cells (as in the case of Yervoy®) or block certain biochemical pathways (such as those leading to rheumatoid arthritis, as in the case of Humira®). However, mAb technology has limitations. mAbs are manufactured outside the body and require costly large-scale laboratory development and production. Additional limitations include high cost to develop and manufacture, their limited duration of *in vivo* potency, and a pharmacokinetic profile that can result in toxicity. We have created DNA encoded monoclonal antibodies that we believe may overcome many of the limitations associated with conventional mAb technology.

Using our core platform technology, we insert the DNA sequence for a specific monoclonal antibody in a DNA plasmid. We deliver the plasmid directly into cells of the body using our CELLECTRA® smart delivery system, enabling the electroporated cells to manufacture those mAbs *in vivo*, - unlike conventional mAb technology that requires manufacture outside of the body. We believe this approach provides potentially significant advantages in terms of design simplicity, rapidity of execution and lower production costs.

We expect to design dMAb® product candidates not only for new disease targets not currently addressable with conventional recombinant mAbs, but also targets of existing, commercially available mAb products. We have already designed and produced dMAb product candidates targeting cancer mechanisms including checkpoint inhibition, anti-cancer pathways and anti-Tregs, as well as prophylactic and therapeutic dMAb product candidates for infectious diseases including Ebola, influenza, antibiotic resistant bacteria, dengue and Chikungunya.

Proof of Concept

Our first published research on a DNA-based monoclonal antibody was presented in October 2013 in the journal *Human Vaccines & Immunotherapeutics*. In a preclinical study, a single administration in mice of a highly optimized dMAb® HIV immunotherapy 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. In the study, this delivery strategy resulted in an increase in Fab levels in as little as 48 hours, when compared with protein-based immunization.

A second paper was published in July 2015 in *Scientific Reports,* a Nature Publishing Group journal. In this study, a single intramuscular injection of a DNA plasmid encoding a monoclonal antibody targeting dengue protected mice subsequently exposed to the dengue virus. The protection conferred by the monoclonal antibodies expressed by these dMAb product candidates was very rapid, with 100% survival in mice challenged with lethal enhanced dengue disease less than a week after dMAb administration. While conventional vaccine and monoclonal antibody technologies have shown limited ability to provide an effective solution to dengue to date, the unique attributes and data generated by dMAb immunotherapies show their potential to provide a needed solution. Furthermore, this short time frame to achieve full protection is significantly more rapid than vaccine-driven protection, which can take weeks to months to reach peak efficacy levels.

A paper published in March 2016 in *The Journal of Infectious Diseases* discussed the results of our preclinical study in which animals transfected with our DNA-based mAb targeting Chikungunya virus (CHIKV) exhibited the specific ability to bind to the CHIKV envelope antigen, and this serum possessed CHIKV-neutralizing activity. CHIKV is a serious mosquito-borne alpha-virus responsible for several recent epidemics in tropical Africa and Asia. In mid-2015, the CDC reported that suspected or confirmed cases of Chikungunya had reached 1.74 million in 45 countries or territories in the Americas. There is

currently no vaccine or therapeutic against this virus. In the study, the treatment of the animals with anti-CHIKV mAb plasmids protected 100% of the treated animals from a lethal injection of CHIKV virus while 100% of the control animals died. The treated animals were also spared virus-related morbidity, as measured by dramatic weight loss and lethargy.

Next Steps

In October 2014, DARPA awarded a $12.2 million grant to our scientists and those from the Perelman School of Medicine at the University of Pennsylvania and AstraZeneca in order to develop and assess dMAb product candidates in preclinical studies.

This collaboration aims to demonstrate that DNA plasmids can activate sufficient quantities of disease-specific monoclonal antibodies in the body to be protective against a pathogen challenge. Using the capabilities and advantages of DNA plasmids delivered using CELLECTRA®, the team is constructing and evaluating multiple dMAb product candidates focused on influenza virus and antibiotic resistant bacteria, such as Pseudomonas aeruginosa and Staphylococcus aureus.

In 2016, we expanded the collaboration to include The Wistar Institute after the collaborating investigator, Dr. David Weiner, a member of our board of directors, moved to the Institute.

Depending on the outcome of the preclinical studies, we and our collaborators may seek to advance a dMAb product candidate into clinical trials, if we are able to obtain additional governmental or non-governmental funding to do so.

As described above, in April 2015, we received a grant from DARPA to lead a consortium to develop multiple treatment and prevention approaches against Ebola. The aim of the research funded by this grant is to compare combinations of a DNA vaccine with conventional or DNA-based monoclonal antibodies.

In July 2016, we announced that our DNA-based monoclonal antibody technology will be deployed to develop product candidates which could be used alone and in combination with other immunotherapies in the pursuit of new ways to treat and potentially cure infection from HIV. Funding for this research is part of a $23 million grant from the National Institutes of Health to our collaborator, The Wistar Institute.

As described above, we have also received a 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.

In February 2019, we announced that in collaboration with The Wistar Institute and the University of Pennsylvania, the first subject was dosed as part of the first-ever human study of our dMAb technology. Funded fully by the Bill & Melinda Gates Foundation, this trial's focus is on the safety and tolerability of DNA plasmid encoding for a human anti-Zika antibody. This open-label trial is a single center, dose escalation trial that enrolled 24 healthy volunteers who received from one to four doses of INO-A002, inovio's DNA plasmid encoding for a human anti-Zika antibody. Doses ranges from 0.5 mg to 4 mg of plasmids injected per subjects, independent of their body weight.

As described above, we have received grant funding to develop anti-SARS-CoV-2-specific dMAbs® to function as both a therapeutic and preventive treatment for COVID-19.

License, Collaboration, Supply and Other Agreements

We have entered into various arrangements with corporate, academic, and government collaborators, licensors, licensees and others. These arrangements are summarized below.

Advaccine

In December 2020, we entered into a Collaboration and License Agreement (the "Agreement") with Advaccine. Under the terms of the Agreement, we have granted to Advaccine the exclusive right to develop, manufacture and commercialize our vaccine candidate INO-4800 within the territories of China, Taiwan, Hong Kong and Macau (referred to collectively as "Greater China"). Advaccine will not have the right to grant sublicenses, other than to affiliated entities, without our express prior written consent.

Under the Agreement, Advaccine has made an upfront payment to us of $3.0 million. In addition to the upfront payment, we are entitled to receive up to an aggregate of $108.0 million, payable upon the achievement of specified milestones related to the development, regulatory approval and commercialization of INO-4800, including the achievement of specified net sales thresholds for INO-4800 in Greater China, if approved. As of December 31, 2020, we have earned a $2.0 million milestone payment based on the enrollment of the first subject in the Phase 2 clinical trial for the product in the Advaccine territory. We are also entitled to receive a royalty equal to a high single-digit percentage of annual net sales in each region within Greater China, subject to reduction in the event of competition from biosimilar products in a particular region and in other specified circumstances. Advaccine's obligation to pay royalties will continue, on a licensed product-by-licensed product basis and region-by-region basis, for ten years after the first commercial sale in a particular region within Greater China or, if later, until the expiration of the last-to-expire patent covering a given licensed product in a given region.

Under the Agreement, Advaccine will be responsible for the development and commercialization of the licensed products at its own cost and expense and shall use commercially reasonable efforts to develop, obtain and maintain regulatory approval of INO-4800, as well as our CELLECTRA® device and arrays for use in connection with the administration of INO-4800, in each region in Greater China. In the event that we have not initiated the planned Phase 3 segment of our ongoing clinical trial of INO-4800 in the United States within one year after entering into the Agreement, Advaccine may elect to conduct a Phase 3 clinical trial outside of Greater China at its own cost and expense for the purposes of obtaining regulatory approval in China, subject to our right to review and approve the protocols and design of such a trial.

AstraZeneca

In August 2015, we entered into a strategic cancer vaccine collaboration and license agreement with AstraZeneca. Under the agreement, AstraZeneca acquired exclusive rights to our immunotherapy candidate INO-3112 (renamed MEDI0457), which targets cancers caused by human papillomavirus (HPV) types 16 and 18.

Under the terms of the agreement, AstraZeneca made an upfront payment of $27.5 million to us in the third quarter of 2015. AstraZeneca will fund all development costs. The agreement also calls for potential future payments totaling up to $700 million upon reaching specified development and commercial milestones. We are entitled to receive up to double-digit tiered royalties on MEDI0457 product sales.

AstraZeneca is studying MEDI0457 in combination with its PD-L1 checkpoint inhibitor, durvalumab, in a Phase 1/2 clinical trial in patients with recurrent or metastatic head and neck squamous cancer associated with HPV. On December 28, 2017, we received a $7.0 million milestone payment from AstraZeneca, which was triggered by the initiation of the Phase 2 portion of this ongoing clinical trial. In December 2018, we received a $2.0 million milestone payment upon the dosing of the first cervical cancer patient in the trial. In January 2019, we received a $2.0 million milestone payment upon the initiation of a Phase 2 combination trial to evaluate MEDI0457 in combination with durvalumab targeting a broad array of cancers associated with HPV.

ApolloBio

In December 2017, we entered into an Amended and Restated License and Collaboration Agreement with Beijing Apollo Saturn Biological Technology Limited, a corporation organized under the laws of China, or ApolloBio. Under the terms of this License and Collaboration Agreement, which became effective in March 2018, we granted to ApolloBio the exclusive right to develop and commercialize VGX-3100, our DNA immunotherapy product candidate designed to treat pre-cancers caused by HPV, within the territories of China, Hong Kong, Macao and Taiwan. The territory may be expanded to include Korea in the event that no patent covering VGX-3100 issues in China within the first three years of the term of the agreement.

As part of the License and Collaboration Agreement, we have granted to ApolloBio an option to negotiate an exclusive license to research, develop and commercialize MEDI0457 in the event of termination of our current collaboration with AstraZeneca for the development of MEDI0457 in the territory covered by the License and Collaboration Agreement. As part of the collaboration, ApolloBio will fund all clinical development costs within the licensed territory, and the parties will discuss in good faith the inclusion of clinical trial sites in China as part of our ongoing Phase 3 clinical development program for VGX-3100.

Under the License and Collaboration Agreement, we received proceeds of $19.4 million in March 2018, which comprised an upfront payment of $23.0 million less $2.2 million in foreign income taxes and $1.4 million in certain foreign non-income taxes. The foreign income taxes were recorded as a provision for income taxes and the foreign non-income taxes were recorded as a general and administrative expense, on the consolidated statement of operations during the year ended December 31, 2018.

In addition to the upfront payment, we are entitled to receive up to an aggregate of $20.0 million, less required income, withholding or other taxes, upon the achievement of specified milestones related to the regulatory approval of VGX-3100 in the United States, China and Korea. In the event that VGX-3100 is approved for marketing in these territories, we will be entitled to receive royalty payments based on a tiered percentage of annual net sales, with such percentage being in the low- to mid-teens, subject to reduction in the event of generic competition in a particular territory. ApolloBio's obligation to pay royalties will continue for 10 years after the first commercial sale in a particular territory or, if later, until the expiration of the last-to-expire patent covering the licensed products in the specified territory. The License and Collaboration Agreement, once effective, will continue in force until ApolloBio has no remaining royalty obligations.

Competition

As we develop and seek to ultimately commercialize our product candidates, we face and will continue to encounter competition with an array of existing or development-stage drug and immunotherapy approaches targeting diseases we are pursuing. We are aware of various established enterprises, including major pharmaceutical companies, broadly engaged in vaccine/immunotherapy research and development. These include Janssen Pharmaceuticals (part of J&J), Sanofi-Aventis, GlaxoSmithKline plc, Merck, Pfizer, and our collaborator AstraZeneca. There are also various development-stage biotechnology companies involved in different vaccine and immunotherapy technologies including but not limited to Advaxis,

Bavarian Nordic, BioNTech, CureVac, Dynavax, Hookipa, Iovance, Moderna, Nektar, Novavax, Translate Bio and Vir Biotechnology. If these companies are successful in developing their technologies, it could materially and adversely affect our business and our future growth prospects.

Merck and GlaxoSmithKline have commercialized preventive vaccines against HPV to protect against cervical cancer. Some companies are seeking to treat early HPV infections or low grade cervical dysplasia. Loop Electrosurgical Excision Procedure, commonly known as LEEP, is the current standard of care for treating high-grade cervical dysplasia. Advaxis and Gilead Sciences have therapeutic cervical cancer product candidates under development. Many companies are pursuing different approaches to GBM, prostate, breast, lung and other cancers we are targeting.

A large number of companies are actively advancing COVID-19 vaccines through the clinic. Pfizer and BioNtech, Moderna Therapeutics, Janssen (J&J) and AstraZeneca have received approval for their COVID-19 vaccines from either the U.S. or European regulatory authorities. Additionally, several companies such as CanSino Biologics, SinoVAc, Bharat Biotech and Novavax are currently developing vaccine candidates into Phase 2 and Phase 3 clinical stage of development.

We also compete more specifically with companies seeking to utilize antigen-encoding DNA delivered with electroporation or other DNA delivery technologies such as viral vectors or lipid vectors to induce *in vivo* generated antigen production and immune responses to prevent or treat various diseases. These competitive technologies have shown promise, but they each also have their unique obstacles to overcome.

Viral Vaccine Delivery

This technology utilizes a virus as a carrier to deliver genetic material into target cells. The method is efficient for delivering immunotherapy antigens and has the advantage of mimicking real viral infection so that the recipient will mount a broad immune response against the immunotherapy. The greatest limitation of the technology stems from problems with unwanted immune responses against the viral vector, limiting its use to patients who have not been previously exposed to the viral vector and making repeated administration difficult. In addition, complexity and safety concerns increase their cost and complicate regulatory approval.

Lipid DNA/RNA Delivery

A number of lipid formulations have been developed that increase the effect of DNA/RNA immunotherapies. These work by either increasing uptake of the DNA/RNA into cells or by acting as an adjuvant, alerting the immune system. While there has been significant progress in this field, including emergency approval of COVID-19 mRNA vaccines in 2020, lipid nanoparticle delivery of mRNA has thermal stability issues as well as the potential of adverse events from the lipid nanoparticle formulations.

DNA Immunotherapy Delivery with Electroporation

There are other companies with electroporation intellectual property and devices. We believe we have significant competitive advantages over other companies focused on electroporation for multiple reasons:

- We have an extensive history and experience in developing the methods and devices that optimize the use of electroporation in conjunction with DNA-based agents. This experience has been validated with multiple sets of interim data from multiple clinical studies assessing DNA-based immunotherapies and vaccines against cancers and infectious disease.
- We have a broad product line of electroporation instruments designed to enable DNA delivery in tumors, muscle, and skin.
- We have been proactive in filing for patents, as well as acquiring and licensing additional patents, to expand our global patent estate.

If any of our competitors develop products with efficacy or safety profiles significantly better than our product candidates, we may not be able to commercialize our products, and sales of any of our commercialized products could be harmed. Some of our competitors and potential competitors have substantially greater product development capabilities and financial, scientific, marketing and human resources than we do. Competitors may develop products earlier, obtain FDA approvals for products more rapidly, or develop products that are more effective than those under development by us. We will seek to expand our technological capabilities to remain competitive; however, research and development by others may render our technologies or products obsolete or noncompetitive, or result in treatments or cures superior to ours.

Our competitive position will be affected by the disease indications addressed by our product candidates and those of our competitors, the timing of market introduction for these products and the stage of development of other technologies to address these disease indications. For us and our competitors, proprietary technologies, the ability to complete clinical trials on a timely basis and with the desired results, and the ability to obtain timely regulatory approvals to market these product candidates are likely to be significant competitive factors. Other important competitive factors will include the efficacy, safety, ease of use,

reliability, availability and price of products and the ability to fund operations during the period between technological conception and commercial sales.

The FDA and other regulatory agencies may expand current requirements for public disclosure of DNA-based product development data, which may harm our competitive position with foreign and United States companies developing DNA-based products for similar indications.

Commercialization and Manufacturing

Because of the broad potential applications of our technologies, we intend to develop and commercialize products both on our own and through our collaborators and licensees. We intend to develop and commercialize products in well-defined specialty markets, such as infectious diseases and cancer. Where appropriate, we intend to rely on strategic marketing and distribution alliances.

We believe our plasmids can be produced in commercial quantities through uniform methods of fermentation and processing that are applicable to all plasmids. We believe we will be able to obtain sufficient supplies of plasmids for all foreseeable clinical investigations.

Intellectual Property

Patents and other proprietary rights are essential to our business. We file patent applications to protect our technologies, inventions and improvements to our inventions that we consider important to the development of our business. We file for patent registration extensively in the United States and in key foreign markets. Although our patent filings include claims covering various features of our products and product candidates, including composition, methods of manufacture and use, our patents do not provide us with complete protection, or guarantee, against the development of competing products. In addition, some of our know-how and technology are not patentable. We thus also rely upon trade secrets, know-how, continuing technological innovations and licensing opportunities to develop and maintain our competitive position. We also require employees, consultants, advisors and collaborators to enter into confidentiality agreements, but such agreements may provide limited protection for our trade secrets, know-how or other proprietary information.

Our intellectual property portfolio covers our proprietary technologies, including CELLECTRA® delivery systems as well as immunotherapy and vaccine construct related technologies. As of December 31, 2020, our patent portfolio included 84 issued United States patents and over 500 issued foreign counterpart patents. We also have a number of patent applications pending in the United States and various foreign jurisdictions.

If we fail to protect our intellectual property rights adequately our competitors might gain access to our technology and our business would thus be harmed. In addition, defending our intellectual property rights might entail significant expense. Any of our intellectual property rights may be challenged by others or invalidated through administrative processes or litigation through the courts. In addition, our patents, or any other patents that may be issued to us in the future, may not provide us with any competitive advantages, or may be challenged by third parties. Furthermore, legal standards relating to the validity, enforceability and scope of protection of intellectual property rights are uncertain. Effective patent, trademark, copyright and trade secret protection may not be available to us in each country where we operate. The laws of some foreign countries may not be as protective of intellectual property rights as those in the United States, and domestic and international mechanisms for enforcement of intellectual property rights in those countries may be inadequate. Accordingly, despite our efforts, we may be unable to prevent third parties from infringing upon or misappropriating our intellectual property or otherwise gaining access to our technology. We may be required to expend significant resources to monitor and protect our intellectual property rights. We may initiate claims or litigation against third parties for infringement of our proprietary rights or to establish the validity of our proprietary rights. Any such litigation, whether or not it is ultimately resolved in our favor, would result in significant expense to us and divert the efforts of our technical and management personnel.

There may be rights we are not aware of, including applications that have been filed but not published that, when issued, could be asserted against us. These third-parties could bring claims against us, and that would cause us to incur substantial expenses and, if successful against us, could cause us to pay substantial damages. Further, if a patent infringement suit were brought against us, we could be forced to stop or delay research, development, manufacturing or sales of the product or biologic drug candidate that is the subject of the suit. As a result of patent infringement claims, or in order to avoid potential claims, we may choose or be required to seek a license from the third-party. These licenses may not be available on acceptable terms, or at all. Even if we are able to obtain a license, the license would likely obligate us to pay license fees or royalties or both, and the rights granted to us might be non-exclusive, which could result in our competitors gaining access to the same intellectual property. Ultimately, we could be prevented from commercializing a product, or be forced to cease some aspect of our business operations, if, as a result of actual or threatened patent infringement claims, we are unable to enter into licenses on acceptable terms. All of the issues described above could also impact our collaborators, which would also impact the success of the collaboration and therefore us.

Important legal issues remain to be resolved as to the extent and scope of available patent protection for biologic products, including vaccines, and processes in the United States and other important markets outside the United States, such as Europe and Japan. Foreign markets may not provide the same level of patent protection as provided under the United States patent system. We recognize that litigation or administrative proceedings may be necessary to determine the validity and scope of certain of our and others' proprietary rights. Any such litigation or proceeding may result in a significant commitment of resources in the future and could force us to interrupt our operations, redesign our products or processes, or negotiate a license agreement, all of which would adversely affect our revenue. Furthermore, changes in, or different interpretations of, patent laws in the United States and other countries may result in patent laws that allow others to use our discoveries or develop and commercialize our products.

We cannot guarantee that the patents we obtain or the unpatented technology we hold will afford us significant commercial protection.

Government Regulation

Government authorities in the United States at the federal, state and local level and in other countries extensively regulate, among other things, the research, development, testing, manufacture, quality control, approval, labeling, packaging, storage, record-keeping, promotion, advertising, distribution, post-approval monitoring and reporting, marketing and export and import of biological products, or biologics, and medical devices, such as our product candidates. Generally, before a new biologic or medical device can be marketed, considerable data demonstrating its quality, safety and efficacy must be obtained, organized into a format specific to each regulatory authority, submitted for review and approved by the regulatory authority.

Review and Approval of Combination Products in the United States

Certain products may be comprised of components that would normally be regulated under different types of regulatory authorities, and frequently by different centers at the FDA. These products are known as combination products. Specifically, under regulations issued by the FDA, a combination product may be:

- A product comprised of two or more regulated components that are physically, chemically, or otherwise combined or mixed and produced as a single entity;
- Two or more separate products packaged together in a single package or as a unit and comprised of drug and device products;
- A drug, device, or biological product packaged separately that according to its investigational plan or proposed labeling is intended for use only with an approved individually specified drug, device or biological where both are required to achieve the intended use, indication, or effect and where upon approval of the proposed product the labeling of the approved product would need to be changed, e.g., to reflect a change in intended use, dosage form, strength, route of administration, or significant change in dose; or
- Any investigational drug, device, or biological packaged separately that according to its proposed labeling is for use only with another individually specified investigational drug, device, or biological product where both are required to achieve the intended use, indication, or effect.

Our product candidates are combination products comprising an electroporation device for delivery of a biologic. Under the Federal Food, Drug, and Cosmetic Act, or FDCA, the FDA is charged with assigning a center with primary jurisdiction, or a lead center, for review of a combination product. That determination is based on the "primary mode of action" of the combination product, which means the mode of action expected to make the greatest contribution to the overall intended therapeutic effects. Thus, if the primary mode of action of a device-biologic combination product is attributable to the biologic product, that is, if it acts by means of a virus, therapeutic serum, toxin, antitoxin, vaccine, blood, blood component or derivative, allergenic product, or analogous product, the FDA center responsible for premarket review of the biologic product would have primary jurisdiction for the combination product. We believe that all of our product candidates will have a biologic primary mode of action, with the device component reviewed under a Device Master File.

U.S. Biological Product Development

In the United States, the FDA regulates biologics under FDCA, and the Public Health Service Act, or PHSA, and their implementing regulations. Biologics are also subject to other federal, state, and local statutes and regulations. The process of obtaining regulatory approvals and the subsequent compliance with appropriate federal, state, local and foreign statutes and regulations require the expenditure of substantial time and financial resources. Failure to comply with the applicable U.S. requirements at any time during the product development process, approval process or after approval, may subject an applicant to administrative or judicial sanctions. These sanctions could include, among other actions, the FDA's refusal to approve pending applications, withdrawal of an approval, a clinical hold, untitled or warning letters, product recalls or withdrawals from the market, product seizures, total or partial suspension of production or distribution injunctions, fines, refusals of government contracts, restitution, disgorgement, or civil or criminal penalties. Any agency or judicial enforcement action could have a material adverse effect on us.

Our product candidates must be approved by the FDA through the Biologics License Application, or BLA, process before they may be legally marketed in the United States. The process required by the FDA before a biologic may be marketed in the United States generally involves the following:

- Completion of extensive nonclinical, sometimes referred to as pre-clinical laboratory tests, pre-clinical animal studies and formulation studies in accordance with applicable regulations, including the FDA's Good Laboratory Practice, or GLP, regulations;
- Submission to the FDA of an IND, which must become effective before human clinical trials may begin;
- Performance of adequate and well-controlled human clinical trials in accordance with applicable IND and other clinical trial-related regulations, sometimes referred to as good clinical practices, or GCPs, to establish the safety and efficacy of the proposed product candidate for its proposed indication;
- Submission to the FDA of a BLA;
- Satisfactory completion of an FDA pre-approval inspection of the manufacturing facility or facilities where the product is produced to assess compliance with the FDA's current good manufacturing practice, or cGMP, requirements to assure that the facilities, methods and controls are adequate to preserve the product's identity, strength, quality, purity and potency;
- Potential FDA audit of the pre-clinical and/or clinical trial sites that generated the data in support of the BLA; and
- FDA review and approval of the BLA prior to any commercial marketing or sale of the product in the United States.

The data required to support a BLA is generated in two distinct development stages: pre-clinical and clinical. The pre-clinical development stage generally involves laboratory evaluations of drug chemistry, formulation and stability, as well as studies to evaluate toxicity in animals, which support subsequent clinical testing. The conduct of the pre-clinical studies must comply with federal regulations, including GLPs. The sponsor must submit the results of the pre-clinical studies, together with manufacturing information, analytical data, any available clinical data or literature and a proposed clinical protocol, to the FDA as part of the IND. An IND is a request for authorization from the FDA to administer an investigational drug product to humans. The central focus of an IND submission is on the general investigational plan and the protocol(s) for human trials. The IND automatically becomes effective 30 days after receipt by the FDA, unless the FDA raises concerns or questions regarding the proposed clinical trials and places the IND on clinical hold within that 30-day time period. In such a case, the IND sponsor and the FDA must resolve any outstanding concerns before the clinical trial can begin. The FDA may also impose clinical holds on a product candidate at any time before or during clinical trials due to safety concerns or non-compliance. Accordingly, we cannot be sure that submission of an IND will result in the FDA allowing clinical trials to begin, or that, once begun, issues will not arise that could cause the trial to be suspended or terminated.

The clinical stage of development involves the administration of the product candidate to healthy volunteers or patients under the supervision of qualified investigators, generally physicians not employed by or under the trial sponsor's control, in accordance with GCPs, which include the requirement that all research subjects provide their informed consent for their participation in any clinical trial. Clinical trials are conducted under protocols detailing, among other things, the objectives of the clinical trial, dosing procedures, subject selection and exclusion criteria, and the parameters to be used to monitor subject safety and assess efficacy. Each protocol, and any subsequent amendments to the protocol, must be submitted to the FDA as part of the IND. Further, each clinical trial must be reviewed and approved by an independent institutional review board, or IRB, at or servicing each institution at which the clinical trial will be conducted. An IRB is charged with protecting the welfare and rights of trial participants and considers such items as whether the risks to individuals participating in the clinical trials are minimized and are reasonable in relation to anticipated benefits. The IRB also approves the informed consent form that must be provided to each clinical trial subject or his or her legal representative and must monitor the clinical trial until completed.

There are also requirements governing the reporting of ongoing clinical trials and completed clinical trial results to public registries. Sponsors of certain clinical trials of FDA-regulated products, including biologics, are required to register and disclose specified clinical trial information, which is publicly available at www.clinicaltrials.gov. Information related to the product, patient population, phase of investigation, study sites and investigators, and other aspects of the clinical trial is then made public as part of the registration. Sponsors are also obligated to disclose the results of their clinical trials after completion.

Clinical trials are generally conducted in three sequential phases that may overlap, known as Phase 1, Phase 2 and Phase 3 clinical trials. Phase 1 clinical trials generally involve a small number of healthy volunteers who are initially exposed to a product candidate. The primary purpose of these clinical trials is to assess the action, side effect tolerability and safety of the product candidate and, if possible, to gain early evidence on effectiveness. Phase 2 clinical trials typically involve studies in patients to determine the dose required to produce the desired benefits. At the same time, safety and preliminary evaluation of efficacy is assessed. Phase 3 clinical trials generally involve large numbers of patients at multiple sites, in multiple countries (from several hundred to several thousand subjects) and are designed to provide the data necessary to demonstrate the efficacy of the product for its intended use, its safety in use, and to establish the overall benefit/risk relationship of the product and

provide an adequate basis for product approval. Phase 3 clinical trials may include comparisons with placebo and/or other comparator treatments. The duration of treatment is often extended to mimic the actual use of a product during marketing. Generally, two adequate and well-controlled Phase 3 clinical trials are required by the FDA for approval of a BLA.

Post-approval trials, sometimes referred to as Phase 4 clinical trials, may be conducted after initial marketing approval. These trials are used to gain additional experience from the treatment of patients in the intended therapeutic indication. In certain instances, FDA may grant conditional approval of a BLA on the sponsor's agreement to conduct additional clinical trials, such as these post-approval trials, to further assess the biologic's safety and effectiveness after BLA approval.

Progress reports detailing the results of the clinical trials must be submitted at least annually to the FDA and written IND safety reports must be submitted to the FDA and the investigators for serious and unexpected suspected adverse, findings from other studies suggesting a significant risk to humans exposed to the drug, findings from animal or *in vitro* testing suggesting a significant risk to humans, and any clinically important rate increase of a serious suspected adverse reaction over that listed in the protocol or investigator brochure. Phase 1, Phase 2 and Phase 3 clinical trials may not be completed successfully within any specified period, if at all. The FDA, the IRB, or the sponsor may suspend or terminate a clinical trial at any time on various grounds, including a finding that the research subjects or patients are being exposed to an unacceptable health risk. Similarly, an IRB can suspend or terminate approval of a clinical trial at its institution if the clinical trial is not being conducted in accordance with the IRB's requirements or if the drug has been associated with unexpected serious harm to patients. Additionally, some clinical trials are overseen by an independent group of qualified experts organized by the clinical trial sponsor, known as a data safety monitoring board or committee. This group provides authorization for whether or not a trial may move forward at designated intervals based on access to certain data from the trial. We may also suspend or terminate a clinical trial based on evolving business objectives and/or competitive climate. Concurrent with clinical trials, companies usually complete additional animal studies and must also develop additional information about the chemistry and physical characteristics of the product candidate as well as finalize a process for manufacturing the product in commercial quantities in accordance with cGMP requirements. The manufacturing process must be capable of consistently producing quality batches of the product candidate and, among other things, must develop methods for testing the identity, strength, quality and purity of the final product. Additionally, appropriate packaging must be selected and tested and stability studies must be conducted to demonstrate that the product candidate does not undergo unacceptable deterioration over its shelf life.

BLA and FDA Review Process

Following trial completion, trial data is analyzed to assess safety and efficacy. The results of pre-clinical studies and clinical trials are then submitted to the FDA as part of a BLA, along with proposed labeling for the product and information about the manufacturing process and facilities that will be used to ensure product quality, results of analytical testing conducted on the chemistry of the product candidate, and other relevant information. The BLA is a request for approval to market the biologic for one or more specified indications and must contain proof of safety, purity, potency and efficacy, which is demonstrated by extensive pre-clinical and clinical testing. The application includes positive findings from pre-clinical and clinical trials as well as ambiguous or negative results. Data may come from company-sponsored clinical trials intended to test the safety and efficacy of a use of a product, or from a number of alternative sources, including studies initiated by investigators. To support marketing approval, the data submitted must be sufficient in quality and quantity to establish the safety and efficacy of the investigational product to the satisfaction of the FDA.

Under the Prescription Drug User Fee Act, or PDUFA, as amended, each BLA must be accompanied by a significant user fee, which is adjusted on an annual basis. PDUFA also imposes an annual program fee for approved products. Fee waivers or reductions are available in certain circumstances, including a waiver of the application fee for the first application filed by a small business.

Once a BLA has been accepted for filing, which occurs, if at all, sixty days after the BLA's submission, the FDA's goal is to review BLAs within ten months of the filing date for standard review or six months of the filing date for priority review, if the application is for a product intended for a serious or life-threatening condition and the product, if approved, would provide a significant improvement in safety or effectiveness. The review process is often significantly extended by FDA requests for additional information or clarification. If not accepted for filing, the sponsor must resubmit the BLA and begin the FDA's review process again, including the initial sixty day review to determine if the application is sufficiently complete to permit substantive review.

After the BLA submission is accepted for filing, the FDA reviews the BLA to determine, among other things, whether the proposed product candidate is safe and effective for its intended use, and whether the product candidate is being manufactured in accordance with cGMP to assure and preserve the product candidate's identity, strength, quality, purity and potency. The FDA may refer applications for novel drug product candidates or drug product candidates which present difficult questions of safety or efficacy to an advisory committee, typically a panel that includes clinicians and other experts, for review, evaluation and a recommendation as to whether the application should be approved and under what conditions. The FDA is not bound by the recommendations of an advisory committee, but it considers such recommendations carefully when making decisions. The FDA will likely re-analyze the clinical trial data, which could result in extensive discussions between the FDA and us during

the review process. The review and evaluation of a BLA by the FDA is extensive and time consuming and may take longer than originally planned to complete, and we may not receive a timely approval, if at all.

Before approving a BLA, the FDA will conduct a pre-approval inspection of the manufacturing facilities for the new product to determine whether they comply with cGMPs. The FDA will not approve the product unless it determines that the manufacturing processes and facilities are in compliance with cGMP requirements and adequate to assure consistent production of the product within required specifications. In addition, before approving a BLA, the FDA may also audit data from clinical trials to ensure compliance with GCP requirements. After the FDA evaluates the application, manufacturing process and manufacturing facilities, it may issue an approval letter or a Complete Response Letter. An approval letter authorizes commercial marketing of the product with specific prescribing information for specific indications. A Complete Response Letter indicates that the review cycle of the application is complete and the application will not be approved in its present form. A Complete Response Letter usually describes all of the specific deficiencies in the BLA identified by the FDA. The Complete Response Letter may require additional clinical data and/or an additional pivotal Phase 3 clinical trial(s), and/or other significant and time-consuming requirements related to clinical trials, pre-clinical studies or manufacturing. If a Complete Response Letter is issued, the applicant may either resubmit the BLA, addressing all of the deficiencies identified in the letter, or withdraw the application. Even if such data and information is submitted, the FDA may ultimately decide that the BLA does not satisfy the criteria for approval. Data obtained from clinical trials are not always conclusive and the FDA may interpret data differently than we interpret the same data.

There is no assurance that the FDA will ultimately approve a product for marketing in the United States and we may encounter significant difficulties or costs during the review process. If a product receives marketing approval, the approval may be significantly limited to specific populations, severities of allergies, and dosages or the indications for use may otherwise be limited, which could restrict the commercial value of the product. Further, the FDA may require that certain contraindications, warnings or precautions be included in the product labeling or may condition the approval of the BLA on other changes to the proposed labeling, development of adequate controls and specifications, or a commitment to conduct post-market testing or clinical trials and surveillance to monitor the effects of approved products. For example, the FDA may require Phase 4 testing which involves clinical trials designed to further assess the product's safety and effectiveness and may require testing and surveillance programs to monitor the safety of approved products that have been commercialized. The FDA may also place other conditions on approvals including the requirement for a Risk Evaluation and Mitigation Strategy, or REMS, to assure the safe use of the product. If the FDA concludes a REMS is needed, the sponsor of the BLA must submit a proposed REMS. The FDA will not approve the BLA without an approved REMS, if required. A REMS could include medication guides, physician communication plans, or elements to assure safe use, such as restricted distribution methods, patient registries and other risk minimization tools. Any of these limitations on approval or marketing could restrict the commercial promotion, distribution, prescription or dispensing of products. Product approvals may be withdrawn for non-compliance with regulatory standards or if problems occur following initial marketing.

Post-Marketing Requirements

Following approval of a new product, a manufacturer and the approved product are subject to continuing regulation by the FDA, including, among other things, monitoring and recordkeeping activities, reporting to the applicable regulatory authorities of adverse experiences with the product, providing the regulatory authorities with updated safety and efficacy information, product sampling and distribution requirements, and complying with promotion and advertising requirements, which include, among others, standards for direct-to-consumer advertising, restrictions on promoting products for uses or in patient populations that are not described in the product's approved labeling, also known as off-label use, limitations on industry-sponsored scientific and educational activities, and requirements for promotional activities involving the internet. Although physicians may prescribe legally available drugs and biologics for off-label uses, manufacturers may not market or promote such off-label uses. Modifications or enhancements to the product or its labeling or changes of the site of manufacture are often subject to the approval of the FDA and other regulators, which may or may not be received or may result in a lengthy review process. Prescription drug promotional materials must be submitted to the FDA in conjunction with their first use. Any distribution of prescription drug products and pharmaceutical samples must comply with the U.S. Prescription Drug Marketing Act, or the PDMA, a part of the FDCA.

In the United States, once a product is approved, its manufacture is subject to comprehensive and continuing regulation by the FDA. The FDA regulations require that products be manufactured in specific approved facilities and in accordance with cGMP. Moreover, the constituent parts of a combination product retain their regulatory status, for example, as a biologic or device, and as such, we may be subject to additional requirements in the Quality System Regulation, or QSR, applicable to medical devices, such as design controls, purchasing controls, and corrective and preventive action. We rely, and expect to continue to rely, on third parties for the production of clinical and commercial quantities of our products in accordance with cGMP regulations. cGMP regulations require, among other things, quality control and quality assurance as well as the corresponding maintenance of records and documentation and the obligation to investigate and correct any deviations from cGMP. Manufacturers and other entities involved in the manufacture and distribution of approved products are required to register their establishments with the FDA and certain state agencies, and are subject to periodic unannounced inspections by

the FDA and certain state agencies for compliance with cGMP and other laws. Accordingly, manufacturers must continue to expend time, money, and effort in the area of production and quality control to maintain cGMP compliance. These regulations also impose certain organizational, procedural and documentation requirements with respect to manufacturing and quality assurance activities. BLA holders using contract manufacturers, laboratories or packagers are responsible for the selection and monitoring of qualified firms, and, in certain circumstances, qualified suppliers to these firms. These firms and, where applicable, their suppliers are subject to inspections by the FDA at any time, and the discovery of violative conditions, including failure to conform to cGMP, could result in enforcement actions that interrupt the operation of any such facilities or the ability to distribute products manufactured, processed or tested by them. Discovery of problems with a product after approval may result in restrictions on a product, manufacturer, or holder of an approved BLA, including, among other things, recall or withdrawal of the product from the market.

The FDA also may require post-approval testing, sometimes referred to as Phase 4 testing, REMS and post-marketing surveillance to monitor the effects of an approved product or place conditions on an approval that could restrict the distribution or use of the product. Discovery of previously unknown problems with a product or the failure to comply with applicable FDA requirements can have negative consequences, including adverse publicity, judicial or administrative enforcement, warning letters from the FDA, mandated corrective advertising or communications with doctors, and civil or criminal penalties, among others. Newly discovered or developed safety or effectiveness data may require changes to a product's approved labeling, including the addition of new warnings and contraindications, and also may require the implementation of other risk management measures. Also, new government requirements, including those resulting from new legislation, may be established, or the FDA's policies may change, which could delay or prevent regulatory approval of our products under development.

Coverage and Reimbursement

Patients in the United States and elsewhere generally rely on third-party payors to reimburse part or all of the costs associated with their prescription drugs. Accordingly, a pharmaceutical company's ability to commercialize its products successfully depends in part on the extent to which private health insurers, other third-party payors, and governmental authorities, including Medicare and Medicaid, establish appropriate coverage and reimbursement levels for its product candidates and related treatments. As a threshold for coverage and reimbursement, third-party payors generally require that products be approved for marketing by the FDA.

Coverage decisions may not favor new products when more established or lower cost therapeutic alternatives are available. The process for obtaining coverage for a product or service is separate from the process to obtain the associated reimbursement. Reimbursement levels can affect the adoption of products and services by physicians and patients. Additionally, products used in connection with medical procedures may not be reimbursed separately, but their cost may instead be bundled as part of the payment received by the provider for the procedure only. Separate reimbursement for a product or the treatment or procedure in which the product is used may not be available.

Coverage and reimbursement policies for drug products can differ significantly from payor to payor as there is no uniform policy of coverage and reimbursement for drug products among third-party payors in the United States. There may be significant delays in obtaining coverage and reimbursement as the process of determining coverage and reimbursement is often time consuming and costly which may require the provision of scientific and clinical support for the use of the product to each payor separately, with no assurance that coverage or adequate reimbursement will be obtained.

A significant trend in the U.S. healthcare industry and elsewhere is cost containment. Third-party payors have attempted to control costs by limiting coverage and the amount of reimbursement for particular products and services. Third-party payors are increasingly challenging the effectiveness of and prices charged for medical products and services. Moreover, the U.S. government, state legislatures and foreign governmental entities have shown significant interest in implementing cost containment programs to limit the growth of government paid healthcare costs, including price controls, restrictions on reimbursement and coverage and requirements for substitution of generic products for branded prescription drugs.

Healthcare Reform

In both the United States and certain foreign jurisdictions there have been, and continue to be, a number of legislative and regulatory changes to the healthcare system that impact the ability to sell pharmaceutical products profitably. In the United States, the federal government enacted the Patient Protection and Affordable Care Act, as amended by the Health Care and Education Reconciliation Act, or collectively, the ACA. Among the ACA's provisions of importance to the pharmaceutical industry are that it:

- Created an annual, nondeductible fee on any entity that manufactures or imports certain specified branded prescription drugs and biologic agents apportioned among these entities according to their market share in some government healthcare programs;

- Increased the statutory minimum rebates a manufacturer must pay under the Medicaid Drug Rebate Program, to 23.1% and 13% of the average manufacturer price for most branded and generic drugs, respectively and capped the total rebate amount for innovator drugs at 100% of the Average Manufacturer Price, or AMP;
- Created new methodology by which rebates owed by manufacturers under the Medicaid Drug Rebate Program are calculated for certain drugs and biologics that are inhaled, infused, instilled, implanted or injected;
- Expanded eligibility criteria for Medicaid programs by, among other things, allowing states to offer Medicaid coverage to additional individuals and by adding new mandatory eligibility categories for individuals with income at or below 133% of the federal poverty level, thereby potentially increasing manufacturers' Medicaid rebate liability;
- Expanded the entities eligible for discounts under the Public Health program;
- Created a new Patient-Centered Outcomes Research Institute to oversee, identify priorities in, and conduct comparative clinical effectiveness research, along with funding for such research;
- Established a Center for Medicare & Medicaid Innovation at the Centers for Medicare & Medicaid Services, or CMS, to test innovative payment and service delivery models to lower Medicare and Medicaid spending, potentially including prescription drug spending that began on January 1, 2011; and
- Created a licensure framework for follow on biologic products.

There remain judicial and Congressional challenges to certain aspects of the ACA. While Congress has not passed comprehensive repeal legislation, it has enacted laws that modify certain provisions of the ACA such as removing penalties, starting January 1, 2019, for not complying with the ACA's individual mandate to carry qualifying health insurance coverage for all or part of a year. In addition, the 2020 federal spending package permanently eliminated, effective January 1, 2020, the ACA-mandated "Cadillac" tax on high-cost employer-sponsored health coverage and medical device tax, and, effective January 1, 2021, also eliminated the health insurer tax. On December 14, 2018, a Texas U.S. District Court Judge ruled that the ACA is unconstitutional in its entirety because the "individual mandate" was repealed by Congress as part of the Tax Cuts and Jobs Act of 2017. Additionally, on December 18, 2019, the U.S. Court of Appeals for the 5th Circuit upheld the District Court ruling that the individual mandate was unconstitutional and remanded the case back to the District Court to determine whether the remaining provisions of the ACA are invalid as well. The U.S. Supreme Court is currently reviewing the case, although it is unknown when a decision will be made. Further, although the U.S. Supreme Court has not yet ruled on the constitutionality of the ACA, on January 28, 2021, President Biden issued an executive order to initiate a special enrollment period from February 15, 2021 through May 15, 2021 for purposes of obtaining health insurance coverage through the ACA marketplace. The executive order also instructs certain governmental agencies to review and reconsider their existing policies and rules that limit access to healthcare, including among others, reexamining Medicaid demonstration projects and waiver programs that include work requirements, and policies that create unnecessary barriers to obtaining access to health insurance coverage through Medicaid or the ACA. It is unclear how the Supreme Court ruling, other such litigation, and the healthcare reform measures of the Biden administration will impact the ACA and our business. In addition, other legislative changes have been proposed and adopted since the ACA was enacted. On August 2, 2011, the Budget Control Act of 2011 was signed into law, which, among other things, included reductions to Medicare payments to providers of 2% per fiscal year, which went into effect on April 1, 2013 and, due to subsequent legislative amendments to the statute will remain in effect through 2030 with the exception of a temporary suspension from May 1, 2020 through March 31, 2021 unless additional Congressional action is taken. On January 2, 2013, the American Taxpayer Relief Act of 2012 was signed into law, which, among other things, reduced Medicare payments to several providers, including hospitals, and increased the statute of limitations period for the government to recover overpayments to providers from three to five years.

Further there has been heightened governmental scrutiny in the United States of pharmaceutical pricing practices in light of the rising cost of prescription drugs and biologics. Such scrutiny has resulted in several recent congressional inquiries and proposed and enacted federal and state legislation designed to, among other things, bring more transparency to product pricing, review the relationship between pricing and manufacturer patient programs, and reform government program reimbursement methodologies for products. At the federal level, the Trump administration used several means to propose or implement drug pricing reform, including through federal budget proposals, executive orders and policy initiatives. For example, on July 24, 2020 and September 13, 2020, the Trump administration announced several executive orders related to prescription drug pricing that seek to implement several of the administration's proposals. As a result, the FDA released a final rule on September 24, 2020, effective November 30, 2020, providing guidance for states to build and submit importation plans for drugs from Canada. Further, on November 20, 2020, HHS finalized a regulation removing safe harbor protection for price reductions from pharmaceutical manufacturers to plan sponsors under Part D, either directly or through pharmacy benefit managers, unless the price reduction is required by law. The implementation of the rule has been delayed by the Biden administration from January 1, 2022 to January 1, 2023 in response to ongoing litigation. The rule also creates a new safe harbor for price reductions reflected at the point-of-sale, as well as a new safe harbor for certain fixed fee arrangements between pharmacy benefit managers and manufacturers, the implementation of which have also been delayed pending review by the Biden administration

until March 22, 2021. On November 20, 2020, CMS issued an interim final rule implementing the Trump administration's Most Favored Nation executive order, which would tie Medicare Part B payments for certain physician-administered drugs to the lowest price paid in other economically advanced countries, effective January 1, 2021. On December 28, 2020, the United States District Court in Northern California issued a nationwide preliminary injunction against implementation of the interim final rule. It is unclear whether the Biden administration will work to reverse these measures or pursue similar policy initiatives. Further, at the state level, legislatures have increasingly passed legislation and implemented regulations designed to control pharmaceutical and biological product pricing, including price or patient reimbursement constraints, discounts, restrictions on certain product access and marketing cost disclosure and transparency measures, and, in some cases, designed to encourage importation from other countries and bulk purchasing. It is also possible that additional governmental action is taken in response to the COVID-19 pandemic.

Healthcare Laws

Certain federal, state, local and foreign healthcare laws and regulations pertaining to fraud and abuse, transparency, patients' rights, and privacy are applicable to the business of a pharmaceutical company. The laws that may affect a pharmaceutical company's ability to operate include:

- The federal healthcare program Anti-Kickback Statute, which prohibits, among other things, people from soliciting, receiving or providing remuneration, directly or indirectly, to induce or reward either the referral of an individual, or the purchasing, ordering, or leasing of an item, good, facility or service, for which payment may be made by a federal healthcare program such as Medicare or Medicaid;
- Federal civil and criminal false claims laws, including the civil False Claims Act, which prohibit, among other things, individuals or entities from knowingly presenting, or causing to be presented, claims for payment from Medicare, Medicaid, or other third-party payors that are false or fraudulent;
- The federal Health Insurance Portability and Accountability Act of 1996, or HIPAA, which prohibits, among other things, executing a scheme to defraud any healthcare benefit program or making false statements relating to healthcare matters;
- HIPAA, as amended by the Health Information Technology for Economic and Clinical Health Act, and their implementing regulations, which imposes certain requirements relating to the privacy, security and transmission of individually identifiable health information on certain individuals and entities;
- the Physician Payments Sunshine Act, created under the ACA, which requires certain manufacturers of drugs, devices, biologics and medical supplies for which payment is available under Medicare, Medicaid or the Children's Health Insurance Program, with certain exceptions, to report annually to the Centers for Medicare & Medicaid Services, or CMS, information related to payments or other transfers of value made to physicians (defined to include doctors, dentists, optometrists, podiatrists, and chiropractors) and teaching hospitals, as well as ownership and investment interests held by physicians and their immediate family members, and which, beginning in 2022, will require applicable manufacturers to report information regarding payments and other transfers of value provided during the previous year to physician assistants, nurse practitioners, clinical nurse specialists, certified nurse anesthetists, anesthesiologist assistants, and certified nurse-midwives;
- The Federal Food, Drug, and Cosmetic Act, which among other things, strictly regulates drug product marketing, prohibits manufacturers from marketing drug products for off-label use and regulates the distribution of drug samples;
- The U.S. Foreign Corrupt Practices Act, which, among other things, prohibits companies issuing stock in the U.S. from bribing foreign officials for government contracts and other business; and
- State law equivalents of each of the above federal laws, such as anti-kickback and false claims laws which may apply to items or services reimbursed by any third-party payor, including commercial insurers, state and local laws requiring the registration of pharmaceutical sales and medical representatives, and state laws governing the privacy and security of health information in certain circumstances, many of which differ from each other in significant ways and often are not preempted by HIPAA, thus complicating compliance efforts; and
- Additional state and local laws such as laws in California and Massachusetts, which mandate implementation of compliance programs, compliance with industry ethics codes, and spending limits, and other state and local laws, such as laws in Vermont, Maine, and Minnesota which require reporting to state governments of gifts, compensation, and other remuneration to physicians.

A pharmaceutical company will need to spend substantial time and money to ensure that its business arrangements with third parties comply with applicable healthcare laws and regulations. Because of the breadth of these laws and the narrowness

of the statutory exceptions and regulatory safe harbors available, which require strict compliance in order to offer protection, it is possible that governmental authorities may conclude that its business practices do not comply with current or future statutes, regulations, agency guidance or case law involving applicable healthcare laws. If a pharmaceutical company's operations are found to be in violation of any of the laws described above or any other governmental regulations that apply to it, it may be subject to significant penalties, including administrative, civil and criminal penalties, damages, fines, disgorgement, possible exclusion from participation in Medicare, Medicaid and other federal healthcare programs, imprisonment, integrity and/or other oversight obligations, contractual damages, reputational harm and the curtailment or restructuring of operations.

Other Regulations

We also are subject to various federal, state and local laws, regulations, and recommendations relating to safe working conditions, laboratory and manufacturing practices, the experimental use of animals, and the use and disposal of hazardous or potentially hazardous substances, including radioactive compounds and infectious disease agents, used in connection with our research. The extent of government regulation that might result from any future legislation or administrative action cannot be accurately predicted.

Significant Customers and Research and Development

During the year ended December 31, 2020, we derived 68% of our revenue from Advaccine and 18% of our revenue from Plumbline Life Sciences. During the year ended December 31, 2019, we derived 78% of our revenue from AstraZeneca. During the year ended December 31, 2018, we derived 75% of our revenue from ApolloBio and 23% of our revenue from AstraZeneca. Since our inception, virtually all of our activities have consisted of research and development efforts related to developing our electroporation technologies and immunotherapies. Research and development expense consists of expenses incurred in performing research and development activities including salaries and benefits, facilities and other overhead expenses, clinical trials, contract services and other outside expenses. Our research and development expense was $94.2 million in 2020, $88.0 million in 2019 and $95.3 million in 2018.

Geographic Information

All of our revenue for the years ended December 31, 2020, 2019 and 2018 was earned in the United States. All of our long-lived assets are located in the United States.

Corporate Information

On December 31, 2020, our former wholly-owned subsidiaries Genetronics, Inc. and VGX Pharmaceuticals Inc. and our former majority -owned subsidiary VGX Animal Health, Inc. were merged into Inovio Pharmaceuticals, Inc.

Our corporate headquarters are located at 660 W. Germantown Pike, Suite 110, Plymouth Meeting, Pennsylvania 19462, and our main telephone number is (267) 440-4200.

Available Information

Our Internet website address is *www.inovio.com*. In addition to the information contained in this Annual Report, information about us can be found on our website. Our website and information included in or linked to our website are not part of this Annual Report.

We make our annual report on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K and amendments to those reports filed or furnished pursuant to Section 13(a) or 15(d) of the Securities Exchange Act of 1934, or the Exchange Act, available free of charge on our website as soon as reasonably practicable after we electronically file such material with, or furnish it to, the Securities and Exchange Commission, or the SEC. The SEC maintains an Internet site (www.sec.gov) that contains reports, proxy and information statements, and other information regarding issuers that file electronically with the SEC, including us.

Information regarding our corporate governance, including the charters of our audit committee, our nomination and corporate governance committee and our compensation committee, our Code of Business Conduct and Ethics, our Corporate Governance Guidelines, our Corporate Governance Policy and information for contacting our board of directors is available on our website.

Our Code of Business Conduct and Ethics includes our Code of Ethics applicable to our Chief Executive Officer and Chief Financial Officer, who also serves as our principal accounting officer. Any amendments to or waivers of the Code of Ethics will be promptly posted on our website or in a report on Form 8-K, as required by applicable law.

Employees and Human Capital Resources

As of February 12, 2021, we employed 262 people on a full-time basis. Of the combined total, 210 were in product research, which includes research and development, quality assurance, clinical, engineering and manufacturing, and 52 were in general and administrative functions, which includes corporate development, information technology, legal, investor relations, finance and corporate administration. About 50% of our workforce is comprised of women and approximately 50% is

comprised of individuals with ethnically diverse backgrounds. In addition, three of the seven members of our board of directors are women. None of our employees are subject to collective bargaining agreements. We consider our relationship with our employees to be good.

We compete in the highly competitive biotechnology industry. Attracting, developing and retaining talented people in research, quality assurance, clinical, engineering, manufacturing and other positions is crucial to executing our strategy and our ability to compete effectively. Our ability to recruit and retain such talent depends on several factors, including compensation and benefits, talent development and career opportunities, and work environment. To that end, we invest in our employees to be an employer of choice.

Employee Engagement

As we work to make an impact on how healthcare is delivered, we believe it is critical that our employees are informed and engaged. We communicate frequently and transparently with our employees through a variety of communication methods, including video and written communications, town hall meetings, employee surveys and our company intranet, and acknowledge individual contributions to INOVIO through several rewards and recognition award programs. We believe these engagement efforts keep employees informed about our strategy, culture and purpose and motivated to do their best work. As a result of the COVID-19 pandemic, we also further strengthened our digital communication platform. Our employee communications during the pandemic have kept our employees informed on critical priorities, important actions being taken by management in response to the pandemic.

Health, Safety and Wellness

The physical health, financial wellbeing, life balance and mental health of our employees is vital to our success.

The environmental, health and safety team stays abreast of local, regional and global concerns and trends and ensures safety procedures are in place to mitigate workplace injuries and safety risks. Employees are required to complete training in various safety procedures for the laboratories and manufacturing facilities and specialized safety training based on particular job duties. Designated Safety Officers and response teams oversee safety-related initiatives and a safety committee that provides input on safety procedures, practices, and policies. Employees are required to wear personal protective equipment relevant for their particular job duties. Occupational injuries at the workplace are extremely low and are always investigated to determine if any environmental or other changes need to be implemented.

Since the onset of the COVID-19 pandemic, strict safety protocols have been put in place for employees working on-site, including following federal and local guidelines and mandates to ensure the safety of the workforce. In addition to providing the necessary personal protective equipment, special engineering controls have been installed at the facilities to further protect workers. Regular communication and training about the virus and how individuals can protect themselves and others is ongoing with employees.

ITEM 1A. RISK FACTORS

You should carefully consider the following factors regarding information included in this Annual Report. The risks and uncertainties described below are not the only ones we face. Additional risks and uncertainties not presently known to us or that we currently deem immaterial also may impair our business operations. If any of the following risks actually occur, our business, financial condition and operating results could be materially adversely affected.

Risks Related to Our Financial Position and Need for Additional Capital

We have incurred significant losses in recent years, expect to incur significant net losses in the foreseeable future and may never become profitable.

We have experienced significant operating losses over the last several years. As of December 31, 2020 our accumulated deficit was $906.2 million. We have generated limited revenues, primarily consisting of license revenue, grant funding and interest income. We expect to continue to incur substantial additional operating losses for at least the next several years as we advance our clinical trials and research and development activities. We may never successfully commercialize our DNA vaccine and DNA immunotherapy product candidates or electroporation-based synthetic vaccine delivery technology and thus may never have any significant future revenues or achieve and sustain profitability.

We have limited sources of revenue and our success is dependent on our ability to develop our DNA vaccines, DNA immunotherapies, dMAbs and electroporation equipment.

We do not sell any products and may not have any other products commercially available for several years, if at all. Our ability to generate future revenues depends heavily on our success in:

- developing and securing United States and/or foreign regulatory approvals for our product candidates, including securing regulatory approval for conducting clinical trials with product candidates;
- developing our electroporation-based DNA delivery technology; and
- commercializing any products for which we receive approval from the FDA and foreign regulatory authorities.

Our electroporation equipment and product candidates will require extensive additional clinical study and evaluation, regulatory approval in multiple jurisdictions, substantial investment and significant marketing efforts before we generate any revenues from product sales. We are not permitted to market or promote our electroporation equipment and product candidates before we receive regulatory approval from the FDA or comparable foreign regulatory authorities. If we do not receive regulatory approval for and successfully commercialize any products, we will not generate any revenues from sales of electroporation equipment and products, and we may not be able to continue our operations.

We will need substantial additional capital to develop our DNA vaccines, DNA immunotherapies and dMAb programs and electroporation delivery technology.

Conducting the costly and time-consuming research, pre-clinical studies and clinical testing necessary to obtain regulatory approvals and bring our product candidates and delivery technology to market will require a commitment of substantial funds in excess of our current capital. Our future capital requirements will depend on many factors, including, among others:

- the progress of our current and new product development programs;
- the progress, scope and results of our pre-clinical and clinical testing;
- the time and cost involved in obtaining regulatory approvals;
- the cost of manufacturing our products and product candidates;
- the cost of prosecuting, enforcing and defending against patent infringement claims and other intellectual property rights;
- debt service obligations;
- competing technological and market developments; and
- our ability and costs to establish and maintain collaborative and other arrangements with third parties to assist in potentially bringing our products to market.

Additional financing may not be available on acceptable terms, or at all. Domestic and international capital markets have from time to time experienced heightened volatility and turmoil, particularly in light of the COVID-19 pandemic, making it more difficult in many cases to raise capital through the issuance of equity securities. Volatility in the capital markets can also negatively impact the cost and availability of credit, creating illiquid credit markets and wider credit spreads. Concern about the stability of the markets generally and the strength of counterparties specifically has led many lenders and institutional investors to reduce, and in some cases cease to provide, funding to borrowers. To the extent we are able to raise additional capital through

the sale of equity securities, or we issue securities in connection with another transaction in the future, the ownership position of existing stockholders could be substantially diluted. If additional funds are raised through the issuance of preferred stock or debt securities, these securities are likely to have rights, preferences and privileges senior to our common stock and may involve significant fees, interest expense, restrictive covenants and the granting of security interests in our assets. Fluctuating interest rates could also increase the costs of any debt financing we may obtain. Raising capital through a licensing or other transaction involving our intellectual property could require us to relinquish valuable intellectual property rights and thereby sacrifice long-term value for short-term liquidity.

Our failure to successfully address ongoing liquidity requirements would have a substantially negative impact on our business. If we are unable to obtain additional capital on acceptable terms when needed, we may need to take actions that adversely affect our business, our stock price and our ability to achieve cash flow in the future, including possibly surrendering our rights to some technologies or product opportunities, delaying our clinical trials or curtailing or ceasing operations.

Risks Related to Product Development, Manufacturing and Regulatory Approval

If we are unable to obtain FDA approval of our products, we will not be able to commercialize them in the United States.

We need FDA approval prior to marketing our electroporation equipment and product candidates in the United States. If we fail to obtain FDA approval to market our electroporation equipment and product candidates, we will be unable to sell our products in the United States, which will significantly impair our ability to generate any revenues.

This regulatory review and approval process, which includes evaluation of preclinical studies and clinical trials of our products as well as the evaluation of our manufacturing processes and our third-party contract manufacturers' facilities, is lengthy, expensive and uncertain. To receive approval, we must, among other things, demonstrate with substantial evidence from well-controlled clinical trials that our electroporation equipment and product candidates are both safe and effective for each indication for which approval is sought. To the extent that our product candidates are manufactured at multiple sites or using different processes, we will also need to demonstrate comparability across the manufacturing batches in order to obtain regulatory approval. Satisfaction of the approval requirements typically takes several years and the time needed to satisfy them may vary substantially, based on the type, complexity and novelty of the product. We do not know if or when we might receive regulatory approvals for our electroporation equipment and any of our product candidates currently under development. Moreover, any approvals that we obtain may not cover all of the clinical indications for which we are seeking approval, or could contain significant limitations in the form of narrow indications, warnings, precautions or contra-indications with respect to conditions of use. In such event, our ability to generate revenues from such products would be greatly reduced and our business would be harmed.

The FDA has substantial discretion in the approval process and may either refuse to consider our application for substantive review or may form the opinion after review of our data that our application is insufficient to allow approval of our electroporation equipment and product candidates. If the FDA does not consider or approve our application, it may require that we conduct additional clinical, preclinical or manufacturing validation studies and submit that data before it will reconsider our application. Depending on the extent of these or any other studies, approval of any applications that we submit may be delayed by several years, or may require us to expend more resources than we have available. It is also possible that additional studies, if performed and completed, may not be successful or considered sufficient by the FDA for approval or even to make our applications approvable. If any of these outcomes occur, we may be forced to abandon one or more of our applications for approval, which might significantly harm our business and prospects.

It is possible that none of our products or any product we may seek to develop in the future will ever obtain the appropriate regulatory approvals necessary for us or our collaborators to commence product sales. Any delay in obtaining, or an inability to obtain, applicable regulatory approvals would prevent us from commercializing our products, generating revenues and achieving and sustaining profitability.

Clinical trials involve a lengthy and expensive process with an uncertain outcome, and results of earlier studies and trials may not be predictive of future trial results.

Clinical testing is expensive and can take many years to complete, and its outcome is uncertain. Failure can occur at any time during the clinical trial process. The results of preclinical studies and early clinical trials of our products may not be predictive of the results of later-stage clinical trials. Results from one study may not be reflected or supported by the results of similar studies. Results of an animal study may not be indicative of results achievable in human studies. Human-use equipment and product candidates in later stages of clinical trials may fail to show the desired safety and efficacy traits despite having progressed through preclinical studies and initial clinical testing. The time required to obtain approval by the FDA and similar foreign authorities is unpredictable but typically takes many years following the commencement of clinical trials, depending upon numerous factors. In addition, approval policies, regulations, or the type and amount of clinical data necessary to gain approval may change. We have not obtained regulatory approval for any human-use products.

Our products could fail to complete the clinical trial process for many reasons, including the following:

- we may be unable to demonstrate to the satisfaction of the FDA or comparable foreign regulatory authorities that our electroporation equipment or product candidate is safe and effective for any indication;
- the results of clinical trials may not meet the level of statistical significance required by the FDA or comparable foreign regulatory authorities for approval;
- the FDA or comparable foreign regulatory authorities may disagree with the design or implementation of our clinical trials;
- we may not be successful in enrolling a sufficient number of participants in clinical trials;
- we may be unable to demonstrate that our electroporation equipment or product candidate's clinical and other benefits outweigh its safety risks;
- we may be unable to demonstrate that our electroporation equipment or product candidate presents an advantage over existing therapies, or over placebo in any indications for which the FDA requires a placebo-controlled trial;
- the FDA or comparable foreign regulatory authorities may disagree with our interpretation of data from preclinical studies or clinical trials;
- the data collected from clinical trials of our product candidates may not be sufficient to support the submission of a new drug application or other submission or to obtain regulatory approval in the United States or elsewhere;
- the FDA or comparable foreign regulatory authorities may fail to approve the manufacturing processes or facilities of us or third-party manufacturers with which we or our collaborators contract for clinical and commercial supplies; and
- the approval policies or regulations of the FDA or comparable foreign regulatory authorities may significantly change in a manner rendering our clinical data insufficient for approval.

Our product candidates are combination products regulated under both the biologic and device regulations of the Public Health Service Act and Federal Food, Drug, and Cosmetic Act. Third-party manufacturers may not be able to comply with cGMP regulations, regulations applicable to biologic/device combination products, including applicable provisions of the FDA's drug cGMP regulations, device cGMP requirements embodied in the QSR or similar regulatory requirements outside the United States. Our failure, or the failure of our third-party manufacturers, to comply with applicable regulations could result in sanctions being imposed on us, including clinical holds, fines, injunctions, civil penalties, delays, suspension or withdrawal of approvals, license revocation, seizures or recalls of product candidates, operating restrictions and criminal prosecutions, any of which could significantly affect supplies of our product candidates.

Clinical trials may also be delayed as a result of ambiguous or negative interim results. In addition, a clinical trial may be suspended or terminated by us, the FDA, the IRB overseeing the clinical trial at issue, any of our clinical trial sites with respect to that site, or other regulatory authorities due to a number of factors, including:

- failure to conduct the clinical trial in accordance with regulatory requirements or our clinical protocols;
- inspection of the clinical trial operations or trial sites by the FDA or other regulatory authorities resulting in the imposition of a clinical hold;
- unforeseen safety issues; and
- lack of adequate funding to continue the clinical trial.

If we experience delays in completion of, or if we terminate, any of our clinical trials, the commercial prospects for our electroporation equipment and our product candidates may be harmed and our ability to generate product revenues will be delayed. In addition, many of the factors that cause, or lead to, a delay in the commencement or completion of clinical trials may also ultimately lead to the denial of regulatory approval of a product candidate. Further, delays in the commencement or completion of clinical trials may adversely affect the trading price of our common stock.

Delays in the commencement or completion of clinical testing could result in increased costs to us and delay or limit our ability to generate revenues.

Delays in the commencement or completion of clinical testing could significantly affect our product development costs. We do not know whether planned clinical trials will begin on time or be completed on schedule, if at all. In addition, ongoing clinical trials may not be completed on schedule, or at all, and could be placed on a hold by the regulators for various reasons. The commencement and completion of clinical trials can be delayed for a number of reasons, including delays related to:

- obtaining regulatory approval to commence a clinical trial;
- adverse results from third party clinical trials involving gene-based therapies and the regulatory response thereto;
- reaching agreement on acceptable terms with prospective CROs and trial sites, the terms of which can be subject to extensive negotiation and may vary significantly among different CROs and trial sites;
- future bans or stricter standards imposed on clinical trials of gene-based therapy;
- manufacturing sufficient quantities of our electroporation equipment and product candidates for use in clinical trials;

- obtaining institutional review board, or IRB, approval to conduct a clinical trial at a prospective site;
- slower than expected recruitment and enrollment of patients to participate in clinical trials for a variety of reasons, including competition from other clinical trial programs for similar indications;
- conducting clinical trials with sites internationally due to regulatory approvals and meeting international standards;
- retaining patients who have initiated a clinical trial but may be prone to withdraw due to side effects from the therapy, lack of efficacy or personal issues, or who are lost to further follow-up;
- collecting, reviewing and analyzing our clinical trial data; and
- global unrest, global pathogen outbreaks or pandemics, terrorist activities, and economic and other external factors.

Clinical trials may also be delayed as a result of ambiguous or negative interim results. In addition, a clinical trial may be suspended or terminated by us, the FDA, the IRB overseeing the clinical trial at issue, any of our clinical trial sites with respect to that site, or other regulatory authorities due to a number of factors, including:

- failure to conduct the clinical trial in accordance with regulatory requirements or our clinical protocols;
- inspection of the clinical trial operations or trial sites by the FDA or other regulatory authorities resulting in the imposition of a clinical hold;
- unforeseen safety issues; and
- lack of adequate funding to continue the clinical trial.

If we experience delays in completion of, or if we terminate, any of our clinical trials, the commercial prospects for our electroporation equipment and our product candidates may be harmed and our ability to generate product revenues will be delayed. In addition, many of the factors that cause, or lead to, a delay in the commencement or completion of clinical trials may also ultimately lead to the denial of regulatory approval of a product candidate. Further, delays in the commencement or completion of clinical trials may adversely affect the trading price of our common stock.

None of our human vaccine candidates, including INO-4800, or our immunotherapy and DNA encoded monoclonal antibody product candidates have been approved for sale, and we may never develop commercially successful vaccine, immunotherapy or DNA encoded monoclonal antibody products.

Our human vaccine programs, which includes our COVID-19 vaccine candidate INO-4800, our immunotherapy programs and our DNA encoded monoclonal antibodies program are in various stages of research and development, and currently include product candidates in discovery, preclinical studies and Phase 1, 2 and 3 clinical trials. There are limited data regarding the efficacy of synthetic vaccine candidates and immunotherapy candidates compared with conventional vaccines, and we must conduct a substantial amount of additional research and development before the FDA or any comparable foreign regulatory authority will approve any of our vaccine product candidates, including INO-4800. The success of our efforts to develop and commercialize our product candidates, including INO-4800, could be delayed or fail for a number of reasons. For example, we could experience delays in product development and clinical trials. Our product candidates could be found to be ineffective or unsafe, or otherwise fail to receive necessary regulatory clearances to proceed with further clinical development or to be approved for marketing. Our products, even if they are deemed to be safe and effective by regulatory authorities, could be difficult to manufacture on a large scale or uneconomical to market, or our competitors could develop superior products more quickly and efficiently or more effectively market their competing products. The ability to manufacture sufficient quantities of INO-4800 on a large scale is particularly challenging and will require substantial resources and the engagement of third parties, which we may not be able to obtain on a timely basis, or at all.

In addition, adverse events, or the perception of adverse events, relating to vaccine and immunotherapy candidates and delivery technologies may negatively impact our ability to develop commercially successful products. For example, pharmaceutical companies have been subject to claims that the use of some pediatric vaccines has caused personal injuries, including brain damage, central nervous system damage and autism. These and other claims may influence public perception of the use of vaccine and immunotherapy products and could result in greater governmental regulation, stricter labeling requirements and potential regulatory delays in the testing or approval of our potential products.

Our planned clinical development of INO-4800 as a potential COVID-19 vaccine has been placed on partial clinical hold by the FDA, which may cause delays in the commencement of our planned Phase 3 clinical trial or completion of clinical testing, both of which could result in increased costs to us and delay or limit our ability to proceed to commercialization and generate revenues.

Our planned clinical development of INO-4800 as a potential COVID-19 vaccine has been placed on partial clinical hold by the FDA. We may not commence our planned Phase 3 clinical trial of INO-4800 until we satisfactorily resolve the FDA's remaining questions relating to our CELLECTRA 2000 delivery device to be used in connection with INO-4800 in our Phase 3 clinical trials and commercial product, if authorized or licensed by FDA. We are actively working to address the FDA's questions and plan to respond in May 2021, after which the FDA will have up to 30 days to notify us of its decision as to whether our Phase 3 trial may proceed. However, there can be no assurance regarding the timing of the FDA's agreement to lift the partial clinical hold or that we will ultimately be successful in obtaining any such determination from the FDA to do so.

Delays in the commencement of our Phase 3 trial or completion of ongoing clinical testing for INO-4800 could significantly affect our product development costs. We do not know whether our planned Phase 3 clinical trial will begin on time or be completed on schedule, if at all. In addition, our ongoing clinical trials for INO-4800 may not be completed on schedule, or at all, and could be placed on additional holds by regulators for reasons unrelated to our current hold. Our Phase 3 trial for INO-4800 will require interim data results at various points throughout the trial. Our clinical trials may therefore also be delayed as a result of ambiguous or negative interim results. Even if our interim results related to our INO-4800 are positive, there can be no assurance that our topline results will be consistent with the interim results. If we experience delays in completion of, or if we terminate, any of our clinical trials relating to INO-4800, the commercial prospects for our product candidate may be harmed and our ability to generate product revenues will be delayed. In addition, many of the factors that cause, or lead to, a delay in the commencement or completion of clinical trials may also ultimately lead to the denial of regulatory approval of a product candidate. Further, delays in the commencement or completion of clinical trials may adversely affect the trading price of our common stock.

Newly emerging SARS-CoV-2 variants could reduce the immunogenicity and effectiveness of INO-4800 as a potential COVID-19 vaccine.

Multiple variants of the virus that causes COVID-19 have been documented in the United States and globally during this pandemic. The new SARS-CoV-2 variants could be less affected by the immune responses generated by INO-4800 in the vaccine recipients and therefore could reduce the overall efficacy of the vaccine in controlling severe COVID-19 disease.

There can be no assurance that the product we are developing for COVID-19 would be granted an Emergency Use Authorization by the FDA or similar authorization by regulatory authorities outside of the United States if we were to decide to apply for such an authorization. If we do not apply for such an authorization or, if we do apply and no authorization is granted or, once granted, it is terminated, we will be unable to sell our product in the near future and instead, will be required to pursue the biologic licensure process in order to sell our product, which is lengthy and expensive.

We may seek an Emergency Use Authorization, or EUA, from the FDA or similar authorization from regulatory authorities outside of the United States, such as conditional marketing authorization from the EMA. If we apply for an EUA and it is granted, an EUA will authorize us to market and sell our COVID-19 vaccine under certain conditions of authorization as long as the public health emergency exists. The FDA expects that companies which receive an EUA for COVID-19 vaccines will proceed to licensure of their vaccine products under a full Biologics License Application. The FDA may issue an EUA during a Public Health Emergency if the agency determines that the potential benefits of a product outweigh the potential risks and if other regulatory criteria are met. There is no guarantee that we will apply for an EUA or other similar authorization or, if we do apply, that we will be able to obtain such authorization. If an EUA or other authorization is granted, we will rely on the FDA or other applicable regulatory authority policies and guidance governing vaccines authorized in this manner in connection with the marketing and sale of our product. If these policies and guidance change unexpectedly and/or materially or if we misinterpret them, potential sales of our product could be adversely impacted. An EUA authorizing the marketing and sale of our product will terminate upon expiration of the Public Health Emergency, which is a determination made by the Secretary of Health and Human Services. The FDA may also terminate an EUA if safety issues or other concerns about our product arise or if we fail to comply with the conditions of authorization. If we apply for an EUA or similar authorization from regulatory authorities outside of the United States, the failure to obtain such authorization or the termination of such an authorization, if obtained, would adversely impact our ability to market and sell our COVID-19 vaccine, which could adversely impact our business, financial condition and results of operations.

If we and the contract manufacturers upon whom we rely fail to produce our electroporation devices and product candidates in the volumes that we require on a timely basis, or at all, or fail to comply with their obligations to us or with stringent regulations, we may face delays in the development and commercialization of our electroporation equipment and product candidates.

We manufacture some components of our electroporation devices and utilize the services of contract manufacturers to manufacture the remaining components of these devices. We also rely on third party contract manufacturers to produce our product candidates for use in our clinical trials and potentially for commercial distribution, if any product candidate is approved by regulatory authorities. The manufacture of these devices and our product candidates requires significant expertise and capital investment, including the development of advanced manufacturing techniques and process controls. Manufacturers often encounter difficulties in production, particularly in scaling up for commercial production. These problems include difficulties with production costs and yields, quality control, including stability of the equipment and product candidates and quality assurance testing, shortages of qualified personnel, as well as compliance with strictly enforced federal, state and foreign regulations.

If we or our manufacturers were to encounter any of these difficulties or our manufacturers otherwise fail to comply with their obligations to us, our ability to provide our electroporation equipment to our partners and to supply product candidates for clinical trials or to commercially launch a product would be jeopardized. For example, we previously relied on VGXI to manufacture DNA plasmids for our product candidates, including INO-4800. In 2020, VGXI notified us that they would be

unable to produce the necessary plasmids to meet this timeline due to a lack of manufacturing capacity. As a result, we have engaged several additional third-party contract manufacturers to support the planned large-scale manufacturing of INO-4800. However, there can be no assurance that we will be able to secure adequate additional manufacturing capacity on commercially reasonable terms. Our inability to secured sufficient manufacturing capacity, or our inability to transfer necessary manufacturing know-how to third parties, would adversely affect our commercialization plans and could also harm our reputation.

Furthermore, any delay or interruption in the supply of clinical trial supplies for INO-4800 or any of our other product candidates could delay the completion of our clinical trials, increase the costs associated with maintaining our clinical trial program and, depending upon the period of delay, require us to commence new trials at significant additional expense or terminate the trials completely.

In addition, all manufacturers of our products must comply with cGMP requirements enforced by the FDA through its facilities inspection program. These requirements include, among other things, quality control, quality assurance and the generation and maintenance of records and documentation. Manufacturers of our products may be unable to comply with these cGMP requirements and with other FDA, state and foreign regulatory requirements. We have little control over our manufacturers' compliance with these regulations and standards. A failure to comply with these requirements may result in fines and civil penalties, suspension of production, suspension or delay in product approval, product seizure or recall, or withdrawal of product approval. If the safety of any product is compromised due to our or our manufacturers' failure to adhere to applicable laws or for other reasons, we may not be able to obtain regulatory approval for or successfully commercialize our products, and we may be held liable for any injuries sustained as a result. Any of these factors could cause a delay of clinical trials, regulatory submissions, approvals or commercialization of our products, entail higher costs or result in our being unable to effectively commercialize our products. Furthermore, if our manufacturers fail to deliver the required commercial quantities on a timely basis, pursuant to provided specifications and at commercially reasonable prices, we may be unable to meet demand for our products and would lose potential revenues.

Even if our products receive regulatory approval, they may still face future development and regulatory difficulties.

Even if United States regulatory approval is obtained, the FDA may still impose significant restrictions on a product's indicated uses or marketing or impose ongoing requirements for potentially costly post-approval studies. This governmental oversight may be particularly strict with respect to gene-based therapies. Our products will also be subject to ongoing FDA requirements governing the labeling, packaging, storage, advertising, promotion, record keeping and submission of safety and other post-market information. For example, the FDA strictly regulates the promotional claims that may be made about medical products. In particular, a product may not be promoted for uses that are not approved by the FDA as reflected in the product’s approved labeling. Physicians, on the other hand, may prescribe products for off-label uses. Although the FDA and other regulatory agencies do not regulate a physician’s choice of drug treatment made in the physician’s independent medical judgment, they do restrict promotional communications from companies or their sales force with respect to off-label uses of products for which marketing clearance has not been issued. However, companies may in certain circumstances share truthful and not misleading information that is otherwise consistent with the product’s FDA approved labeling. In addition, manufacturers of drug products and their facilities are subject to continual review and periodic inspections by the FDA and other regulatory authorities for compliance with current good manufacturing practices, or cGMP, regulations. If we or a regulatory agency discover previously unknown problems with a product, such as adverse events of unanticipated severity or frequency, or problems with the facility where the product is manufactured, a regulatory agency may impose restrictions on that product, the manufacturer or us, including requiring withdrawal of the product from the market or suspension of manufacturing. If we, our product candidates or the manufacturing facilities for our product candidates fail to comply with applicable regulatory requirements, a regulatory agency may:

- issue Warning Letters or untitled letters;
- impose civil or criminal penalties;
- suspend regulatory approval;
- suspend any ongoing clinical trials;
- refuse to approve pending applications or supplements to applications filed by us;
- impose restrictions on operations, including costly new manufacturing requirements; or
- seize or detain products or require us to initiate a product recall.

Even if our products receive regulatory approval in the United States, we may never receive approval or commercialize our products outside of the United States.

In order to market any electroporation equipment and product candidates outside of the United States, we must establish and comply with numerous and varying regulatory requirements of other countries regarding safety and efficacy. Approval procedures vary among countries and can involve additional product testing and additional administrative review periods. The

time required to obtain approval in other countries might differ from that required to obtain FDA approval. The regulatory approval process in other countries may include all of the risks detailed above regarding FDA approval in the United States as well as other risks. Regulatory approval in one country does not ensure regulatory approval in another, but a failure or delay in obtaining regulatory approval in one country may have a negative effect on the regulatory process in others. Failure to obtain regulatory approval in other countries or any delay or setback in obtaining such approval could have the same adverse effects detailed above regarding FDA approval in the United States. Such effects include the risks that our product candidates may not be approved for all indications requested, which could limit the uses of our product candidates and have an adverse effect on their commercial potential or require costly, post-marketing follow-up studies.

We have obtained Orphan Drug Designation for one of our product candidates. As part of our business strategy, we may continue to seek Orphan Drug Designation for additional product candidates, and we may be unsuccessful in obtaining new designations or may be unable to obtain or maintain the benefits associated with Orphan Drug Designation, including the potential for orphan drug exclusivity.

We have obtained Orphan Drug Designation from the FDA for INO-3107 for the treatment of for the treatment of recurrent respiratory papillomatosis. We have sought and may continue to seek Orphan Drug Designation for one or more of our other product candidates, including but not limited to VGX-3100 for the treatment of HPV-16-/18-associated anal dysplasia, although we may be unsuccessful in doing so. Regulatory authorities in some jurisdictions, including the United States and Europe, may designate drugs for relatively small patient populations as orphan drugs. Under the Orphan Drug Act, the FDA may designate a drug as an orphan drug if it is a drug intended to treat a rare disease or condition, which is generally defined as a patient population of fewer than 200,000 individuals in the United States, or a patient population greater than 200,000 in the United States where there is no reasonable expectation that the cost of developing the drug will be recovered from sales in the United States. In the United States, Orphan Drug Designation entitles a party to financial incentives such as tax advantages and user fee waivers. Opportunities for grant funding toward clinical trial costs may also be available for clinical trials of drugs for rare diseases, regardless of whether the drugs are designated for the orphan use. In addition, if a product that has Orphan Drug Designation subsequently receives the first FDA approval for the disease for which it has such designation, the product is entitled to orphan drug exclusivity, which means that the FDA may not approve any other applications to market the same product for the same indication for seven years, except in limited circumstances.

Although we have obtained Orphan Drug Designation for INO-3107 for the treatment of for the treatment of recurrent respiratory papillomatosis, and even if we obtain Orphan Drug Designation for our other product candidates in specific indications, we may not be the first to obtain marketing approval of these product candidates for the orphan-designated indication due to the uncertainties associated with developing pharmaceutical products. If a competitor with a product that is determined by the FDA to be the same as one of our product candidates obtains marketing approval before us for the same indication we are pursuing and obtains orphan drug exclusivity, our product candidate may not be approved until the period of exclusivity ends unless we are able to demonstrate that our product candidate is clinically superior. Even after obtaining approval, we may be limited in our ability to market our product. In addition, exclusive marketing rights in the United States may be limited if we seek approval for an indication broader than the orphan-designated indication or may be lost if the FDA later determines that the request for designation was materially defective or if the manufacturer is unable to assure sufficient quantities of the product to meet the needs of patients with the rare disease or condition. Further, even if we obtain orphan drug exclusivity for a product, that exclusivity may not effectively protect the product from competition because different drugs with different principal molecular structural features can be approved for the same condition. Even after an orphan product is approved, the FDA can subsequently approve the same drug with the same principal molecular structural features for the same condition if the FDA concludes that the later drug is safer, more effective or makes a major contribution to patient care. Orphan Drug Designation neither shortens the development time or regulatory review time of a drug nor gives the drug any advantage in the regulatory review or approval process. In addition, while we may seek Orphan Drug Designation for some of our product candidates, we may never receive such designations.

Tax reform legislation enacted in 2017 reduced the amount of the qualified clinical research costs for a designated orphan product that a sponsor may claim as a credit from 50% to 25%. This reduction could further limit the advantage of, and may impact our future business strategy with respect to, seeking the Orphan Drug Designation.

Risks Related to Reliance on Third Parties

If we lose or are unable to secure collaborators or partners, or if our collaborators or partners do not apply adequate resources to their relationships with us, our product development and potential for profitability will suffer.

We have entered into, and may continue to enter into, distribution, co-promotion, partnership, sponsored research and other arrangements for development, manufacturing, sales, marketing and other commercialization activities relating to our products. For example, in the past we have entered into license and collaboration agreements to develop, obtain regulatory approval for and commercialize our product candidates for specified indications, including in jurisdictions outside of the United States. The amount and timing of resources applied by our collaborators are largely outside of our control.

If any of our current or future collaborators breaches or terminates our agreements, or fails to conduct our collaborative activities in a timely manner, our commercialization of products could be diminished or blocked completely. We may not receive any event-based payments, milestone payments or royalty payments under our collaborative agreements if our collaborative partners fail to develop products in a timely manner or at all. It is possible that collaborators will change their strategic focus, pursue alternative technologies or develop alternative products, either on their own or in collaboration with others. Further, we may be forced to fund programs that were previously funded by our collaborators, and we may not have, or be able to access, the necessary funding. The effectiveness of our partners, if any, in marketing our products will also affect our revenues and earnings.

We desire to enter into new collaborative agreements. However, we may not be able to successfully negotiate any additional collaborative arrangements and, if established, these relationships may not be scientifically or commercially successful. Our success in the future depends in part on our ability to enter into agreements with other highly-regarded organizations. This can be difficult due to internal and external constraints placed on these organizations. Some organizations may have insufficient administrative and related infrastructure to enable collaborations with many companies at once, which can extend the time it takes to develop, negotiate and implement a collaboration. Once news of discussions regarding possible collaborations are known in the medical community, regardless of whether the news is accurate, failure to announce a collaborative agreement or the entity's announcement of a collaboration with another entity may result in adverse speculation about us, resulting in harm to our reputation and our business.

Disputes could also arise between us and our existing or future collaborators, as to a variety of matters, including financial and intellectual property matters or other obligations under our agreements. These disputes could be both expensive and time-consuming and may result in delays in the development and commercialization of our products or could damage our relationship with a collaborator.

A small number of licensing partners and government contracts account for a substantial portion of our revenue.

We currently derive, and in the past we have derived, a significant portion of our revenue from a limited number of licensing partners and government grants and contracts. Revenue can fluctuate significantly depending on the timing of upfront and event-based payments and work performed. If we fail to sign additional future contracts with major licensing partners and the government, if a contract is delayed or deferred, or if an existing contract expires or is canceled and we fail to replace the contract with new business, our revenue would be adversely affected.

We have agreements with government agencies, which are subject to termination and uncertain future funding.

We have entered into agreements with government agencies, such as the NIAID, DARPA and the DoD, and we intend to continue entering into these types of agreements in the future. Our business is partially dependent on the continued performance by these government agencies of their responsibilities under these agreements, including adequate continued funding of the agencies and their programs. We have no control over the resources and funding that government agencies may devote to these agreements, which may be subject to annual renewal and which generally may be terminated by the government agencies at any time.

Government agencies may fail to perform their responsibilities under these agreements, which may cause them to be terminated by the government agencies. In addition, we may fail to perform our responsibilities under these agreements. Many of our government agreements are subject to audits, which may occur several years after the period to which the audit relates. If an audit identifies significant unallowable costs, we could incur a material charge to our earnings or reduction in our cash position. As a result, we may be unsuccessful entering, or ineligible to enter, into future government agreements.

We and our collaborators rely on third parties to conduct our clinical trials. If these third parties do not successfully carry out their contractual duties or meet expected deadlines, we and our collaborators may not be able to obtain regulatory approval for or commercialize our product candidates.

We and our collaborators have entered into agreements with CROs to provide monitors for and to manage data for our on-going clinical programs. We and the CROs conducting clinical trials for our electroporation equipment and product candidates are required to comply with current good clinical practices, or GCPs, regulations and guidelines enforced by the FDA for all of our products in clinical development. The FDA enforces GCPs through periodic inspections of trial sponsors, principal investigators and trial sites. If we or the CROs conducting clinical trials of our product candidates fail to comply with applicable GCPs, the clinical data generated in the clinical trials may be deemed unreliable and the FDA may require additional clinical trials before approving any marketing applications.

If any relationships with CROs terminate, we or our collaborators may not be able to enter into arrangements with alternative CROs. In addition, these third-party CROs are not our employees, and we cannot control whether or not they devote sufficient time and resources to our on-going clinical programs or perform trials efficiently. These CROs may also have relationships with other commercial entities, including our competitors, for whom they may also be conducting clinical studies or other drug development activities, which could harm our competitive position. If CROs do not successfully carry out their

contractual duties or obligations or meet expected deadlines, if they need to be replaced, or if the quality or accuracy of the clinical data they obtain is compromised due to the failure to adhere to our clinical protocols, regulatory requirements, or for other reasons, our clinical trials may be extended, delayed or terminated, and we may not be able to obtain regulatory approval for or successfully commercialize our product candidates. As a result, our financial results and the commercial prospects for our product candidates would be harmed, our costs could increase and our ability to generate revenues could be delayed. Cost overruns by or disputes with our CROs may significantly increase our expenses.

Risks Related to Commercialization of Our Product Candidates

We currently have no marketing and sales organization. If we are unable to establish marketing and sales capabilities or enter into agreements with third parties to market and sell our products, we may not be able to generate product revenues.

We currently do not have a sales organization for the marketing, sales and distribution of our electroporation equipment and product candidates. In order to commercialize any products, we must build our marketing, sales, distribution, managerial and other non-technical capabilities or make arrangements with third parties to perform these services. We contemplate establishing our own sales force or seeking third-party partners to sell our products. The establishment and development of our own sales force to market any products we may develop will be expensive and time consuming and could delay any product launch, and we may not be able to successfully develop this capability. We will also have to compete with other pharmaceutical and biotechnology companies to recruit, hire, train and retain marketing and sales personnel. To the extent we rely on third parties to commercialize our approved products, if any, we will receive lower revenues than if we commercialized these products ourselves. In addition, we may have little or no control over the sales efforts of third parties involved in our commercialization efforts. In the event we are unable to develop our own marketing and sales force or collaborate with a third-party marketing and sales organization, we would not be able to commercialize our product candidates which would negatively impact our ability to generate product revenues.

If products for which we receive regulatory approval do not achieve broad market acceptance, the revenues that we generate from their sales will be limited.

The commercial success of our electroporation equipment and product candidates for which we obtain marketing approval from the FDA or other regulatory authorities will depend upon the acceptance of these products by both the medical community and patient population. Coverage and reimbursement of our product candidates by third-party payors, including government payors, generally is also necessary for optimal commercial success. The degree of market acceptance of any of our approved products will depend on a number of factors, including:

- our ability to provide acceptable evidence of safety and efficacy;
- the relative convenience and ease of administration;
- the prevalence and severity of any actual or perceived adverse side effects;
- limitations or warnings contained in a product's FDA-approved labeling, including, for example, potential “black box” warnings
- availability of alternative treatments;
- pricing and cost effectiveness;
- the effectiveness of our or any future collaborators' sales and marketing strategies;
- the public perception of new therapies and the reputational challenges that the vaccine industry is facing related to the growing momentum of the anti-vaccine movement;
- our ability to obtain sufficient third-party coverage and adequate reimbursement; and
- the willingness of patients to pay out of pocket in the absence of third-party coverage.

If our electroporation equipment and product candidates are approved but do not achieve an adequate level of acceptance by physicians, healthcare payors and patients, we may not generate sufficient revenue from these products, and we may not become or remain profitable. In addition, our efforts to educate the medical community and third-party payors on the benefits of our product candidates may require significant resources and may never be successful.

We are subject to uncertainty relating to coverage and reimbursement policies which, if not favorable to our product candidates, could hinder or prevent our products' commercial success.

Patients in the United States and elsewhere generally rely on third-party payors to reimburse part or all of the costs associated with their prescription drugs and medical treatments. Accordingly, our ability to commercialize our electroporation equipment and product candidates successfully will depend in part on the extent to which governmental authorities, including Medicare and Medicaid, private health insurers and other third-party payors establish appropriate coverage and reimbursement levels for our product candidates and related treatments. As a threshold for coverage and reimbursement, third-party payors generally require that drug products have been approved for marketing by the FDA.

Significant uncertainty exists as to the coverage and reimbursement status of any products for which we may obtain regulatory approval. Coverage decisions may not favor new products when more established or lower cost therapeutic alternatives are already available. Even if we obtain coverage for a given product, the associated reimbursement rate may not be adequate to cover our costs, including research, development, intellectual property, manufacture, sale and distribution expenses, or may require co-payments that patients find unacceptably high. Patients are unlikely to use our products unless reimbursement is adequate to cover all or a significant portion of the cost of our drug products.

Additionally, some of our products, if approved, will be provided under the supervision of a physician. When used in connection with medical procedures, our product candidates may not be reimbursed separately but their cost may instead be bundled as part of the payment received by the provider for the procedure only. Separate reimbursement for the product itself or the treatment or procedure in which our product is used may not be available. A decision by a third-party payor not to cover or separately reimburse for our product candidates or procedures using our product candidates, could reduce physician utilization of our products once approved.

Coverage and reimbursement policies for drug products can differ significantly from payor to payor as there is no uniform policy of coverage and reimbursement for drug products among third-party payors in the United States. There may be significant delays in obtaining coverage and reimbursement as the process of determining coverage and reimbursement is often time consuming and costly which will require us to provide scientific and clinical support for the use of our products to each payor separately, with no assurance that coverage or adequate reimbursement will be obtained. It is difficult to predict at this time what government authorities and third-party payors will decide with respect to coverage and reimbursement for our products.

A significant trend in the U.S. healthcare industry and elsewhere is cost containment. Third-party payors have attempted to control costs by limiting coverage and the amount of reimbursement for particular products and services. Third-party payors are increasingly challenging the effectiveness of and prices charged for medical products and services. Moreover, the U.S. government, state legislatures and foreign governmental entities have shown significant interest in implementing cost containment programs to limit the growth of government paid healthcare costs, including price controls, restrictions on reimbursement and coverage and requirements for substitution of generic products for branded prescription drugs. We may not be able to obtain third-party payor coverage or reimbursement for our products in whole or in part.

Risks Related to Managing Our Growth and Employee and Operational Matters

We are currently subject to litigation and may become subject to additional litigation, which could harm our business, financial condition and reputation.

We may have actions brought against us by stockholders relating to past transactions, changes in our stock price or other matters. For example, during 2020, numerous purported shareholder class action complaints have been filed against us, naming us and our directors and executive officers as defendants, and alleging that we made materially false and misleading statements regarding the development of our INO-4800 vaccine candidate against COVID-19 in violation of certain federal securities laws. We may also become party to litigation with third parties as a result of our business activities. In 2020, we filed a lawsuit against one of our contract manufacturers, who then filed a counterclaim against us alleging that we had breached our contract with them, among other claims. These litigation matters, described in this report, are ongoing, and even though we intend to vigorously defend ourselves in these actions, there can be no assurance that we will ultimately prevail. These and any potential future actions against us could give rise to substantial damages, which could have a material adverse effect on our financial position, liquidity or results of operations. Even if an action is not resolved against us, the uncertainty and expense associated with litigation could harm our business, financial condition and reputation, as litigation is often costly, time-consuming and disruptive to business operations. The defense of our existing and potential future lawsuits could also result in diversion of our management's time and attention away from business operations, which could harm our business.

Our business could be adversely affected by the effects of health epidemics, including the global COVID-19 pandemic.

In December 2019, a novel strain of coronavirus, since named SARS-CoV-2, causing the disease known as COVID-19, was reported in China. Since then, COVID-19 has spread globally, resulting in the World Health Organization (WHO) declaring the outbreak of COVID-19 as a “pandemic” in March 2020 and United States also declaring a national emergency. In response to the COVID-19 pandemic, a number of governmental orders and other public health guidance measures were implemented across much of the United States, including in the locations of our offices, laboratories, clinical trial sites and third parties on whom we rely. As a result, our expected clinical development timelines could be negatively affected by COVID-19, which could then materially and adversely affect our business, financial condition and results of operations. Further, we have implemented a work from home policy allowing employees who can work from home to do so, while those needing to work in laboratory facilities work in shifts to reduce the number of people gathered together at one time. Business travel has been suspended and online and teleconference technology is used to meet virtually rather than in person. We have taken measures to secure our research and development project activities, while work in laboratories has been organized to reduce risk of COVID-19 transmission. Our increased reliance on personnel working from home may negatively impact our productivity, or

could disrupt, delay or otherwise adversely impact our business. For example, with our personnel working from home, some of our research activities that require our personnel to be in our laboratories could be delayed.

In addition, as local jurisdictions continue to put restrictions in place, our ability to continue to conduct and enroll patients in our clinical trials, manufacture our product candidates and pursue collaborations may also be limited. Such events may result in business and manufacturing disruption, and in reduced operations, any of which could materially affect our business, financial condition and results of operations.

The spread of COVID-19, which has caused a broad impact globally, could also affect us economically. While the potential economic impact brought by, and the duration of, COVID-19 may be difficult to assess or predict, it has resulted in significant disruption of global financial markets, which could reduce our ability to access capital. Although we have raised significant funds from the sale of our common stock in the public markets during the pandemic, there can be no guarantee that we will be able to continue to so, which could negative affect our future liquidity. In addition, if a global economic recession results following the spread of COVID-19, its impact could materially affect our business and the value of our common stock.

The continued spread of COVID-19 globally has and could continue to adversely affect our clinical trial operations, including our ability to initiate and conduct our planned trials on their expected timelines and to recruit and retain patients and principal investigators and site staff who, as healthcare providers, may have heightened exposure to COVID-19 if an outbreak occurs in their geography. For example, COVID-19 has adversely impacted the timeline for data collection for our VGX-3100 program. An increasing number of trial participants are either not able or do not feel safe going into healthcare facilities, which is necessary for the collection and completion of data samples for this trial. These concerns are magnified by increasing COVID-19 infection rates, surges in cases globally, and lockdowns now occurring in Europe. As a result, it is taking longer than anticipated to complete the data collection process. Further, the COVID-19 outbreak could result in delays in our clinical trials due to prioritization of hospital resources toward the outbreak, restrictions in travel, potential unwillingness of patients to enroll in trials, patients withdrawing from trials following enrollment as a result of contracting COVID-19 or other health conditions, or the inability of patients to comply with clinical trial protocols as quarantines and travel restrictions impede patient movement or interrupt healthcare services. In addition, we rely on independent clinical investigators, contract research organizations and other third-party service providers to assist us in managing, monitoring and otherwise carrying out our preclinical studies and clinical trials, and the outbreak may affect their ability to devote sufficient time and resources to our programs or to travel to sites to perform work for us. These restrictions may delay the conduct of multiple clinical trials including our Phase 1 through 3 clinical trials.

Additionally, COVID-19 may also result in delays in receiving approvals from local and foreign regulatory authorities, delays in necessary interactions with local and foreign regulators, ethics committees and other important agencies and contractors due to limitations in employee resources or forced furlough of government employees, and refusals to accept data from clinical trials conducted in these affected geographies.

The global outbreak of COVID-19 continues to rapidly evolve. The extent to which COVID-19 may impact our business, operations and clinical trials will depend on future developments, including the duration of the outbreak, travel restrictions and social distancing in the United States and other countries, the effectiveness of actions taken in the United States and other countries to contain and treat the disease and whether the United States and additional countries are required to move to complete lock-down status. The ultimate long-term impact of COVID-19 is highly uncertain.

We face intense and increasing competition and many of our competitors have significantly greater resources and experience.

If any of our competitors develop products with efficacy or safety profiles significantly better than our products, we may not be able to commercialize our products, and sales of any of our commercialized products could be harmed. Some of our competitors and potential competitors have substantially greater product development capabilities and financial, scientific, marketing and human resources than we do. Competitors may develop products earlier, obtain FDA approvals for products more rapidly, or develop products that are more effective than those under development by us. We will seek to expand our technological capabilities to remain competitive; however, research and development by others may render our technologies or products obsolete or noncompetitive, or result in treatments or cures superior to ours.

Many other companies are pursuing other forms of treatment or prevention for diseases that we target. For example, many of our competitors are working on developing and testing COVID-19 vaccines, cancer vaccines and immunotherapies, and several products such as the CAR-Ts developed by our competitors have been approved for human use. Some of our competitors have already received regulatory approval for their COVID-19 vaccines and have begun distribution in our target markets. The earlier market entry of these other vaccines, and their actual or perceived efficacious or success relative to our own, may lead to diversion of funding away from us, decreased demand for INO-4800, if approved, and difficulty in finding participants for our clinical trials. All of these factors could substantially impact our ability to complete the development of, commercialize and generate revenues from INO-4800.

In addition, our competitors and potential competitors include large pharmaceutical and more established biotechnology companies. These companies have significantly greater financial and other resources and greater expertise than us in research and development, securing government contracts and grants to support research and development efforts, manufacturing, preclinical and clinical testing, obtaining regulatory approvals and marketing. This may make it easier for them to respond more quickly than us to new or changing opportunities, technologies or market needs. Many of these competitors operate large, well-funded research and development programs and have significant products approved or in development. Small companies may also prove to be significant competitors, particularly through collaborative arrangements with large pharmaceutical companies or through acquisition or development of intellectual property rights. Our potential competitors also include academic institutions, governmental agencies and other public and private research organizations that conduct research, seek patent protection and establish collaborative arrangements for product and clinical development and marketing. Research and development by others may seek to render our technologies or products obsolete or noncompetitive.

Our failure to successfully acquire, develop and market additional product candidates or approved products would impair our ability to grow.

We may acquire, in-license, develop and/or market additional products and product candidates. The success of these actions depends partly upon our ability to identify, select and acquire promising product candidates and products.

The process of proposing, negotiating and implementing a license or acquisition of a product candidate or approved product is lengthy and complex. Other companies, including some with substantially greater financial, marketing and sales resources, may compete with us for the license or acquisition of product candidates and approved products. We have limited resources to identify and execute the acquisition or in-licensing of third-party products, businesses and technologies and integrate them into our current infrastructure. Moreover, we may devote resources to potential acquisitions or in-licensing opportunities that are never completed, or we may fail to realize the anticipated benefits of such efforts. We may not be able to acquire the rights to additional product candidates on terms that we find acceptable, or at all.

In addition, future acquisitions may entail numerous operational and financial risks, including:

- exposure to unknown liabilities;
- disruption of our business and diversion of our management's time and attention to develop acquired products or technologies;
- incurrence of substantial debt or dilutive issuances of securities to pay for acquisitions;
- higher than expected acquisition and integration costs;
- increased amortization expenses;
- difficulty and cost in combining the operations and personnel of any acquired businesses with our operations and personnel;
- impairment of relationships with key suppliers or customers of any acquired businesses due to changes in management and ownership; and
- inability to retain key employees of any acquired businesses.

Further, any product candidate that we acquire may require additional development efforts prior to commercial sale, including extensive clinical testing and approval by the FDA and applicable foreign regulatory authorities. All product candidates are prone to risks of failure typical of product development, including the possibility that a product candidate will not be shown to be sufficiently safe and effective for approval by regulatory authorities.

We depend upon key personnel who may terminate their employment with us at any time and we may need to hire additional qualified personnel in order to obtain financing, pursue collaborations or develop or market our product candidates.

The success of our business strategy will depend to a significant degree upon the continued services of key management, technical and scientific personnel and our ability to attract and retain additional qualified personnel and managers, including personnel with expertise in clinical trials, government regulation, manufacturing, marketing and other areas. Competition for qualified personnel is intense among companies, academic institutions and other organizations. If we are unable to attract and retain key personnel and advisors, it may negatively affect our ability to successfully develop, test, commercialize and market our products and product candidates.

Changes in funding for the FDA and other government agencies could hinder our ability to hire and retain key leadership and other personnel, or otherwise prevent new products from being developed or commercialized in a timely manner, which could negatively impact our business.

The ability of the FDA to review and approve new products can be affected by a variety of factors, including government budget and funding levels, ability to hire and retain key personnel and accept the payment of user fees, and statutory, regulatory, and policy changes. Average review times at the agency have fluctuated in recent years as a result. In addition,

government funding of other government agencies that fund research and development activities is subject to the political process, which is inherently fluid and unpredictable.

Disruptions at the FDA and other agencies may also slow the time necessary for new drugs to be reviewed and/or approved by necessary government agencies, which would adversely affect our business. For example, over the last several years, including for 35 days from December 2018 to January 2019, the U.S. government has shut down several times and certain regulatory agencies, such as the FDA, have had to furlough critical FDA employees and stop critical activities. If a prolonged government shutdown occurs, it could significantly impact the ability of the FDA to timely review and process our regulatory submissions, which could have a material adverse effect on our business.

We are dependent on information technology and our systems and infrastructure face certain risks, including from cybersecurity breaches and data leakage.

We rely to a large extent upon sophisticated information technology systems to operate our businesses, some of which are managed, hosted provided and/or used for third-parties or their vendors. We collect, store and transmit large amounts of confidential information (including personal information and pseudonymized information), and we deploy and operate an array of technical and procedural controls to maintain the confidentiality and integrity of such confidential information. A significant breakdown, invasion, corruption, destruction, interruption, or unavailability of critical information technology systems or infrastructure, by our workforce, others with authorized access to our systems or unauthorized persons could negatively impact operations. Hardware, software, or applications we develop or obtain from third parties may contain defects in design or manufacture or other supply chain problems that could unexpectedly compromise our information and network security. The ever-increasing use and evolution of technology, including cloud-based computing, creates opportunities for the unintentional dissemination or intentional destruction of confidential information stored in our or our third-party providers' systems, portable media or storage devices. We could also experience a business interruption, theft of confidential information or reputational damage from industrial espionage attacks, malware or other cyber-attacks (including ransomware), which may compromise our system infrastructure or lead to data leakage, either internally or at our third-party providers. While we have invested in the protection of data and information technology, there can be no assurance that our efforts will prevent service interruptions or security breaches. Any such interruption or breach of our systems could adversely affect our business operations and/or result in the loss of critical or sensitive confidential information or intellectual property, and could result in financial, legal, business and reputational harm to us. In addition, as the regulatory environment related to information security, data collection and use, and privacy becomes increasingly rigorous, with new and constantly changing requirements applicable to our business, compliance with those requirements could also result in additional costs.

We face potential product liability exposure and, if successful claims are brought against us, we may incur substantial liability.

The use of our electroporation equipment and DNA vaccine, DNA immunotherapy and dMAb candidates in clinical trials and the sale of any products for which we obtain marketing approval expose us to the risk of product liability claims. Product liability claims might be brought against us by consumers, healthcare providers, pharmaceutical companies or others selling or otherwise coming into contact with our products. For example, pharmaceutical companies have been subject to claims that the use of some pediatric vaccines has caused personal injuries, including brain damage, central nervous system damage and autism, and these companies have incurred material costs to defend these claims. If we cannot successfully defend ourselves against product liability claims, we could incur substantial liabilities. In addition, regardless of merit or eventual outcome, product liability claims may result in:

- decreased demand for our product candidates;
- impairment of our business reputation;
- withdrawal of clinical trial participants;
- costs of related litigation;
- distraction of management's attention from our primary business;
- substantial monetary awards to patients or other claimants;
- loss of revenues; and
- inability to commercialize our products.

We have obtained product liability insurance coverage for our clinical trials, but our insurance coverage may not be sufficient to reimburse us for any expenses or losses we may suffer. Moreover, insurance coverage is becoming increasingly expensive, and, in the future, we may not be able to maintain insurance coverage at a reasonable cost or in sufficient amounts to protect us against losses due to liability. On occasion, large judgments have been awarded in class action lawsuits based on products that had unanticipated side effects. A successful product liability claim or series of claims brought against us could cause our stock price to decline and, if judgments exceed our insurance coverage, could adversely affect our business.

Healthcare reform measures could hinder or prevent our products' commercial success.

In both the United States and certain foreign jurisdictions there have been, and we anticipate there will continue to be, a number of legislative and regulatory changes to the healthcare system that could impact our ability to sell any of our products profitably. In the United States, the federal government enacted healthcare reform legislation, the Patient Protection and Affordable Care Act, as amended by the Health Care and Education Reconciliation Act, or collectively, the ACA. Among the ACA's provisions of importance to the pharmaceutical industry are that it:

- imposed an annual excise tax of 2.3% on any entity that manufactures or imports medical devices offered for sale in the United States, with limited exceptions, although the effective rate paid may be lower. However, the 2020 federal spending package permanently eliminated, effective January 1, 2020, this ACA-mandated medical device tax;
- created an annual, nondeductible fee on any entity that manufactures or imports certain specified branded prescription drugs and biologic agents apportioned among these entities according to their market share in some government healthcare programs;
- increased the statutory minimum rebates a manufacturer must pay under the Medicaid Drug Rebate Program, to 23.1% and 13% of the average manufacturer price for most branded and generic drugs, respectively and capped the total rebate amount for innovator drugs at 100% of the Average Manufacturer Price, or AMP;
- created new methodology by which rebates owed by manufacturers under the Medicaid Drug Rebate Program are calculated for certain drugs and biologics that are inhaled, infused, instilled, implanted or injected;
- expanded eligibility criteria for Medicaid programs by, among other things, allowing states to offer Medicaid coverage to additional individuals and by adding new mandatory eligibility categories for individuals with income at or below 133% of the federal poverty level, thereby potentially increasing manufacturers' Medicaid rebate liability;
- expanded the entities eligible for discounts under the Public Health program;
- created a new Patient-Centered Outcomes Research Institute to oversee, identify priorities in, and conduct comparative clinical effectiveness research, along with funding for such research;
- established a Center for Medicare & Medicaid Innovation at the Centers for Medicare & Medicaid Services, or CMS, to test innovative payment and service delivery models to lower Medicare and Medicaid spending, potentially including prescription drug spending that began on January 1, 2011; and
- created a licensure framework for follow on biologic products.

There remain judicial and Congressional challenges to certain aspects of the ACA. While Congress has not passed comprehensive repeal legislation, it has enacted laws that modify certain provisions of the ACA such as removing penalties, starting January 1, 2019, for not complying with the ACA's individual mandate to carry qualifying health insurance coverage for all or part of a year. In addition, the 2020 federal spending package permanently eliminated, effective January 1, 2020, the ACA-mandated "Cadillac" tax on high-cost employer-sponsored health coverage, and, effective January 1, 2021, also eliminated the health insurer tax. On December 14, 2018, a Texas U.S. District Court Judge ruled that the ACA is unconstitutional in its entirety because the "individual mandate" was repealed by Congress as part of the Tax Cuts and Jobs Act of 2017. Additionally, on December 18, 2019, the U.S. Court of Appeals for the 5th Circuit upheld the District Court ruling that the individual mandate was unconstitutional and remanded the case back to the District Court to determine whether the remaining provisions of the ACA are invalid as well. The U.S. Supreme Court is currently reviewing the case, although it is unknown when a decision will be made. Further, although the U.S. Supreme Court has not yet ruled on the constitutionality of the ACA, on January 28, 2021, President Biden issued an executive order to initiate a special enrollment period from February 15, 2021 through May 15, 2021 for purposes of obtaining health insurance coverage through the ACA marketplace. The executive order also instructs certain governmental agencies to review and reconsider their existing policies and rules that limit access to healthcare, including among others, reexamining Medicaid demonstration projects and waiver programs that include work requirements, and policies that create unnecessary barriers to obtaining access to health insurance coverage through Medicaid or the ACA. It is unclear how the Supreme Court ruling, other such litigation, and the healthcare reform measures of the Biden administration will impact the ACA and our business.

In addition, other legislative changes have been proposed and adopted since the ACA was enacted. On August 2, 2011, the Budget Control Act of 2011 was signed into law, which, among other things, included reductions to Medicare payments to providers of 2% per fiscal year, which went into effect on April 1, 2013 and, due to subsequent legislative amendments to the statute will remain in effect through 2030 with the exception of a temporary suspension from May 1, 2020 through March 31, 2021 unless additional Congressional action is taken. On January 2, 2013, the American Taxpayer Relief Act of 2012 was signed into law, which, among other things, reduced Medicare payments to several providers, including hospitals, and increased the statute of limitations period for the government to recover overpayments to providers from three to five years.

Further there has been heightened governmental scrutiny in the United States of pharmaceutical pricing practices in light of the rising cost of prescription drugs and biologics. Such scrutiny has resulted in several recent congressional inquiries and proposed and enacted federal and state legislation designed to, among other things, bring more transparency to product pricing, review the relationship between pricing and manufacturer patient programs, and reform government program reimbursement

methodologies for products. At the federal level, the Trump administration used several means to propose or implement drug pricing reform, including through federal budget proposals, executive orders and policy initiatives. The Department of Health and Human Services, or HHS, has solicited feedback on some of these measures and implemented others under its existing authority. For example, on July 24, 2020 and September 13, 2020, the Trump administration announced several executive orders related to prescription drug pricing that seek to implement several of the administration's proposals. As a result, the FDA released a final rule on September 24, 2020, effective November 30, 2020, providing guidance for states to build and submit importation plans for drugs from Canada. Further, on November 20, 2020, HHS finalized a regulation removing safe harbor protection for price reductions from pharmaceutical manufacturers to plan sponsors under Part D, either directly or through pharmacy benefit managers, unless the price reduction is required by law. The implementation of the rule has been delayed by the Biden administration from January 1, 2022 to January 1, 2023 in response to ongoing litigation. The rule also creates a new safe harbor for price reductions reflected at the point-of-sale, as well as a new safe harbor for certain fixed fee arrangements between pharmacy benefit managers and manufacturers, the implementation of which have also been delayed pending review by the Biden administration until March 22, 2021. On November 20, 2020, CMS issued an interim final rule implementing the Trump administration's Most Favored Nation executive order, which would tie Medicare Part B payments for certain physician-administered drugs to the lowest price paid in other economically advanced countries, effective January 1, 2021. On December 28, 2020, the United States District Court in Northern California issued a nationwide preliminary injunction against implementation of the interim final rule. It is unclear whether the Biden administration will work to reverse these measures or pursue similar policy initiatives. Further, at the state level, legislatures have increasingly passed legislation and implemented regulations designed to control pharmaceutical and biological product pricing, including price or patient reimbursement constraints, discounts, restrictions on certain product access and marketing cost disclosure and transparency measures, and, in some cases, designed to encourage importation from other countries and bulk purchasing. It is also possible that additional governmental action is taken in response to the COVID-19 pandemic.

The continuing efforts of the government, insurance companies, managed care organizations and other payors of healthcare services to make and implement healthcare reforms may adversely affect:

- our ability to set a price we believe is fair for our products;
- our ability to generate revenues and achieve or maintain profitability;
- the availability of capital; and
- our ability to obtain timely approval of our products.

If we fail to comply with applicable healthcare regulations, we could face substantial penalties and our business, operations and financial condition could be adversely affected.

Certain federal, state, local and foreign healthcare laws and regulations pertaining to fraud and abuse, transparency, patients' rights, and privacy are applicable to our business. The laws that may affect our ability to operate include:

- the federal healthcare program Anti-Kickback Statute, which prohibits, among other things, people from soliciting, receiving or providing remuneration, directly or indirectly, to induce or reward either the referral of an individual, or ordering, or leasing of an item, good, facility or service, for which payment may be made by a federal healthcare program such as Medicare or Medicaid. The intent standard under the federal healthcare program Anti-Kickback Statute was amended by the ACA to a stricter standard such that a person or entity does not need to have actual knowledge of the statute or specific intent to violate it in order to have committed a violation. Further, the ACA codified case law that a claim including items or services resulting from a violation of the federal healthcare program Anti-Kickback Statute constitutes a false or fraudulent claim for purposes of the civil False Claims Act;
- federal civil and criminal false claims laws, including the civil False Claims Act, which prohibit, among other things, individuals or entities from knowingly presenting, or causing to be presented, claims for payment from Medicare, Medicaid, or other third-party payors that are false or fraudulent;
- the federal Health Insurance Portability and Accountability Act of 1996, or HIPAA, which prohibits, among other things, executing a scheme to defraud any healthcare benefit program or making false statements relating to healthcare matters. Similar to the federal healthcare program Anti-Kickback Statute, a person or entity does not need to have actual knowledge of the statute or specific intent to violate it in order to have committed a violation;
- HIPAA, as amended by the Health Information Technology for Economic and Clinical Health Act, and their implementing regulations, which imposes certain requirements relating to the privacy, security and transmission of individually identifiable health information on certain individuals and entities;
- the Physician Payments Sunshine Act, created under the ACA, which requires certain manufacturers of drugs, devices, biologics and medical supplies for which payment is available under Medicare, Medicaid or the Children's Health Insurance Program, with certain exceptions, to report annually to the Centers for Medicare & Medicaid Services, or CMS, information related to payments or other transfers of value made to physicians (defined to include doctors, dentists, optometrists, podiatrists, and chiropractors) and teaching hospitals, as well as ownership and investment

interests held by physicians and their immediate family members, and which, beginning in 2022, will require applicable manufacturers to report information regarding payments and other transfers of value provided during the previous year to physician assistants, nurse practitioners, clinical nurse specialists, certified nurse anesthetists, anesthesiologist assistants, and certified nurse-midwives;

- the Federal Food, Drug, and Cosmetic Act, which among other things, strictly regulates drug product marketing, prohibits manufacturers from marketing drug products for off-label use and regulates the distribution of drug samples;
- the U.S. Foreign Corrupt Practices Act, which, among other things, prohibits companies issuing stock in the U.S. from bribing foreign officials for government contracts and other business;
- state law equivalents of each of the above federal laws, such as anti-kickback and false claims laws which may apply to items or services reimbursed by any third-party payor, including commercial insurers, state and local laws requiring the registration of pharmaceutical sales and medical representatives, and state laws governing the privacy and security of health information in certain circumstances, many of which differ from each other in significant ways and often are not preempted by HIPAA, thus complicating compliance efforts; and
- additional state and local laws such as laws in California and Massachusetts, which mandate implementation of compliance programs, compliance with industry ethics codes, and spending limits, and other state and local laws, such as laws in Vermont, Maine, and Minnesota which require reporting to state governments of gifts, compensation, and other remuneration to physicians.

The shifting regulatory environment, along with the requirement to comply with multiple jurisdictions with different compliance and/or reporting requirements, increases the possibility that a company may run afoul of one or more laws.

We will be required to spend substantial time and money to ensure that our business arrangements with third parties comply with applicable healthcare laws and regulations. Because of the breadth of these laws and the narrowness of the statutory exceptions and regulatory safe harbors available, which require strict compliance in order to offer protection, it is possible that governmental authorities may conclude that our business practices do not comply with current or future statutes, regulations, agency guidance or case law involving applicable healthcare laws. If our operations are found to be in violation of any of the laws described above or any other governmental regulations that apply to us, we may be subject to significant penalties, including administrative, civil and criminal penalties, damages, fines, disgorgement, possible exclusion from participation in Medicare, Medicaid and other federal healthcare programs, imprisonment, integrity and/or other oversight obligations, contractual damages, reputational harm, and the curtailment or restructuring of our operations. Any such penalties could adversely affect our ability to operate our business and our financial results. Any action against us for violation of these laws, even if we successfully defend against it, could cause us to incur significant legal expenses and divert our management's attention from the operation of our business.

Our business involves the use of hazardous materials and we and our third-party manufacturers must comply with environmental laws and regulations, which can be expensive and restrict how we do business.

Our and our third-party manufacturers' activities involve the controlled storage, use and disposal of hazardous materials, including the components of our product candidates and other hazardous compounds. We and our manufacturers are subject to federal, state and local laws and regulations governing the use, manufacture, storage, handling and disposal of these hazardous materials. In the event of an accident, state or federal authorities may curtail the use of these materials and interrupt our business operations. If we are subject to any liability as a result of our or our third-party manufacturers' activities involving hazardous materials, our business and financial condition may be adversely affected.

We have entered into collaborations with Chinese companies and conduct certain research and development activities in China. Uncertainties regarding the interpretation and enforcement of Chinese laws, rules and regulations, a trade war or political unrest in China could materially adversely affect our business, financial condition and results of operations.

We conduct research and development activities in China through our collaboration with Advaccine, which is conducting and funding the Phase 2 trial of INO-4800 in China. In addition, we are party to a license and collaboration agreement with China-based company ApolloBio, pursuant to which ApolloBio has the exclusive right to develop and commercialize VGX-3100 in China, Hong Kong, Macao and Taiwan. The Chinese legal system is a civil law system based on written statutes. Unlike the common law system, prior court decisions may be cited for reference but have limited precedential value. In addition, the Chinese legal system is based in part on government policies and internal rules, some of which are not published on a timely basis or at all, and which may have a retroactive effect. As a result, we may not be aware of our violation of these policies and rules until after the occurrence of the violation. Any administrative and court proceedings in China may be protracted, resulting in substantial costs and diversion of resources and management attention. Since Chinese administrative and court authorities have significant discretion in interpreting and implementing statutory and contractual terms, it may be more difficult to evaluate the outcome of administrative and court proceedings and the level of legal protection we enjoy than in more developed legal systems. Furthermore, we are exposed to the possibility of disruption of our research and development activities in the event of changes in the policies of the United States or Chinese governments, political unrest or unstable

economic conditions in China. For example, a trade war could lead to increased costs for clinical materials that are manufactured in China. These interruptions or failures could also impede commercialization of our product candidates and impair our competitive position. Further, we may be exposed to fluctuations in the value of the local currency in China. These uncertainties may impede our ability to enforce the contracts we have entered into and our ability to continue our research and development activities and could materially and adversely affect our business, financial condition and results of operations.

Risks Related to Our Intellectual Property

It is difficult and costly to generate and protect our intellectual property and our proprietary technologies, and we may not be able to ensure their protection.

Our commercial success will depend in part on obtaining and maintaining patent, trademark, trade secret, and other intellectual property protection relating to our electroporation equipment and product candidates, as well as successfully defending these intellectual property rights against third-party challenges.

The patent positions of pharmaceutical and biotechnology companies can be highly uncertain and involve complex legal and factual questions for which important legal principles remain unresolved. The laws and regulations regarding the breadth of claims allowed in biotechnology patents have evolved over recent years and continues to undergo review and revision, both in the United States and abroad. The biotechnology patent situation outside the United States can be even more uncertain depending on the country. Changes in either the patent laws or in interpretations of patent laws in the United States and other countries may diminish the value of our intellectual property. Accordingly, we cannot predict the breadth of claims that may be allowed or enforced in our licensed patents, our patents or in third-party patents, nor can we predict the likelihood of our patents surviving a patent validity challenge.

The degree of future protection for our intellectual property rights is uncertain, because legal decision-making can be unpredictable, thereby often times resulting in limited protection, which may not adequately protect our rights or permit us to gain or keep our competitive advantage, or resulting in an invalid or unenforceable patent. For example:

- we, or the parties from whom we have acquired or licensed patent rights, may not have been the first to file the underlying patent applications or the first to make the inventions covered by such patents;
- the named inventors or co-inventors of patents or patent applications that we have licensed or acquired may be incorrect, which may give rise to inventorship and ownership challenges;
- others may develop similar or alternative technologies, or duplicate any of our products or technologies that may not be covered by our patents, including design-arounds;
- pending patent applications may not result in issued patents;
- the issued patents covering our products and technologies may not provide us with any competitive advantages or have any commercial value;
- the issued patents may be challenged and invalidated, or rendered unenforceable;
- the issued patents may be subject to reexamination, which could result in a narrowing of the scope of claims or cancellation of claims found unpatentable;
- we may not develop or acquire additional proprietary technologies that are patentable;
- our trademarks may be invalid or subject to a third party's prior use; or
- our ability to enforce our patent rights will depend on our ability to detect infringement, and litigation to enforce patent rights may not be pursued due to significant financial costs, diversion of resources, and unpredictability of a favorable result or ruling.

We depend, in part, on our licensors and collaborators to protect a portion of our intellectual property rights. In such cases, our licensors and collaborators may be primarily or wholly responsible for the maintenance of patents and prosecution of patent applications relating to important areas of our business. If any of these parties fail to adequately protect these products with issued patents, our business and prospects would be harmed significantly.

We also may rely on trade secrets to protect our technology, especially where we do not believe patent protection is appropriate or obtainable. However, trade secrets are difficult to protect. Although we use reasonable efforts to protect our trade secrets, our employees, consultants, contractors, outside scientific collaborators and other advisors may unintentionally or willfully disclose our trade secrets to competitors. Enforcing a claim that a third-party entity illegally obtained and is using any of our trade secrets is expensive and time consuming, and the outcome is unpredictable. In addition, courts outside the United States are sometimes less willing to protect trade secrets. Moreover, our competitors may independently develop equivalent knowledge, methods and know-how.

If we or our licensors fail to obtain or maintain patent protection or trade secret protection for our product candidates or our technologies, third parties could use our proprietary information, which could impair our ability to compete in the market and adversely affect our ability to generate revenues and attain profitability.

From time to time, U.S. and other policymakers have proposed reforming the patent laws and regulations of their countries. In September 2011 the America Invents Act (the Act) was signed into law. The Act changed the current "first-to-invent" system to a system that awards a patent to the "first-inventor-to-file" for an application for a patentable invention. The Act also created a procedure to challenge newly issued patents in the patent office via post-grant proceedings and new inter parties reexamination proceedings. These changes may make it easier for competitors to challenge our patents, which could result in increased competition and have a material adverse effect on our product sales, business and results of operations. The changes may also make it harder to challenge third-party patents and place greater importance on being the first inventor to file a patent application on an invention.

If we are sued for infringing intellectual property rights of third parties, it will be costly and time-consuming, and an unfavorable outcome in that litigation would have a material adverse effect on our business.

Other companies may have or may acquire intellectual property rights that could be enforced against us. If they do so, we may be required to alter our technologies, pay licensing fees or cease activities. If our products or technologies infringe the intellectual property rights of others, they could bring legal action against us or our licensors or collaborators claiming damages and seeking to enjoin any activities that they believe infringe their intellectual property rights.

Because patent applications can take many years to issue, and there is a period when the application remains undisclosed to the public, there may be currently pending applications unknown to us or reissue applications that may later result in issued patents upon which our products or technologies may infringe. There could also be existing patents of which we are unaware that our products or technologies may infringe. In addition, if third parties file patent applications or obtain patents claiming products or technologies also claimed by us in pending applications or issued patents, we may have to participate in interference or derivation proceedings in the United States Patent and Trademark Office to determine priority or derivation of the invention. If third parties file oppositions in foreign countries, we may also have to participate in opposition proceedings in foreign tribunals to defend the patentability of our filed foreign patent applications.

If a third party claims that we infringe its intellectual property rights, it could cause our business to suffer in a number of ways, including:

- we may become involved in time-consuming and expensive litigation, even if the claim is without merit, the third party's patent is invalid or we have not infringed;
- we may become liable for substantial damages for past infringement if a court decides that our technologies infringe upon a third party's patent;
- we may be enjoined by a court to stop making, selling or licensing our products or technologies without a license from a patent holder, which may not be available on commercially acceptable terms, if at all, or which may require us to pay substantial royalties or grant cross-licenses to our patents; and
- we may have to redesign our products so that they do not infringe upon others' patent rights, which may not be possible or could require substantial investment or time.

If any of these events occur, our business could suffer and the market price of our common stock may decline.

Risks Related to an Investment in Our Common Stock

An active trading market for our common stock may not be sustained.

Although our common stock is listed on the Nasdaq Global Select Market, we cannot assure you that an active trading market for our shares will continue to be sustained. If an active market for our common stock is not sustained, it may be difficult for investors in our common stock to sell shares without depressing the market price for the shares or to sell the shares at all.

The price of our common stock has been and may continue to be volatile, and an investment in our common stock could decline substantially in value.

In light of our small size and limited resources, as well as the uncertainties and risks that can affect our business and industry, our stock price has been and may continue to be highly volatile and has been and may in the future be subject to substantial drops, with or even in the absence of news affecting our business. Period to period comparisons are not indicative of future performance. The following factors, in addition to the other risk factors described in this report, and the potentially low volume of trades in our common stock, may have a significant impact on the market price of our common stock, some of which are beyond our control:

- developments concerning any research and development, clinical trials, manufacturing, and marketing efforts or collaborations, particularly developments concerning the prospects of INO-4800 as a potential vaccine candidate against COVID-19;
- fluctuating public or scientific interest in the potential for COVID-19 and other pandemic or other applications for our vaccine or other product candidates;

- our announcement of significant acquisitions, strategic collaborations, joint ventures or capital commitments;
- fluctuations in our operating results;
- announcements of technological innovations;
- new products or services that we or our competitors offer;
- changes in the structure of healthcare payment systems;
- the initiation, conduct and/or outcome of intellectual property and/or litigation matters;
- changes in financial or other estimates by securities analysts or other reviewers or evaluators of our business;
- conditions or trends in bio-pharmaceutical or other healthcare industries;
- regulatory developments in the United States and other countries;
- negative perception of gene-based therapy;
- changes in the economic performance and/or market valuations of other biotechnology and medical device companies;
- additions or departures of key personnel;
- sales or other transactions involving our common stock;
- changes in our capital structure;
- sales or other transactions by executive officers or directors involving our common stock;
- changes in accounting principles;
- global unrest, terrorist activities, and economic and other external factors; and
- catastrophic weather and/or global disease pandemics, including COVID-19.

The stock market in general has recently experienced relatively large price and volume fluctuations, particularly in response to the COVID-19 outbreak. In particular, the market prices of securities of smaller biotechnology and medical device companies have experienced dramatic fluctuations that often have been unrelated or disproportionate to the operating results of these companies. Continued market fluctuations could result in extreme volatility in the price of our common stock, which could cause a decline in the value of our common stock. In addition, price volatility may increase if the trading volume of our common stock remains limited or declines.

Anti-takeover provisions under our charter documents and Delaware law could delay or prevent a change of control which could limit the market price of our common stock.

Our amended and restated certificate of incorporation contains provisions that could delay or prevent a change of control of our company or changes in our board of directors that our stockholders might consider favorable. Some of these provisions include:

- the authority of our board of directors to issue shares of undesignated preferred stock and to determine the rights, preferences and privileges of these shares, without stockholder approval;
- all stockholder actions must be effected at a duly called meeting of stockholders and not by written consent; and
- the elimination of cumulative voting.

In addition, we are governed by the provisions of Section 203 of the Delaware General Corporate Law, which may prohibit certain business combinations with stockholders owning 15% or more of our outstanding voting stock. These and other provisions in our amended and restated certificate of incorporation, amended and restated bylaws and Delaware law could make it more difficult for stockholders or potential acquirers to obtain control of our board of directors or initiate actions that are opposed by the then-current board of directors, including to delay or impede a merger, tender offer or proxy contest involving our company. Any delay or prevention of a change of control transaction or changes in our board of directors could cause the market price of our common stock to decline.

We have never paid cash dividends on our common stock and we do not anticipate paying dividends in the foreseeable future.

We have paid no cash dividends on our common stock to date, and we currently intend to retain our future earnings, if any, to fund the development and growth of our business. In addition, the terms of any future debt or credit facility may preclude or limit our ability to pay any dividends. As a result, capital appreciation, if any, of our common stock will be the sole source of potential gain for the foreseeable future.

General Risk Factors

Our quarterly operating results may fluctuate significantly.

We expect our operating results to be subject to quarterly fluctuations. Our net loss and other operating results will be affected by numerous factors, including:

- variations in the level of expenses related to our electroporation equipment, product candidates or future development programs;
- expenses related to corporate transactions, including ones not fully completed;
- addition or termination of clinical trials or funding support;
- any intellectual property infringement lawsuit in which we may become involved;
- any legal claims that may be asserted against us or any of our officers;
- regulatory developments affecting our electroporation equipment and product candidates or those of our competitors;
- debt service obligations on the Notes and the December 2019 Bonds;
- changes in the fair value of our investments, including investments in affiliated entities;
- our execution of any collaborative, licensing or similar arrangements, and the timing of payments we may make or receive under these arrangements; and
- if any of our products receives regulatory approval, the levels of underlying demand for our products.

If our quarterly operating results fall below the expectations of investors or securities analysts, the price of our common stock could decline substantially. Furthermore, any quarterly fluctuations in our operating results may, in turn, cause the price of our stock to fluctuate substantially. We believe that quarterly comparisons of our financial results are not necessarily meaningful and should not be relied upon as an indication of our future performance.

Our results of operations and liquidity needs could be materially affected by market fluctuations and general economic conditions.

Our results of operations could be materially affected by economic conditions generally, both in the United States and elsewhere around the world. Concerns over inflation, energy costs, geopolitical issues, global pathogen outbreaks or pandemics, including COVID-19, and the availability and cost of credit have in the past and may continue to contribute to increased volatility and diminished expectations for the economy and the markets going forward. Market upheavals may have an adverse effect on us. In the event of a market downturn, our results of operations could be adversely affected. Our future cost of equity or debt capital and access to the capital markets could be adversely affected, and our stock price could decline. There may be disruption in or delay in the performance of our third-party contractors and suppliers. If our contractors, suppliers and partners are unable to satisfy their contractual commitments, our business could suffer. In addition, we maintain significant amounts of cash and cash equivalents at one or more financial institutions that are in excess of federally insured limits, and we may experience losses on these deposits.

If equity research analysts do not publish research or reports, or publish unfavorable research or reports, about us, our business or our market, our stock price and trading volume could decline.

The trading market for our common stock is influenced by the research and reports that equity research analysts publish about us and our business, and we have limited research coverage by equity research analysts. Equity research analysts may elect not to initiate or continue to provide research coverage of our common stock, and such lack of research coverage may adversely affect the market price of our common stock. Even if we have equity research analyst coverage, we will not have any control over the analysts or the content and opinions included in their reports. The price of our stock could decline if one or more equity research analysts downgrade our stock or issue other unfavorable commentary or research. If one or more equity research analysts ceases coverage of our company or fails to publish reports on us regularly, demand for our stock could decrease, which in turn could cause our stock price or trading volume to decline.

The issuance of additional stock in connection with financings, acquisitions, investments, our stock incentive plans or otherwise will dilute all other stockholders.

Our certificate of incorporation authorizes us to issue up to 600,000,000 shares of common stock and up to 10,000,000 shares of preferred stock with such rights and preferences as may be determined by our board of directors. Subject to compliance with applicable rules and regulations, we may issue our shares of common stock or securities convertible into our common stock from time to time in connection with a financing, acquisition, investment, our stock incentive plans or otherwise. Any such issuance could result in substantial dilution to our existing stockholders and cause the trading price of our common stock to decline.

We incur significant costs and demands upon management as a result of being a public company.

As a public company listed in the United States, we incur significant legal, accounting and other costs that could negatively affect our financial results. In addition, changing laws, regulations and standards relating to corporate governance and public disclosure, including regulations implemented by the SEC and stock exchanges, may increase legal and financial compliance costs and make some activities more time-consuming. These laws, regulations and standards are subject to varying interpretations and, as a result, their application in practice may evolve over time as new guidance is provided by regulatory and governing bodies. We intend to invest resources to comply with evolving laws, regulations and standards, and this investment

may result in increased general and administrative expenses and a diversion of management's time and attention from revenue-generating activities to compliance activities. If notwithstanding our efforts to comply with new laws, regulations and standards, we fail to comply, regulatory authorities may initiate legal proceedings against us and our business may be harmed.

Failure to comply with these rules might also make it more difficult for us to obtain some types of insurance, including director and officer liability insurance, and we might be forced to accept reduced policy limits and coverage or incur substantially higher costs to obtain the same or similar coverage. The impact of these events could also make it more difficult for us to attract and retain qualified persons to serve on our board of directors, on committees of our board of directors or as members of senior management.

Changes in tax laws could adversely affect our business and financial condition.

In December 2017, the Tax Cuts and Jobs Act of 2017 was enacted, which significantly revised the Internal Revenue Code of 1986, as amended, or the Code. The new federal income tax law, among other things, contains significant changes to corporate taxation, including reduction of the corporate tax rate from a top marginal rate of 35 percent to a flat rate of 21 percent, limitation of the tax deduction for interest expense to 30 percent of adjusted earnings (except for certain small businesses), limitation of the deduction for net operating losses to 80 percent of current-year taxable income and elimination of net operating loss carrybacks, one time taxation of offshore earnings at reduced rates regardless of whether they are repatriated, immediate deductions for certain new investments instead of deductions for depreciation expense over time, and modifying or repealing many business deductions and credits (including reducing the business tax credit for certain clinical testing expenses incurred in the testing of certain drugs for rare diseases or conditions). Notwithstanding the reduction in the corporate income tax rate, the overall impact of the federal tax law is uncertain and our business and financial condition could be adversely affected. In addition, it is uncertain if and to what extent various states will conform to the federal tax law.

ITEM 1B. UNRESOLVED STAFF COMMENTS

None.

ITEM 2. PROPERTIES

We own no real property and have no plans to acquire any real property in the future.

San Diego Leases

In April 2013, we entered into a lease, or the First San Diego Lease, for office space in San Diego, California. The term of the First San Diego Lease commenced on December 1, 2013. The initial term of the First San Diego Lease is ten years, with an option to extend the term by five years, subject to specified conditions. In June 2015, we amended the First San Diego Lease to increase the total leased space to 31,207 square feet and occupy the entire building. The commencement of the amended First San Diego Lease was in January 2016. As of December 31, 2020, rent payments under the First San Diego Lease include base rent with an annual increase of approximately 3 percent, and additional monthly fees to cover our share of certain facility expenses, including utilities, property taxes, insurance and maintenance. We had an option to terminate the First San Diego Lease on December 1, 2019, which we did not exercise.

In October 2016, we entered into an office lease, or the Second San Diego Lease, for a second property in San Diego, California. The total space under the Second San Diego Lease is approximately 51,000 square feet. We are using the facility for office, manufacturing and research and development purposes. The term of the Second San Diego Lease commenced on June 1, 2017. The initial term of the Second San Diego Lease is ten years, with a right to terminate on November 30, 2023, subject to specified conditions.

The base rent adjusts periodically throughout the term of the Second San Diego Lease. As of December 31, 2020, rent payments under the Second San Diego Lease include base rent with an annual increase of approximately 3 percent, and additional monthly fees to cover our share of certain facility expenses, including utilities, property taxes, insurance and maintenance. In addition, we have paid a security deposit of $95,000.

Plymouth Meeting Lease

In March 2014, we entered into a lease, or the Plymouth Meeting Lease, for our corporate headquarters in Plymouth Meeting, Pennsylvania. We occupied the space in June 2014. The initial term of the Plymouth Meeting Lease was 11.5 years, with a right to extend the term by five years, subject to specified conditions. We use the space for office purposes.

The base rent adjusts periodically throughout the term of the Plymouth Meeting Lease. As of December 31, 2020, rent payments under the Plymouth Meeting Lease include base rent with an annual increase of approximately 2 percent, and additional monthly fees to cover our share of certain facility expenses, including utilities, property taxes, insurance and maintenance. In addition, we have paid a security deposit of $49,000. In July 2015, we amended the Plymouth Meeting Lease to increase the total leased space to 27,583 square feet.

In June 2017, we entered into another amendment to the Plymouth Meeting Lease to increase the total leased space to 57,361 square feet and extend the lease term through December 31, 2029. In connection with this amendment, we paid the landlord an additional security deposit of $75,000.

In the fourth quarter of 2019, we entered into two agreements to sublease a total of approximately 13,500 square feet in our Plymouth Meeting headquarters through periods between December 31, 2022 and March 31, 2025.

We believe our current and future planned facilities will be adequate to meet our operating needs for the foreseeable future. Should we need additional space, we believe we will be able to secure additional space at commercially reasonable rates.

ITEM 3. LEGAL PROCEEDINGS

Securities Litigation

On March 12, 2020, a purported shareholder class action complaint, *McDermid v. Inovio Pharmaceuticals, Inc. and J. Joseph Kim*, was filed in the United States District Court for the Eastern District of Pennsylvania, naming us and J. Joseph Kim, our Chief Executive Officer, as defendants. The lawsuit alleges that we made materially false and misleading statements regarding our development of a vaccine for COVID-19 in our public disclosures in violation of certain federal securities laws. The plaintiff seeks unspecified monetary damages on behalf of the putative class and an award of costs and expenses, including reasonable attorneys' fees. On June 18, 2020, the court appointed Manuel Williams to serve as lead plaintiff. On August 3, 2020, Mr. Williams filed a consolidated complaint, naming us and three of our officers as defendants. On September 21, 2020, Mr. Williams and another purported stockholder, Andrew Zenoff filed a first amended complaint, naming us and three of our officers as defendants. Defendants filed a motion to dismiss plaintiff's first amended complaint on November 5, 2020. On February 16, 2021, the court issued an order granting in part, and denying in part, Defendants' motion to dismiss. The court granted Defendants' motion to dismiss, and dismissed with prejudice, the claims premised on the April 30 and June 30, 2020 statements. The court denied Defendants' motion to dismiss as to the remaining statements. Defendants' deadline to file their answer to the complaint is March 2, 2021.

On April 20, 2020, a purported shareholder derivative complaint, *Behesti v. Kim, et al.*, was filed in the United States District Court for the Eastern District of Pennsylvania, naming eight current and former directors as defendants. The lawsuit asserts state and federal claims and is based on the same alleged misstatements as the shareholder class action complaint. The lawsuit accuses our board of directors of failing to exercise reasonable and prudent supervision over our management, policies, practices, and internal controls. The plaintiff seeks unspecified monetary damages on behalf of us as well as governance reforms. On June 5, 2020, the court stayed the *Beheshti* action pending resolution of a forthcoming motion to dismiss the McDermid securities class action or until any party provides notice that they no longer consent to the stay.

On June 12 and June 15, 2020, two additional shareholder derivative complaints were filed in the United States District Court for the Eastern District of Pennsylvania, captioned *Isman v. Benito*, *et al.* and *Devarakonda et al. v Kim, et. al*. The complaints assert substantially similar claims as the *Beheshti* action and name our current directors as defendants. The *Devarakonda* complaint also names one of our former directors as a defendant. On July 21, 2020, the court consolidated the three derivative cases under the caption *In re Inovio Pharmaceuticals, Inc. Derivative Litigation*. The consolidated action is stayed pending resolution of a forthcoming motion to dismiss the *McDermid* securities class action or until any party provides notice that they no longer consent to the stay.

On July 7, 2020, a fourth shareholder derivative complaint, *Fettig v. Kim et al.*, was filed in the United States District Court for the Eastern District of Pennsylvania, naming eight current and former directors as defendants. The complaint asserts substantially similar claims as those in the consolidated derivative action. On August 27, 2020, the Fettig action was consolidated with the other derivative cases, which remain stayed as explained above.

We intend to defend these actions vigorously.

VGXI Litigation

On June 3, 2020, we filed a complaint in the Court of Common Pleas of Montgomery County, Pennsylvania against VGXI, Inc. and GeneOne Life Science, Inc., or GeneOne, and together with VGXI, Inc. collectively referred to as VGXI, alleging that VGXI had materially breached our supply agreement with them. The complaint seeks declaratory judgments, specific performance of the agreement, injunctive relief, an accounting, damages, attorneys' fees, interest, costs and other relief from VGXI. On June 3, 2020, we filed a petition for preliminary injunction, which was denied on June 25, 2020. On June 26, 2020, we filed notice of appeal of the denial of the petition with the Pennsylvania Superior Court.

On July 7, 2020, VGXI filed an answer, new matter and counterclaims against us, alleging that we had breached the supply agreement, as well as misappropriation of trade secrets and unjust enrichment. The counterclaims seek injunctive relief, damages, attorneys' fees, interest, costs and other relief from us. Also, on July 7, 2020, VGXI filed a third-party complaint against Ology Bioservices, Inc., a contract manufacturing organization that we had engaged to provide services similar to those

that were being provided by VGXI. On July 27, 2020, we filed an answer to VGXI's counterclaims, disputing the allegations and the claims raised in VGXI's filing. On October 1, 2020, we filed a notice of discontinuance of appeal with the Pennsylvania Superior Court. A trial date for the litigation has not been set.

We intend to aggressively prosecute the claims set forth in our complaint against VGXI and to vigorously defend ourselves against VGXI's counterclaims.

On December 7, 2020, GeneOne filed a complaint in the Court of Common Pleas of Montgomery County, Pennsylvania against us, alleging that we had breached the CELLECTRA Device License Agreement, or the Agreement, between us and GeneOne. We terminated the Agreement on October 9, 2020. The complaint asserts claims for breach of contract, declaratory judgment, unfair competition, and unjust enrichment. The complaint seeks injunctive relief, an accounting, damages, disgorgement of profits, attorneys' fees, interest, and other relief from us. We intend to vigorously defend ourselves against GeneOne's claims. On January 29, 2021, we filed preliminary objections to the complaint.

ITEM 4. MINE SAFETY DISCLOSURES

Not applicable.

PART II

ITEM 5. MARKET FOR REGISTRANT'S COMMON EQUITY, RELATED STOCKHOLDER MATTERS AND ISSUER PURCHASES OF EQUITY SECURITIES

Market Information

Our common stock, par value $0.001 per share, began trading on the Nasdaq Global Select Market on September 15, 2014 under the symbol "INO," having previously traded on the NYSE MKT exchange.

As of February 11, 2021, we had approximately 457 common stockholders of record. The actual number of stockholders is greater than this number of record holders and includes stockholders who are beneficial owners but whose shares are held in street name by brokers and other nominees. This number of holders of record also does not include stockholders whose shares may be held in trust by other entities.

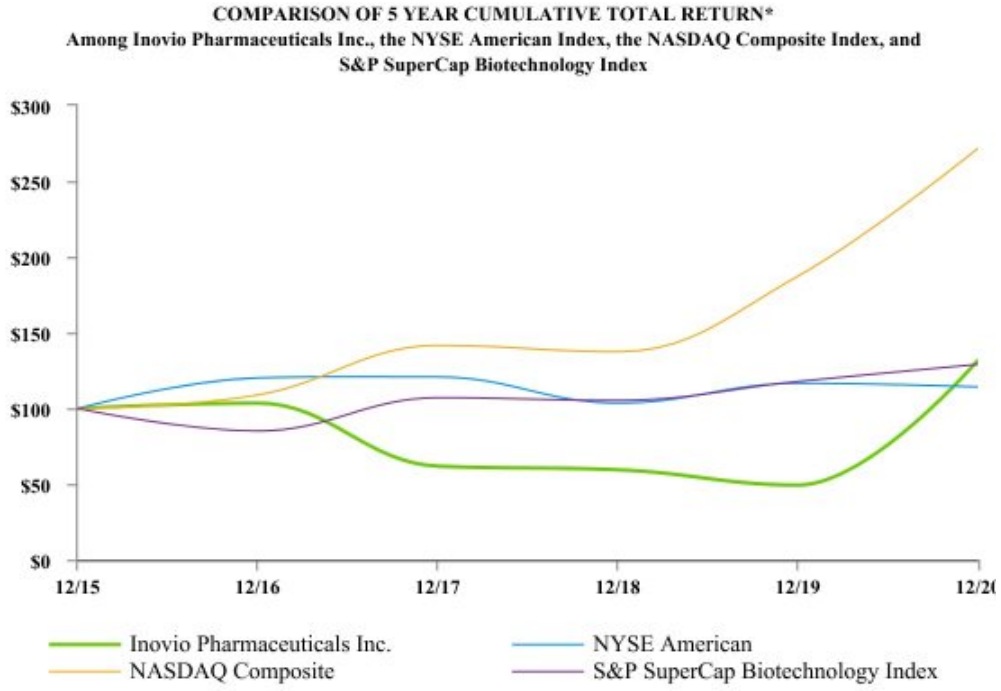
The closing price per share of our common stock on February 11, 2021 was $13.00, as reported on the Nasdaq Global Select Market.

Dividends

The payment of any dividends on our common stock is within the discretion of our board of directors. We have never paid cash dividends on our common stock and the board of directors does not expect to declare cash dividends on the common stock in the foreseeable future.

Performance Graph

The graph below compares the performance of our common stock with the performance of the NYSE American Index, the S&P SuperCap Biotechnology index and the Nasdaq Composite Index for the five years ended December 31, 2020. The graph assumes a $100 investment on December 31, 2015 in our common stock and in each index, with the reinvestment of all dividends, if any.



*$100 invested on 12/31/15 in stock or index, including reinvestment of dividends.
Fiscal year ended December 31.

	12/15	12/16	12/17	12/18	12/19	12/20
Inovio Pharmaceuticals, Inc.	100.00	103.27	61.46	59.52	49.11	131.70
NYSE American	100.00	119.65	120.83	103.00	116.58	113.81
Nasdaq Composite	100.00	108.87	141.13	137.12	187.44	271.64
S&P SuperCap Biotechnology Index	100.00	84.56	106.71	105.29	117.81	128.96

The stock price performance included in this graph is not necessarily indicative of future stock price performance. The performance graph is furnished solely to accompany this Form 10-K annual report and shall not be deemed to be incorporated by reference by means of any general statement incorporating by reference this Form 10-K into any filing under the Securities Act of 1933, as amended, or the Securities Exchange Act of 1934, as amended, except to the extent that we specifically incorporate such information by reference, and shall not otherwise be deemed filed under such acts.

Recent Sales of Unregistered Securities

During the year ended December 31, 2020, we issued 5,147 shares of common stock upon the conversion of preferred stock and a total of 16,498,024 shares of common stock upon the conversion of convertible debt instruments. The foregoing shares of common stock were issued in reliance upon the exemption set forth in Section 3(a)(9) of the Securities Act of 1933, as amended, for securities exchanged by us and existing security holders where no commission or other remuneration is paid or given directly or indirectly by us for soliciting such exchange.

Purchases of Equity Securities by the Issuer and Affiliated Parties

None.

ITEM 6. SELECTED FINANCIAL DATA

The following selected consolidated financial data should be read together with "Management's Discussion and Analysis of Financial Condition and Results of Operations" and our consolidated financial statements and related notes included elsewhere in this report. The selected consolidated balance sheet data at December 31, 2020 and 2019 and the selected consolidated statements of operations data for the years ended December 31, 2020, 2019 and 2018 have been derived from our audited consolidated financial statements that are included elsewhere in this report. The selected consolidated balance sheet data at December 31, 2018, 2017, and 2016 and the selected consolidated statements of operations data for the years ended December 31, 2017 and 2016 have been derived from our audited consolidated financial statements not included in this report. Historical results are not necessarily indicative of the results to be expected in the future.

	Year Ended December 31, 2020	Year Ended December 31, 2019	Year Ended December 31, 2018	Year Ended December 31, 2017	Year Ended December 31, 2016
Statement of Operations Data:					
Revenue under collaborative research and development arrangements, including from affiliated entity	$ 6,624,316	$ 3,872,594	$ 30,310,309	$ 29,173,216	$ 7,891,341
Grants and miscellaneous revenue, including from affiliated entities	786,904	239,336	171,588	13,046,870	27,477,020
Total revenues	7,411,220	4,111,930	30,481,897	42,220,086	35,368,361
Loss from operations	(124,082,044)	(111,108,545)	(94,091,138)	(83,642,901)	(76,235,937)
Other income (expense), net	(6,095,500)	(4,846,358)	920,891	1,612,974	1,257,257
Change in fair value of common stock warrants	—	—	360,795	806,819	127,554
Change in fair value of derivative liability	(75,670,977)	(1,763,652)	—	—	—
Gain (loss) on investment in affiliated entities	36,556,658	(3,090,557)	(1,988,567)	(6,982,664)	1,110,787
Net unrealized gain on available-for-sale equity securities	1,695,497	—	—	—	—
Gain on deconsolidation of Geneos	4,121,075	—	—	—	—
Loss on extinguishment of convertible bonds	(8,177,043)	—	—	—	—
Gain on extinguishment of convertible senior notes	8,762,030	—	—	—	—
Share in net loss of Geneos	(4,584,610)	—	—	—	—
(Provision for) benefit from income taxes	—	257,335	(2,169,811)	—	—
Net loss	(167,474,914)	(120,551,777)	(96,967,830)	(88,205,772)	(73,740,339)
Net loss attributable to non-controlling interest	1,063,757	1,192,558	—	—	—
Net loss attributable to Inovio Pharmaceuticals, Inc.	$ (166,411,157)	$ (119,359,219)	$ (96,967,830)	$ (88,205,772)	$ (73,740,339)
Net loss per common share attributable to common stockholders					
Basic	$ (1.07)	$ (1.21)	$ (1.05)	$ (1.08)	$ (1.01)
Diluted	$ (1.07)	$ (1.21)	$ (1.05)	$ (1.09)	$ (1.01)

	December 31, 2020	December 31, 2019	December 31, 2018	December 31, 2017	December 31, 2016
Balance Sheet Data:					
Cash and cash equivalents	$ 250,728,118	$ 22,196,097	$ 23,693,633	$ 23,786,579	$ 19,136,472
Short-term investments	160,914,935	67,338,017	57,538,852	103,638,844	85,629,412
Total assets	539,772,472	143,951,597	131,113,265	187,239,270	173,707,166
Current liabilities	41,705,954	31,989,321	35,299,759	35,405,426	43,823,027
Noncurrent liabilities	36,925,760	106,557,418	8,781,099	9,345,035	6,505,719
Accumulated deficit	(906,196,812)	(739,785,655)	(620,426,436)	(523,356,317)	(434,838,235)
Total stockholders' equity	461,140,758	5,404,858	87,032,407	142,488,809	123,378,420

ITEM 7. MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

This report contains forward-looking statements, as defined in Section 27A of the Securities Act of 1933, as amended, and Section 21E of the Securities Exchange Act of 1934, as amended. These statements relate to future events or our future financial performance. In some cases, you can identify forward-looking statements by terminology such as "may," "will," "should," "expect," "plan," "anticipate," "believe," "estimate," "predict," "potential" or "continue," the negative of such terms or other comparable terminology. These statements are only predictions. Actual events or results may differ materially.

Although we believe that the expectations reflected in the forward-looking statements are reasonable based on our current expectations and projections, we cannot guarantee future results, levels of activity, performance or achievements. Moreover, neither we, nor any other person, assume responsibility for the accuracy and completeness of the forward-looking statements. We are under no obligation to update any of the forward-looking statements after the filing of this Annual Report to conform such statements to actual results or to changes in our expectations.

The following discussion of our financial condition and results of operations should be read in conjunction with our consolidated financial statements and the related notes and other financial information appearing elsewhere in this Annual Report. Readers are also urged to carefully review and consider the various disclosures made by us which attempt to advise interested parties of the factors which affect our business, including without limitation the disclosures made in Item 1A of Part I of this Annual Report under the Caption "Risk Factors."

Risk factors that could cause actual results to differ from those contained in the forward-looking statements include but are not limited to: our history of losses; our lack of products that have received regulatory approval; uncertainties inherent in clinical trials and product development programs, including but not limited to the fact that pre-clinical and clinical results may not be indicative of results achievable in other trials or for other indications, that the studies or trials may not be successful or achieve desired results, that preclinical studies and clinical trials may not commence, have sufficient enrollment or be completed in the time periods anticipated, that results from one study may not necessarily be reflected or supported by the results of other similar studies, that results from an animal study may not be indicative of results achievable in human studies, that clinical testing is expensive and can take many years to complete, that the outcome of any clinical trial is uncertain and failure can occur at any time during the clinical trial process, and that our electroporation technology and DNA vaccines may fail to show the desired safety and efficacy traits in clinical trials; the availability of funding; the ability to manufacture vaccine candidates; 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; our ability to receive development, regulatory and commercialization event-based payments under our collaborative agreements; whether our proprietary rights are enforceable or defensible or infringe or allegedly infringe on rights of others or can withstand claims of invalidity; and the impact of government healthcare laws and proposals.

Overview

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 human papillomavirus (HPV). Our DNA medicines pipeline is comprised of three types of product candidates: DNA vaccines, DNA immunotherapies and DNA encoded monoclonal antibodies (dMAbs®). In clinical trials, we have demonstrated that DNA medicines can be delivered directly into cells in the body through our proprietary smart device to consistently activate robust and fully functional T cell and antibody responses against targeted pathogens and cancers.

Our novel DNA medicine candidates are made using our proprietary SynCon® technology that uses a computer algorithm designed to identify and optimize the DNA sequence of the target antigen (be it virus or a tumor). INOVIO then creates optimized plasmids, which are circular strands of DNA that instruct a cell to produce antigens to help the person's immune system recognize and destroy cancerous or virally infected cells.

Our patented CELLECTRA® smart delivery devices provide optimized uptake of our DNA medicines within the cell, overcoming a key limitation of other DNA-based technology approaches, namely cellular uptake.

Human clinical trial data to date has shown a favorable safety profile of our DNA medicines delivered directly into cells in the body using the CELLECTRA® smart device in more than 7,000 administrations across more than 3,000 patients.

Our corporate strategy is to advance, protect and, once approved, commercialize our novel DNA medicines to meet urgent and emerging global health needs. We continue to advance and clinically validate an array of DNA medicine candidates that target HPV-associated diseases, cancer, and infectious diseases, such as COVID-19 (SARS-CoV-2). We aim to advance these candidates through commercialization and continue to leverage third-party resources through collaborations and partnerships, including product license agreements.

Our partners and collaborators include ApolloBio Corp., AstraZeneca, Advaccine, The Bill & Melinda Gates Foundation (Gates), Coalition for Epidemic Preparedness Innovations (CEPI), Defense Advanced Research Projects Agency (DARPA), The U.S. Department of Defense (DoD), GeneOne Life Science, HIV Vaccines Trial Network, the U.S. Defense Threat Reduction Agency's Medical CBRN Defense Consortium (MCDC), International Vaccine Institute (IVI), National Cancer Institute, National Institutes of Health, National Institute of Allergy and Infectious Diseases, Ology Bioservices, the Parker Institute for Cancer Immunotherapy, Plumbline Life Sciences, Regeneron Pharmaceuticals, Richter-Helm BioLogics, Thermo Fisher Scientific, the University of Pennsylvania, the Walter Reed Army Institute of Research, and The Wistar Institute.

We or our collaborators are currently conducting or planning clinical studies of our DNA medicines for HPV-associated precancers, including cervical, vulvar, and anal dysplasia; HPV-associated cancers, including head & neck, cervical, anal, penile, vulvar, and vaginal; other HPV-associated disorders, such as recurrent respiratory papillomatosis, or RRP; glioblastoma multiforme, or GBM; prostate cancer; HIV; Ebola; Middle East Respiratory Syndrome, or MERS; Lassa fever; Zika virus; and the COVID-19 virus.

All of our product candidates are in the research and development phase. We have not generated any revenues from the sale of any products, and we do not expect to generate any such revenues for at least the next several years. We earn revenue from license fees and milestone revenue and collaborative research and development agreements. Our product candidates will require significant additional research and development efforts, including extensive preclinical and clinical testing. All product candidates that we advance to clinical testing will require regulatory approval prior to commercial use, and will require significant costs for commercialization. We may not be successful in our research and development efforts, and we may never generate sufficient product revenue to be profitable.

As of December 31, 2020, we had an accumulated deficit of $906.2 million. We expect to continue to incur substantial operating losses in the future due to our commitment to our research and development programs, the funding of preclinical studies, clinical trials and regulatory activities and the costs of general and administrative activities.

Impacts of COVID-19 on Our Business

The COVID-19 pandemic has had a number of significant impacts on our business during 2020. Most notably, in the United States, South Korea and China, we have accelerated the clinical development of INO-4800, our DNA vaccine candidate matched to the outbreak strain of SARS-CoV-2, the virus that causes COVID-19. In January, we received initial grant funding from CEPI to advance INO-4800 into preclinical studies and clinical development through Phase 1 human testing. We had previously been awarded grants from CEPI for the development of other DNA vaccines against Lassa fever and Middle East Respiratory Syndrome, MERS, which is also caused by a coronavirus like COVID-19. We commenced a Phase 1 clinical trial in the United States in April, and in June we reported positive interim data from the first two cohorts of the trial. In December 2020, we dosed the first subject in the Phase 2 segment of our Phase 2/3 clinical trial called INNOVATE (**IN**ovio **INO**-4800 **Va**ccine **T**rial for **E**fficacy). We have fully enrolled approximately 400 participants in the Phase 2 segment who are 18 years or older at 17 U.S. sites to evaluate safety and immunogenicity in order to confirm the dose(s) for the subsequent efficacy evaluation as part of the Phase 3 segment of the trial, once the FDA allows us to proceed. The Phase 3 segment of the INNOVATE remains on partial clinical hold until we satisfactorily resolve the FDA's remaining questions related to the CELLECTRA® 2000 device that will be used to deliver INO-4800 into the cells of the skin. We plan to satisfy the remaining device questions during the conduct of Phase 2 segment and prior to the start of the Phase 3 segment of INNOVATE. In the Phase 3 segment of the trial, we intend to enroll healthy men and non-pregnant women 18 years and older, to evaluate the efficacy of the proposed dosing level(s) for each age group 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.

We have also initiated clinical trials of INO-4800 in South Korea and China. In April, CEPI awarded us a grant of $6.9 million to work with International Vaccine Institute and the Korea National Institute of Health to conduct a Phase 1/2 trial, which was the first COVID-19 vaccine clinical trial approved in South Korea. In China, we are collaborating with Advaccine and have dosed 640 subjects with the first vaccination in a Phase 2 clinical trial in China. The Phase 2 clinical trial of INO-4800 in China has enrolled both adults who are 18-59 years old and older adults (60 years and older) with the primary endpoints of evaluating safety and immunogenicity within the Chinese population.

In parallel with our accelerated clinical development efforts, we have engaged a network of partners for the planned large-scale manufacturing of INO-4800 if it achieves regulatory approval. In March, the U.S. Department of Defense, or DoD, awarded Ology Bioservices Inc. a contract to manufacture INO-4800 for the DoD to be used in upcoming clinical trials. In April, we entered into an agreement with the German contract manufacturer Richter-Helm BioLogics GmbH & Co. KG and expanded our preexisting manufacturing partnership to support large-scale manufacturing of INO-4800. In March, we also received a grant from the Bill and Melinda Gates Foundation for accelerated testing and scale up of our CELLECTRA® 3PSP proprietary smart device for the intradermal delivery of INO-4800. In June, the DoD awarded us $71.1 million to support the large-scale manufacture of CELLECTRA® 3PSP, production of doses and the procurement of CELLECTRA® 2000 devices that

are used to deliver INO-4800 intradermally. In the second half of 2020, we added Thermo Fisher Scientific and Kaneka Eurogentec S.A., an affiliate of Kaneka Corporation, to our manufacturing consortium.

Operationally, we have not experienced significant disruptions to date as a result of the COVID-19 pandemic. In response to the outbreak, a number of governmental orders and other public health guidance measures were implemented across much of the United States, including in the locations of our offices, laboratories, clinical trial sites and third parties on whom we rely. We have implemented a work from home policy allowing employees who can work from home to do so, while those needing to work in laboratory facilities work in shifts to reduce the number of people gathered together at one time. Business travel has been suspended, and online and teleconference technology is used to meet virtually rather than in person. We have taken measures to secure our research and development project activities, while work in laboratories has been organized to reduce risk of COVID-19 transmission.

To date, our liquidity has also not been negatively impacted by the pandemic. During the year ended December 31, 2020, we raised $454.5 million in net proceeds from the sale of shares of our common stock through our "at-the-market" equity offering program, which further enhanced our liquidity and capital resources. As of December 31, 2020, our cash and cash equivalents and short-term investments were $411.6 million, compared to $89.5 million as of December 31, 2019. In addition, in January 2021, we closed an underwritten public offering with net proceeds to us of $162.1 million.

We are closely monitoring the impact of the COVID-19 pandemic on our employees, collaborators and service providers. The extent to which the pandemic will impact our business and operations will depend on future developments, including the duration of the outbreak, travel restrictions and social distancing in the United States and other countries, and the effectiveness of actions taken in the United States and other countries to contain and treat the disease, including mass vaccination efforts, that are highly uncertain. For additional information on the potential effects of the COVID-19 pandemic on our business, financial condition and results of operations, see the “Risk Factors” section above in Part I, Item 1A of this Form 10-K.

Critical Accounting Policies

The SEC defines critical accounting policies as those that are, in management’s view, important to the portrayal of our financial condition and results of operations and require management’s judgment. Our discussion and analysis of our financial condition and results of operations are based on our audited consolidated financial statements, which have been prepared in accordance with U.S. GAAP. The preparation of these financial statements requires us to make estimates and judgments that affect the reported amounts of assets, liabilities, revenue and expenses. We base our estimates on experience and on various assumptions that we believe are reasonable under the circumstances, the results of which form the basis for making judgments about the carrying values of assets and liabilities that are not readily apparent from other sources. Actual results may differ from those estimates. Our critical accounting policies include:

Collaboration Agreements

We assess whether our collaboration agreements are subject to Accounting Standards Codification ("ASC") Topic 808: Collaborative Arrangements (“Topic 808”) based on whether they involve joint operating activities and whether both parties have active participation in the arrangement and are exposed to significant risks and rewards. To the extent that the arrangement falls within the scope of Topic 808, we assesses whether the payments between us and the collaboration partner are subject to other accounting literature. If payments from the collaboration partner to us represent consideration from a customer, then we account for those payments within the scope of Accounting Standards Update (“ASU”) 2014-09, *Revenue from Contracts with Customers* (“Topic 606”). However, if we concludes that our collaboration partner is not a customer for certain activities, such as for certain collaborative research and development activities, we present such payments as a reduction of research and development expense.

Revenue Recognition

We recognize revenue when we transfer promised goods or services to customers in an amount that reflects the consideration to which we expect to be entitled in exchange for those goods or services. To determine revenue recognition for contracts with customers, we perform the following five steps: (i) identify the contract(s) with a customer; (ii) identify the performance obligations in the contract; (iii) determine the transaction price; (iv) allocate the transaction price to the performance obligations in the contract; and (v) recognize revenue when (or as) we satisfy our performance obligations. At contract inception, we assess the goods or services agreed upon within each contract and assess whether each good or service is distinct and determine those that are performance obligations. We then recognize as revenue the amount of the transaction price that is allocated to the respective performance obligation when (or as) the performance obligation is satisfied.

Collaborative Arrangements

We enter into collaborative arrangements with partners that typically include payment of one or more of the following: (i) license fees; (ii) product supply services; (iii) milestone payments related to the achievement of developmental, regulatory, or commercial goals; and (iv) royalties on net sales of licensed products. Where a portion of non-refundable, upfront fees or other payments received are allocated to continuing performance obligations under the terms of a collaborative arrangement, they are recorded as deferred revenue and recognized as revenue when (or as) the underlying performance obligation is satisfied.

As part of the accounting for these arrangements, we must develop estimates and assumptions that require judgment of management to determine the underlying stand-alone selling price for each performance obligation which determines how the transaction price is allocated among the performance obligation. The standalone selling price may include items such as forecasted revenues, development timelines, discount rates and probabilities of technical and regulatory success. We evaluate each performance obligation to determine if it can be satisfied at a point in time or over time. In addition, variable consideration must be evaluated to determine if it is constrained and, therefore, excluded from the transaction price.

License Fees

If a license to intellectual property is determined to be distinct from the other performance obligations identified in the arrangement, we recognize revenues from non-refundable, upfront fees allocated to the license when the license is transferred to the licensee and the licensee is able to use and benefit from the license. For licenses that are bundled with other promises, we utilize judgment to assess the nature of the combined performance obligation to determine whether the combined performance obligation is satisfied over time or at a point in time and, if over time, the appropriate method of measuring progress for purposes of recognizing revenue. We evaluate the measure of progress each reporting period and, if necessary, adjust the measure of performance and related revenue recognition.

Product Supply Services

Arrangements that include a promise for future supply of drug product for either clinical development or commercial supply at the licensee's discretion are generally considered as options. We assess if these options provide a material right to the licensee and if so, they are accounted for as separate performance obligations. We evaluate whether we are the principal or agent in the arrangement. We have determined that we are the principal in current arrangements as we control the product supply before it is transferred to the customer.

Milestone Payments

At the inception of each arrangement that includes milestone payments (variable consideration), we evaluate whether the milestones are considered probable of being reached and estimate the amount to be included in the transaction price using the most likely amount method. If it is probable that a significant revenue reversal would not occur, the associated milestone value is included in the transaction price. Milestone payments that are not within our or our collaboration partner's control, such as regulatory approvals, are generally not considered probable of being achieved until those approvals are received. The transaction price is then allocated to each performance obligation on a relative stand-alone selling price basis, for which we recognize revenue as or when the performance obligations under the contract are satisfied. At the end of each subsequent reporting period, we re-evaluate the probability of achieving such milestones and any related constraint, and if necessary, adjust our estimate of the overall transaction price. Any such adjustments are recorded on a cumulative catch-up basis, which would affect license, collaboration or other revenues and earnings in the period of adjustment.

Royalties

For arrangements that include sales-based royalties, including milestone payments based on the level of sales, and for which the license is deemed to be the predominant item to which the royalties relate, we recognize revenue at the later of (i) when the related sales occur, or (ii) when the performance obligation to which some or all of the royalty has been allocated has been satisfied (or partially satisfied). To date, we have not recognized any royalty revenue resulting from any of our collaborative arrangements.

Grants

We account for various grant agreements under the contributions guidance under Subtopic 958-605, *Not-for-Profit Entities-Revenue Recognition*, which is outside the scope of Topic 606, as the government agencies granting us funds are not receiving reciprocal value for their contributions. All contributions received from current grant agreements are recorded as a contra-expense as opposed to revenue on the consolidated statement of operations.

Leases

For our long-term operating leases, we recognized an operating lease right-of-use asset and an operating lease liability on our consolidated balance sheets. The lease liability is determined as the present value of future lease payments using an estimated rate of interest that we would pay to borrow equivalent funds on a collateralized basis at the lease commencement

date. The right-of-use asset is based on the liability adjusted for any prepaid or deferred rent. We determined the lease term at the commencement date by considering whether renewal options and termination options are reasonably assured of exercise.

Fixed rent expense for our operating leases is recognized on a straight-line basis over the term of the lease and is included in operating expenses on the consolidated statements of operations. Variable lease payments including lease operating expenses are recorded as incurred.

Derivative Liabilities

We evaluate our debt and equity issuances to determine if those contracts or embedded components of those contracts qualify as derivatives requiring separate recognition in our financial statements. The result of this accounting treatment is that the fair value of the embedded derivative is revalued at each balance sheet date and recorded as a liability, and the change in fair value during the reporting period is recorded in other income (expense) in the consolidated statements of operations. In circumstances where the embedded conversion option in a convertible instrument is required to be bifurcated and there are also other embedded derivative instruments in the convertible instrument that are required to be bifurcated, the bifurcated derivative instruments are accounted for as a single, compound derivative instrument. The classification of derivative instruments, including whether such instruments should be recorded as liabilities or as equity, is reassessed at the end of each reporting period. Derivative instrument liabilities are classified in the balance sheet as current or non-current based on whether or not net-cash settlement of the derivative instrument is expected within twelve months of the balance sheet date.

Research and Development Expenses

Our activities have largely consisted of research and development efforts related to developing electroporation delivery technologies and DNA immunotherapies and vaccines. Research and development expenses consist of expenses incurred in performing research and development activities including salaries and benefits, facilities and other overhead expenses, clinical trials, contract services and other outside expenses. Research and development expenses are charged to operations as they are incurred. These expenses result from our independent research and development efforts as well as efforts associated with collaborations and licensing arrangements. We review and accrue clinical trial expense based on work performed, relying on estimates of total trial management costs, sites activated, patients enrolled, and number of patient visits. We follow this method since reasonably dependable estimates of the costs applicable to various stages of a research agreement or clinical trial can be made. Accrued clinical trial costs are subject to revisions as trials progress. Revisions are charged to expense in the period in which the facts that give rise to the revision become known. Historically, revisions have not resulted in material changes to research and development expense; however a modification in the protocol of a clinical trial or cancellation of a trial could result in a charge to our results of operations.

Recent Accounting Pronouncements

Information regarding recent accounting pronouncements is contained in Note 2 to the consolidated financial statements, included elsewhere in this report.

Results of Operations

The consolidated financial data for the years ended December 31, 2020, 2019 and 2018 is presented in the following table and the results of these periods are used in the discussion thereafter.

	Year Ended December 31,			Increase/(Decrease) 2020 vs. 2019		Increase/(Decrease) 2019 vs. 2018	
	2020	2019	2018	$	%	$	%
Revenues:							
Revenue under collaborative research and development arrangements, including from affiliated entities	$ 6,624,316	$ 3,872,594	$ 30,310,309	$ 2,751,722	71 %	$ (26,437,715)	(87)%
Other revenue, including from affiliated entities	786,904	239,336	171,588	547,568	229	67,748	39
Total revenues	7,411,220	4,111,930	30,481,897	3,299,290	80	(26,369,967)	(87)
Operating expenses:							
Research and development	94,245,436	88,017,319	95,257,876	6,228,117	7	(7,240,557)	(8)
General and administrative	37,247,828	27,203,156	29,315,159	10,044,672	37	(2,112,003)	(7)
Total operating expenses	131,493,264	115,220,475	124,573,035	16,272,789	14	(9,352,560)	(8)
Loss from operations	(124,082,044)	(111,108,545)	(94,091,138)	(12,973,499)	(12)	(17,017,407)	(18)
Interest income	3,311,846	2,605,981	2,264,747	705,865	27	341,234	15
Interest expense	(8,702,450)	(7,948,539)	—	(753,911)	9	(7,948,539)	*
Change in fair value of common stock warrants	—	—	360,795	—	—	(360,795)	*
Change in fair value of derivative liability	(75,670,977)	(1,763,652)	—	(73,907,325)	*	(1,763,652)	*
Gain (loss) on investment in affiliated entity	36,556,658	(3,090,557)	(1,988,567)	39,647,215	*	(1,101,990)	(55)
Net unrealized gain on available-for-sale equity securities	1,695,497	—	—	1,695,497	*	—	—
Other income (expense), net	(704,896)	496,200	(1,343,856)	(1,201,096)	*	1,840,056	*
Gain on deconsolidation of Geneos	4,121,075	—	—	4,121,075	*	—	—
Loss on extinguishment of convertible bonds	(8,177,043)	—	—	(8,177,043)	*	—	—
Gain on extinguishment of convertible senior notes	8,762,030	—	—	8,762,030	*	—	—
Net loss before income tax benefit/(provision for income tax)	(162,890,304)	(120,809,112)	(94,798,019)	(42,081,192)	(35)	(26,011,093)	(27)
Income tax benefit/(provision for income taxes)	—	257,335	(2,169,811)	(257,335)	*	2,427,146	*
Share in net loss of Geneos	(4,584,610)	—	—	(4,584,610)	*	—	—
Net loss	(167,474,914)	(120,551,777)	(96,967,830)	(46,923,137)	39	(23,583,947)	24
Net loss attributable to non-controlling interest	1,063,757	1,192,558	—	(128,801)	(11)	1,192,558	*
Net loss attributed to Inovio Pharmaceuticals, Inc.	$ (166,411,157)	$ (119,359,219)	$ (96,967,830)	$ (47,051,938)	(39)%	$ (22,391,389)	(23)%

*Not meaningful

Comparison of Years Ended December 31, 2020 and 2019

Revenue

Revenue primarily consisted of revenues under collaborative research and development arrangements, including arrangements with affiliated entities for the years ended December 31, 2020 and 2019. Our year over year total revenue increased $3.3 million, or 80%. The increase in revenue was primarily due to revenue earned from Advaccine and the milestone revenue earned from our affiliated entity Plumbline Life Sciences, Inc., or PLS, offset by a decrease in revenue recognized from our collaboration with AstraZeneca.

Research and Development Expenses

The $6.2 million increase in research and development expenses for the year ended December 31, 2020 as compared to 2019 was primarily due to higher drug manufacturing expenses and outside services related to our INO-4800 clinical trials of $17.1 million, an increase in engineering services related to our CELLECTRA® 3PSP device development and array automation project of $12.4 million, higher expensed device materials of $5.0 million, higher contract labor expense of $2.4 million, higher employee stock-based compensation expense of $2.1 million, higher drug manufacturing expenses related to our Wistar IPCAVD grant of $1.2 million and an increase in patent maintenance and milestone fees to Wistar of $1.1 million. These increases were offset by an increase in contra-research and development expense recorded from grant agreements of $33.5 million, among other variances.

Contributions received from current grant agreements and recorded as contra-research and development expense were $45.4 million and $11.9 million for the years ended December 31, 2020 and 2019, respectively. The increase year over year was primarily due to increases of $21.2 million, $10.0 million and $4.1 million earned under grants from the DoD, CEPI and Gates, respectively, related to INO-4800 and device development activities, partially offset by a decrease of $2.4 million earned from the Gates grant and Wistar sub-grant related to our dMAb technology, among other variances.

General and Administrative Expenses

The $10.0 million increase in general and administrative expenses for the year ended December 31, 2020 as compared to 2019 was primarily related to an increase in legal expenses of $5.2 million, an increase in expenses for work performed related to corporate marketing and communications of $3.1 million and higher employee and consultant stock-based compensation expense of $3.0 million, partially offset by a gain on foreign exchange of $2.2 million recorded as contra-general and administrative expense, among other variances.

Stock-based Compensation

Employee stock-based compensation cost is measured at the grant date, based on the fair value of the award, and is recognized as expense over the employee's requisite service period. Total employee stock-based compensation cost for the years ended December 31, 2020 and 2019 was $14.5 million and $9.8 million, of which $8.0 million and $5.9 million was included in research and development expenses and $6.5 million and $3.9 million was included in general and administrative expenses, respectively. The increase for 2020 compared to 2019 was primarily due to a higher weighted average grant date fair value for the awards granted in 2020, offset in part by the reversal of previously recorded stock option expense due to a reduction in force in the third quarter of 2019 and an option modification expense recorded in the second quarter of 2019. At December 31, 2020, there was $4.4 million of total unrecognized compensation cost related to unvested stock options, which we expect to recognize over a weighted-average period of 1.4 years, as compared to $3.4 million for the year ended December 31, 2019 expected to be recognized over a weighted-average period of 1.7 years. At December 31, 2020, there was $10.9 million of total unrecognized compensation cost related to unvested restricted stock units, which is expected to be recognized over a weighted-average period of 1.9 years, as compared to $4.3 million for the year ended December 31, 2019 expected to be recognized over a weighted-average period of 1.6 years. Total stock-based compensation for options granted to non-employees for the years ended December 31, 2020 and 2019 was $1.2 million and $970,000, respectively.

Interest Income

The $706,000 increase in interest income for the year ended December 31, 2020 as compared to 2019 was primarily due to more interest earned on our higher balance of short-term investment holdings.

Interest Expense

The $754,000 increase in interest expense for the year ended December 31, 2020 as compared to 2019 was primarily due to higher interest expense recorded from our August 2019 Bonds and December 2019 Bonds, which were issued during the third and fourth quarters of 2019, respectively.

Change in Fair Value of Derivative Liability

The change in fair value of derivative liability for the year ended December 31, 2020 and 2019 was $75.7 million and $1.8 million, respectively. We determined that our August 2019 Bonds included an embedded conversion feature that was considered to be a derivative liability requiring bifurcation from the debt instrument and separate recognition in our financial statements. The conversion feature was revalued at the end of each reporting period and immediately prior to the conversion of the August 2019 Bonds in August 2020, with the resulting changes in fair value reflected in the consolidated statements of operations. The derivative liability was derecognized upon the conversion in full of the August 2019 Bonds.

Gain (Loss) on Investment in Affiliated Entity

The gain (loss) on investment in affiliated entity for the years ended December 31, 2020 and 2019 was $36.6 million and $(3.1) million, respectively, resulting from the change in the fair market value of our investments in GeneOne and PLS. During the third quarter of 2020, we sold our full equity interest in GeneOne. We record our investment in PLS at its market value

based on the closing price of the shares on the Korea New Exchange Market at each balance sheet date, with changes in fair value reflected in the consolidated statements of operations.

Net Unrealized Gain on Available-for-Sale Equity Securities

The net unrealized gain on available-for-sale equity securities for the year ended December 31, 2020 of $1.7 million resulted from a change in the fair market value of our equity investments as of December 31, 2020.

Gain on Deconsolidation of Geneos

The gain recorded represents the excess of the fair value of our retained noncontrolling investment in Geneos and the carrying amount of the non-controlling interest over the carrying amount of Geneos's assets and liabilities as of June 1, 2020, the date of deconsolidation.

Loss on Extinguishment of Convertible Bonds

Upon the full conversion of our August 2019 Bonds, a loss of $8.2 million was recorded for the difference between the fair value of the derivative liability immediately prior to its derecognition plus the carrying amount of the debt component, and the fair value of our common stock issued upon conversion.

Gain on Extinguishment of Convertible Senior Notes

As a result of the partial conversions of the Notes during the third and fourth quarters of 2020, we recorded an $8.8 million gain on extinguishment calculated as the difference between the estimated fair value of the debt and the carrying value of the Notes as of the conversion dates.

Share in Net Loss of Geneos

The share in net loss of Geneos represents our share of Geneos's losses during the period after deconsolidation.

Income Tax Benefit/Provision for Income Taxes

The income tax benefit of $257,000 for the year ended December 31, 2019 reflected our application of the intraperiod tax allocation rules under which we are required to record a tax benefit in continuing operations to offset the tax provision we recorded directly to other comprehensive income (loss) related to unrealized gains on our short-term investments.

Income Taxes

Since inception, we have incurred operating losses and accordingly have not recorded a provision for U.S. income taxes for any of the periods presented. Utilization of net operating losses and tax credits are subject to a substantial annual limitation due to ownership change limitations provided by the Internal Revenue Code of 1986, as amended, or IRC. As of December 31, 2020, we had net operating loss carry forwards for U.S. federal, California and Pennsylvania income tax purposes of $566.2 million, $68.6 million and $75.3 million, respectively, net of the net operating losses that will expire due to IRC Section 382 limitations. We also had U.S. federal and state research and development tax credits of $19.8 million and $3.2 million, respectively, net of the federal research and development credits that will expire due to IRC Section 383 limitations. The net operating losses and credits began to expire during 2021.

Comparison of Years Ended December 31, 2019 and 2018

Revenue

Revenue primarily consisted of revenues under collaborative research and development arrangements, including arrangements with affiliated entities for the years ended December 31, 2019 and 2018. Our year over year total revenue decreased $26.4 million, or 87%. The decrease was primarily due to the recognition of a one-time upfront payment of $23.0 million from ApolloBio during the second quarter of 2018.

Research and Development Expenses

The $7.2 million decrease in research and development expenses for the year ended December 31, 2019 as compared to 2018 was primarily due to a decrease in expenses related to our collaboration with AstraZeneca of $2.9 million, a decrease in employee compensation expense of $2.6 million due to lower employee headcount and an increase in contra-research and development expense recorded from grant agreements of $2.4 million, as well as no sub-license fee expense in 2019 as compared to $1.9 million recorded in 2018 related to the ApolloBio collaboration. These decreases were offset by an increase in clinical trial related expenses of $3.5 million and the one-time personnel-related restructuring charge of approximately $1.9 million in connection with the employee termination costs incurred during the third quarter of 2019, among other variances.

Contributions received from current grant agreements and recorded as contra-research and development expense were $11.9 million and $9.5 million for the years ended December 31, 2019 and 2018, respectively. The increase year over year was primarily due to an increase of $1.9 million earned from the CEPI grant, an increase of $1.9 million from the Bill & Melinda

Gates Foundation grant and an increase of $890,000 from the MCDC grant, offset in part by decreases of $1.1 million and $963,000 from various Wistar sub-grants and the DARPA Ebola grant, respectively, among other variances.

General and Administrative Expenses

The $2.1 million decrease in general and administrative expenses for the year ended December 31, 2019 as compared to 2018 was primarily related to the $1.4 million of foreign non-income taxes withheld from the ApolloBio upfront payment we received in 2018 and the associated advisory fees of $960,000, among other variances.

Stock-based Compensation

Employee stock-based compensation cost is measured at the grant date, based on the fair value of the award, and is recognized as expense over the employee's requisite service period. Total employee stock-based compensation cost for the years ended December 31, 2019 and 2018 was $9.8 million and $10.2 million, of which $5.9 million and $5.9 million was included in research and development expenses and $3.9 million and $4.3 million was included in general and administrative expenses, respectively. The slight decrease for 2019 compared to 2018 was primarily due to the reversal of previously recognized stock-based compensation expense due to the reduction in our workforce in July 2019 and a lower weighted average grant date fair value for the awards granted in 2019, offset by an option modification expense recorded in the second quarter of 2019. At December 31, 2019, there was $3.4 million of total unrecognized compensation cost related to unvested stock options, which we expect to recognize over a weighted-average period of 1.7 years, as compared to $5.2 million for the year ended December 31, 2018 expected to be recognized over a weighted-average period of 1.7 years. At December 31, 2019, there was $4.3 million of total unrecognized compensation cost related to unvested restricted stock units, which is expected to be recognized over a weighted-average period of 1.6 years, as compared to $5.1 million for the year ended December 31, 2018 expected to be recognized over a weighted-average period of 1.7 years. Total stock-based compensation for options granted to non-employees for the years ended December 31, 2019 and 2018 was $970,000 and $302,000, respectively.

Interest Income

The $341,000 increase in interest income for the year ended December 31, 2019 as compared to 2018 was primarily related to the interest earned on our higher short-term investments holdings in 2019.

Interest Expense

The interest expense for the year ended December 31, 2019 of $7.9 million primarily relates to our 6.5% convertible senior notes due 2024, or the Notes, which were issued during the first quarter of 2019, as well as our 1.0% convertible bonds due August 2024, or the August 2019 Bonds, which were issued during the third quarter of 2019.

Change in Fair Value of Common Stock Warrants

The change in fair value of common stock warrants for the year ended December 31, 2018 was $361,000. The warrants were exercised during the quarter ended September 30, 2018, eliminating the associated fair value re-measurement in subsequent periods.

Change in Fair Value of Derivative Liability

The change in fair value of derivative liability for the year ended December 31, 2019 was $1.8 million. We determined that our August 2019 Bonds included an embedded conversion feature that is considered to be a derivative liability requiring bifurcation from the debt instrument and separate recognition in our financial statements. The conversion option is revalued at each reporting period with the resulting changes in fair value reflected in the consolidated statements of operations.

Loss on Investment in Affiliated Entity

The loss on investment in affiliated entity for the years ended December 31, 2019 and 2018 was $3.1 million and $2.0 million, respectively, resulting from the change in the fair market value of our investments in GeneOne and PLS. We record our investments in GeneOne and PLS at their market values based on the closing prices of those securities on the applicable stock exchange at each balance sheet date, with changes in fair value reflected in the consolidated statements of operations.

Income Tax Benefit/Provision for Income Taxes

The income tax benefit of $257,000 for the year ended December 31, 2019 reflected our application of the intraperiod tax allocation rules under which we are required to record a tax benefit in continuing operations to offset the tax provision we recorded directly to other comprehensive income (loss) related to unrealized gains on our short-term investments. The provision for income taxes of $2.2 million for the year ended December 31, 2018 was related to foreign income taxes on the upfront payment received from ApolloBio in 2018.

Income Taxes

Since inception, we have incurred operating losses and accordingly have not recorded a provision for U.S. income taxes for any of the periods presented. Utilization of net operating losses and tax credits are subject to a substantial annual limitation due to ownership change limitations provided by the IRC. As of December 31, 2019, we had net operating loss carry forwards for U.S. federal, California and Pennsylvania income tax purposes of $483.3 million, $68.6 million and $80.5 million, respectively, net of the net operating losses that will expire due to IRC Section 382 limitations. We also had U.S. federal and state research and development tax credits of $17.3 million and $3.2 million, respectively, net of the federal research and development credits that will expire due to IRC Section 383 limitations. The net operating losses and credits began to expire during 2020.

Liquidity and Capital Resources

Historically, our primary uses of cash have been to finance research and development activities including clinical trial activities in the oncology, DNA vaccines and other immunotherapy areas of our business. Since inception, we have satisfied our cash requirements principally from proceeds from the sale of equity securities, indebtedness and grants and government contracts.

Working Capital and Liquidity

As of December 31, 2020, we had cash and short-term investments of $411.6 million and working capital of $429.5 million, as compared to $89.5 million and $62.2 million as of December 31, 2019, respectively. The increase in cash and short-term investments during the year ended December 31, 2020 was primarily due to the net proceeds from the sale of our common stock under at-the-market, or ATM, sales agreements, offset by expenditures related to our research and development activities, clinical trials and various general and administrative expenses related to legal, consultants, accounting and audit, and corporate development.

Net cash used in operating activities for the year ended December 31, 2020 of $178.0 million consisted of net loss of $167.5 million less use of net cash in operating assets and liabilities of $71.1 million, partially offset by net non-cash adjustments of $60.6 million. The net cash used in operating activities included a $62.1 million increase in prepaid expenses and other assets, primarily comprising prepayments for facilities, equipment and manufacturing related to INO-4800 and a $17.9 million increase in accounts receivable primarily from the DoD. The primary non-cash adjustments to net loss included the increase in fair value of derivative liability of $75.7 million prior to its derecognition, stock-based compensation of $15.6 million, share of net loss in Geneos of $4.6 million, interest expense of $4.1 million and depreciation and amortization of $3.6 million, offset by gain on investment in affiliated entities of $36.6 million and gain on deconsolidation of Geneos of $4.1 million, among other items.

Net cash used in operating activities for the year ended December 31, 2019 of $97.9 million consisted of net loss of $120.6 million less use of net cash in operating assets and liabilities of $3.5 million, partially offset by net non-cash adjustments of $26.2 million. The primary non-cash expenses added back to net loss included stock-based compensation of $10.9 million, interest expense of $5.2 million, depreciation and amortization of $4.7 million and loss on investment in affiliated entities of $3.1 million and change in fair value of derivative liability of $1.8 million.

Net cash used in investing activities was $58.8 million and $9.0 million for the years ended December 31, 2020 and 2019, respectively. The variance was primarily the result of timing differences in short-term investment purchases, sales and maturities, offset by the proceeds from the sale of our investment in GeneOne of $40.1 million.

Net cash provided by financing activities was $465.3 million and $105.4 million for the years ended December 31, 2020 and 2019, respectively. The variance was primarily due to the significantly higher net proceeds from the sale of common stock under the ATM sales agreement as well as proceeds from stock option exercises in 2020, offset by the net proceeds received in 2019 from the issuance of Notes and August 2019 and December 2019 Bonds.

Issuances of Notes and Bonds

In December 2019, we completed a private placement of our 1.0% convertible bonds due December 2024, or the December 2019 Bonds, to an institutional investor in Korea for an aggregate principal amount of 4.7 billion Korean Won (KRW) (approximately USD $4.1 million based on the exchange rate on the date of issuance). Net proceeds from the offering were $4.0 million, after deducting the offering expenses payable by us.

In August 2019, we completed a private placement of aggregate principal amount of 18 billion Korean Won (KRW) (approximately USD $15.0 million based on the exchange rate on the date of issuance) of August 2019 Bonds issued to institutional investors led by Korea Investment Partners. Net proceeds from the offering were $14.5 million, after deducting the offering expenses payable by us. In August 2020, the August 2019 Bonds were fully converted into 4,692,364 shares of our common stock.

In the first quarter of 2019, we completed a private placement of $78.5 million aggregate principal amount of Notes, sold to qualified institutional buyers pursuant to Rule 144A under the Securities Act of 1933, as amended. Net proceeds from the

offering were $75.7 million, after deducting the initial purchasers' discount and offering expenses payable by us. During 2020, certain holders of the Notes converted principal amount of $62.1 million into an aggregate of 11,535,660 shares of our common stock. As of December 31, 2020, $16.4 million aggregate principal amount of Notes remains outstanding. See Note 11 to the consolidated financial statements included in this report for further discussion.

Issuances of Common Stock

In May 2018, we entered into an At-the-Market Equity Offering Sales Agreement, or the Sales Agreement, with an outside placement agent, or the Placement Agent, to sell shares of our common stock with aggregate gross proceeds of up to $100.0 million, from time to time, through an "at-the-market" equity offering program under which the Placement Agent would act as sales agent. During the year ended December 31, 2019, we sold 3,340,678 shares of common stock under the Sales Agreement for aggregate net proceeds of $9.1 million.

In the first quarter of 2020, we entered into amendments to the Sales Agreement to increase the amount of our common stock that could be sold through the Placement Agent under the Sales Agreement to an aggregate offering price of up to $250.0 million. During the three months ended March 31, 2020, we sold 43,148,952 shares of common stock under the Sales Agreement for aggregate net proceeds of $208.2 million. Following these sales, there was no remaining capacity under this Sales Agreement.

On April 3, 2020, we entered into a new sales agreement, or the New Sales Agreement, with the same Placement Agent to sell shares of our common stock. On that same day, we filed a prospectus supplement pursuant to the New Sales Agreement for the offer and sale of our common stock for aggregate gross proceeds of up to $150.0 million. On May 12, 2020 we filed an additional prospectus supplement pursuant to the New Sales Agreement for the offer and sale of our common stock for an additional $100.0 million of gross proceeds, bringing the maximum gross proceeds of sales under the New Sales Agreement to $250.0 million. Through December 31, 2020, we sold 22,915,934 shares of common stock under the New Sales Agreement for aggregate net proceeds of $246.2 million. As of December 31, 2020, there was no remaining capacity under the New Sales Agreement.

On January 25, 2021, we closed an underwritten public offering of 20,355,000 shares of our common stock at a public offering price of $8.50 per share. The net proceeds, after deducting the underwriters' discounts and commissions and other estimated offering expenses payable by us, were $162.1 million.

During the year ended December 31, 2020, stock options to purchase 2,178,252 shares of common stock were exercised for aggregate net proceeds of $12.3 million, which proceeds were offset by tax payments made related to net share settlement of RSU awards of $4.0 million. During the year ended December 31, 2019, stock options to purchase 42,969 shares of common stock were exercised for aggregate net proceeds of $113,000, which proceeds were offset by tax payments made related to net share settlement of RSU awards of $893,000. During the year ended December 31, 2018, stock options and warrants to purchase 756,853 shares of common stock were exercised for aggregate net proceeds of $2.4 million, which proceeds were offset by tax payments made related to net share settlement of RSU awards of $612,000.

As of December 31, 2020, we had an accumulated deficit of $906.2 million and we expect to continue to operate at a loss for some time. The amount of the accumulated deficit will continue to increase, as it will be expensive to continue research and development efforts. These activities will require additional financing. If these activities are successful and if we receive approval from the FDA to market our DNA vaccine and DNA immunotherapy product candidates, then we will need to raise additional funding to market and sell the approved products and equipment. We cannot predict the outcome of the above matters at this time. We are evaluating potential collaborations as an additional way to fund operations. We believe that our current cash and short-term investments are sufficient to meet our planned working capital requirements for at least the next twelve months.

Off-Balance Sheet Arrangements

We did not have during the periods presented, and we do not currently have, any off-balance sheet arrangements, as defined in the rules and regulations of the SEC.

Contractual Obligations

As of December 31, 2020, future minimum payments due under our contractual obligations are as follows:

	Payments Due by Period				
	Total	Less than 1 year	1 – 3 years	3 – 5 years	More than 5 years
Convertible senior notes (1)	$ 20,149,000	$ 1,067,000	$ 2,134,000	$ 16,948,000	$ —
Convertible bonds (2)	$ 5,701,000	$ 43,000	$ 87,000	$ 5,571,000	$ —
Operating lease obligations (3)	$ 27,988,000	$ 3,968,000	$ 8,068,000	$ 6,064,000	$ 9,888,000

(1) Amounts represent remaining contractual amounts due under our Notes, including interest based on the fixed rate of 6.5% per year. Although these Notes mature in March 2024, they may be converted into shares of our common stock prior to maturity if certain conditions are met. Any conversion prior to maturity would result in repayments of the principal amounts sooner than the scheduled repayments as indicated in the table. During 2020, certain holders of the Notes converted principal amount of $62.1 million into an aggregate of 11,535,660 shares of our common stock. See Note 11, "Convertible Debt" in the Consolidated Financial Statements section of this report for further discussion.

(2) Amounts represent contractual amounts due under our December 2019 Bonds, including interest based on the fixed rate of 1% per year plus a premium on such bonds to provide an internal rate of return with respect to such Bonds of 6% at maturity. Although these bonds mature in December 2024, they may be converted into equity securities prior to maturity if certain conditions are met. Any conversion prior to maturity can result in repayments of the principal amounts sooner than the scheduled repayments as indicated in the table. In August 2020, our August 2019 Bonds were fully converted into 4,962,364 shares of our common stock. See Note 11, "Convertible Debt" in the Consolidated Financial Statements section of this report for further discussion.

(3) We have entered into operating leases for our facilities, which expire from 2023 to 2029, and operating leases for office equipment, which expire in 2021 and 2022. In the fourth quarter of 2019, we entered into two subleases for a portion of our Plymouth Meeting corporate headquarters facility through December 31, 2022 and March 31, 2025. As of December 31, 2020, we expect to receive aggregate future minimum lease payments totaling $1.2 million (non-discounted) over the duration of the sublease agreements, which expected payments are not included in the table above.

In the normal course of business, we are a party to a variety of agreements pursuant to which we may be obligated to indemnify the other party. It is not possible to predict the maximum potential amount of future payments under these types of agreements due to the conditional nature of our obligations and the unique facts and circumstances involved in each particular agreement. Historically, payments made by us under these types of agreements have not had a material effect on our business, consolidated results of operations or financial condition.

ITEM 7A. QUALITATIVE AND QUANTITATIVE DISCLOSURES ABOUT MARKET RISK

Interest Rate Risk

Market risk represents the risk of loss that may impact our consolidated financial position, results of operations or cash flows due to adverse changes in financial and commodity market prices and rates. We are exposed to market risk primarily in the area of changes in United States interest rates and conditions in the credit markets, and the recent fluctuations in interest rates and availability of funding in the credit markets primarily impact the performance of our investments. We do not have any material foreign currency or other derivative financial instruments. Under our current policies, we do not use interest rate derivative instruments to manage exposure to interest rate changes. We attempt to increase the safety and preservation of our invested principal funds by limiting default risk, market risk and reinvestment risk. We mitigate default risk by investing in investment grade securities. Due to the short-term maturities of our cash equivalents and the low risk profile of our investments at December 31, 2020, an immediate 100 basis point change in interest rates would not have a material effect on the fair market value of our cash equivalents.

The interest rate on our indebtedness, consisting exclusively of the Notes and Bonds, is fixed and not subject to fluctuations in interest rates.

Fair Value Measurements

The investment in affiliated entity at December 31, 2020 represents our ownership interest in the Korean-based company PLS. We report this investment at fair value on the consolidated balance sheet using the closing price of PLS shares of common stock as reported on the date of determination on the Korea New Exchange Market.

Foreign Currency Risk

We have operated primarily in the United States and most transactions during the year ended December 31, 2020 were made in United States dollars. Accordingly, we have not had any material exposure to foreign currency rate fluctuations, with

the exception of the sale of our investment in GeneOne, which was denominated in South Korean Won, the issuance of the August 2019 and December 2019 Bonds, which were and are denominated in South Korean Won, and the valuation of our equity investment in PLS, which is denominated in South Korean Won and then translated into United States dollars. We do not have any foreign currency hedging instruments in place.

Certain transactions are denominated primarily in foreign currencies, including South Korean Won, Euros, British Pounds and Canadian Dollars. These transactions give rise to monetary assets and liabilities that are denominated in currencies other than the U.S. dollar. The value of these monetary assets and liabilities are subject to changes in currency exchange rates from the time the transactions are originated until settlement in cash. As a result, our financial results could be affected by factors such as changes in foreign currency exchange rates or weak economic conditions in foreign markets where we conduct business.

We do not use derivative financial instruments for speculative purposes and do not engage in exchange rate hedging or hold or issue foreign exchange contracts for trading purposes.

ITEM 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA

The information required by this Item 8 is incorporated by reference to our Consolidated Financial Statements and the Report of Independent Registered Public Accounting Firm beginning at page F-1 of this report.

ITEM 9. CHANGES IN AND DISAGREEMENTS WITH ACCOUNTANTS ON ACCOUNTING AND FINANCIAL DISCLOSURE

None.

ITEM 9A. CONTROLS AND PROCEDURES

Evaluation of Disclosure Controls and Procedures

We maintain disclosure controls and procedures, which are designed to ensure that information required to be disclosed in the reports we file or submit under the Securities Exchange Act of 1934, as amended, is recorded, processed, summarized and reported within the time periods specified in the SEC's rules and forms, and that such information is accumulated and communicated to our management, including our Chief Executive Officer, or CEO, and Chief Financial Officer, or CFO, as appropriate to allow timely decisions regarding required disclosures.

In designing and evaluating our disclosure controls and procedures, management recognizes that disclosure controls and procedures, no matter how well conceived and operated, can provide only reasonable, not absolute, assurance that the objectives of the disclosure controls and procedures are met. Additionally, in designing disclosure controls and procedures, our management necessarily was required to apply its judgment in evaluating the cost-benefit relationship of possible disclosure controls and procedures. The design of any system of controls also is based in part upon certain assumptions about the likelihood of future events, and there can be no assurance that any design will succeed in achieving its stated goals under all potential future conditions; over time, controls may become inadequate because of changes in conditions, or the degree of compliance with policies or procedures may deteriorate. Because of the inherent limitations in a control system, misstatements due to error or fraud may occur and not be detected.

Based on an evaluation carried out as of the end of the period covered by this Annual Report, under the supervision and with the participation of our management, including our CEO and CFO, our CEO and CFO have concluded that, as of the end of such period, our disclosure controls and procedures (as defined in Rule 13a-15(e) and 15d-15(e) under the Securities Exchange Act of 1934) were effective as of December 31, 2020 at the reasonable assurance level.

Internal Control Over Financial Reporting

Management's Report on Internal Control Over Financial Reporting

Our management is responsible for establishing and maintaining adequate internal control over financial reporting, as defined in Rules 13a-15(f) and 15d-15(f) under the Securities Exchange Act of 1934. Our internal control over financial reporting is a process designed under the supervision of our Chief Executive Officer and Chief Financial Officer to provide reasonable assurance regarding the reliability of financial reporting and the preparation of our financial statements for external purposes in accordance with United States generally accepted accounting principles.

As of December 31, 2020, management, with the participation of the Chief Executive Officer and Chief Financial Officer, assessed the effectiveness of our internal control over financial reporting based on the criteria for effective internal control over financial reporting established in "Internal Control—Integrated Framework," issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework). Based on the assessment, management determined that we maintained effective internal control over financial reporting as of December 31, 2020.

Changes in Internal Control over Financial Reporting

There have not been any changes in our internal control over financial reporting that occurred during the fourth quarter of our fiscal year ended December 31, 2020, that materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

Attestation Report of Independent Registered Public Accounting Firm

The independent registered public accounting firm that audited the consolidated financial statements that are included in this Annual Report on Form 10-K has issued an audit report on the effectiveness of our internal control over financial reporting as of December 31, 2020. The report appears below.

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

The Board of Directors and Stockholders of Inovio Pharmaceuticals, Inc.

Opinion on Internal Control over Financial Reporting

We have audited Inovio Pharmaceuticals, Inc.'s internal control over financial reporting as of December 31, 2020, based on criteria established in Internal Control-Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission 2013 framework (the COSO criteria). In our opinion, Inovio Pharmaceuticals, Inc. (the Company) maintained, in all material respects, effective internal control over financial reporting as of December 31, 2020, based on the COSO criteria.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the consolidated balance sheets of the Company as of December 31, 2020 and 2019, the related consolidated statements of operations, comprehensive loss, stockholders' equity, and cash flows, for each of the three years in the period ended December 31, 2020 and related notes and our report dated March 1, 2021 expressed an unqualified opinion thereon.

Basis for Opinion

The Company's management is responsible for designing, implementing, and maintaining effective internal control over financial reporting and for its assessment of the effectiveness of internal control over financial reporting included in the accompanying Management's Report on Internal Control over Financial Reporting. Our responsibility is to express an opinion on the Company's internal control over financial reporting based on our audit. We conducted our audit in accordance with auditing standards generally accepted in the United States of America. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audit in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects.

Our audit included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, testing and evaluating the design and operating effectiveness of internal control based on the assessed risk, and performing such other procedures as we considered necessary in the circumstances. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Definition and Limitations of Internal Control Over Financial Reporting

A company's internal control over financial reporting is a process effected by those charged with governance, management, and other personnel, designed to provide reasonable assurance regarding the preparation of reliable financial statements in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and those charged with governance; and (3) provide reasonable assurance regarding prevention, or timely detection and correction of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent, or detect and correct, misstatements. Also, projections of any assessment of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

/s/ Ernst & Young LLP

San Diego, California
March 1, 2021

ITEM 9B. OTHER INFORMATION

None.

PART III

ITEM 10. DIRECTORS, EXECUTIVE OFFICERS AND CORPORATE GOVERNANCE

The information required by this Item 10 is hereby incorporated by reference from our definitive proxy statement, to be filed pursuant to Regulation 14A within 120 days after the end of our 2020 fiscal year, under the captions “Election of Directors” and “Executive Officers and Other Information.”

ITEM 11. EXECUTIVE COMPENSATION

The information required by this Item 11 is hereby incorporated by reference from our definitive proxy statement, to be filed pursuant to Regulation 14A within 120 days after the end of our 2020 fiscal year, under the captions “Compensation Discussion and Analysis,” “Executive Compensation,” “Compensation of Directors” and “Director Compensation Table.”

ITEM 12. SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT AND RELATED STOCKHOLDER MATTERS

The information required by this Item 12 is hereby incorporated by reference from our definitive proxy statement, to be filed pursuant to Regulation 14A within 120 days after the end of our 2020 fiscal year, under the captions “Security Ownership of Certain Beneficial Owners and Management” and “Equity Compensation Plan Information.”

ITEM 13. CERTAIN RELATIONSHIPS AND RELATED TRANSACTIONS, AND DIRECTOR INDEPENDENCE

Director independence and other information required by this Item 13 is hereby incorporated by reference from our definitive proxy statement, to be filed pursuant to Regulation 14A within 120 days after the end of our 2020 fiscal year, under the captions “Certain Relationships and Related Party Transactions” and “Election of Directors.”

ITEM 14. PRINCIPAL ACCOUNTING FEES AND SERVICES

The information required by this Item 14 is hereby incorporated by reference from our definitive proxy statement, to be filed pursuant to Regulation 14A within 120 days after the end of our 2020 fiscal year, under the caption “Ratification of Appointment of Registered Public Accounting Firm.”

PART IV

ITEM 15. EXHIBITS, FINANCIAL STATEMENT SCHEDULES

1. Financial Statements

   Consolidated financial statements required to be filed hereunder are indexed on Page F-1 hereof.

2. Financial Statement Schedules

   Schedules not listed herein have been omitted because the information required to be set forth therein is not applicable or is included in the Financial Statements or notes thereto.

3. Exhibits

   The following exhibits are filed as part of this annual report on Form 10-K:

Exhibit Number	Description of Document
3.1	Certificate of Incorporation with all amendments (incorporated by reference to Exhibit 3.1 of the registrant's Form S-3 registration statement, filed on July 23, 2014).
3.2	Amended and Restated Bylaws of Inovio Pharmaceuticals, Inc. dated August 10, 2011 (incorporated by reference to Exhibit 3.2 to the registrant's Form 8-K current report filed on August 12, 2011).
4.1	Indenture, dated as of February 19, 2019, by and between the registrant and U.S. Bank National Association, as trustee (incorporated by reference to Exhibit 4.1 to the registrant's current report on Form 8-K filed with the SEC on February 20, 2019).
4.2	Form of Note representing the registrant's 6.50% Convertible Senior Notes due 2024 (included as Exhibit A to the Indenture filed as Exhibit 4.1).
4.3	Convertible Bonds Subscription Agreement, dated July 31, 2019, by and among the registrant and the Purchasers named therein (incorporated by reference to Exhibit 4.1 to the registrant's current report on Form 8-K filed with the SEC on August 6, 2019).
4.4	Form of Bond representing the registrant's 1% Convertible Bonds due 2024 (included as Exhibit A to the Convertible Bonds Subscription Agreement filed as Exhibit 4.3).
4.5	Registration Rights Agreement, dated July 31, 2019, by and among the registrant and the Purchasers named therein (incorporated by reference to Exhibit 99.1 to the registrant's current report on Form 8-K filed with the SEC on August 6, 2019).
4.6	Convertible Bonds Subscription Agreement, dated December 26, 2019, by and between the registrant and the Purchaser named therein (incorporated by reference to Exhibit 4.1 to the registrant's current report on Form 8-K filed with the SEC on January 2, 2020).
4.7	Form of Bond representing the registrant's 1% Convertible Bonds due 2024 (included as Exhibit A to the Convertible Bonds Subscription Agreement filed as Exhibit 4.6).
4.8	Registration Rights Agreement, dated December 26, 2019, by and between the registrant and the Purchaser named therein (incorporated by reference to Exhibit 10.1 to the registrant's current report on Form 8-K filed with the SEC on January 2, 2020).
4.9	Description of the Registrant's Securities Registered Pursuant to Section 12 of the Securities Exchange Act of 1934, as amended (incorporated by reference to Exhibit 4.9 to the registrant's annual report on Form 10-K filed with the SEC on March 12, 2020).
10.1†	R&D Alliance Agreement dated December 19, 2005 by and between Ganial Immunotherapeutics, Inc. and VGX Pharmaceuticals, Inc., as amended by Novation and Amendment Agreement by and between VGX Pharmaceuticals, Inc., Ganial Immunotherapeutics, Inc., and Onconox (incorporated by reference to Exhibit 10.31 as filed with the registrant's Registration Statement on Form S-4 (File No. 333-156035) on April 27, 2009).

10.2†	R&D Collaboration and License Agreement dated December 18, 2006 by and between VGX International, Inc. and VGX Pharmaceuticals, Inc., as amended by First Amendment dated October 31, 2007 and as amended by Second Amendment dated August 4, 2008 (incorporated by reference to Exhibit 10.39 as filed with the registrant's Registration Statement on Form S-4 (File No. 333-156035) on April 27, 2009).
10.3†	Patent License Agreement dated April 27, 2007 by and between The Trustees of the University of Pennsylvania and VGX Pharmaceuticals, Inc., as amended by First Amendment dated June 12, 2008 (incorporated by reference to Exhibit 10.50 as filed with the registrant's Registration Statement on Form S-4 (File No. 333-156035) on April 27, 2009).
10.4†	License Agreement dated May 9, 2007 by and between Baylor University and VGX Pharmaceuticals, Inc. (incorporated by reference to Exhibit 10.34 as filed with the registrant's registration statement on Form S-4 (File No. 333-156035) on April 27, 2009).
10.5	At-the-Market Equity Offering Sales Agreement dated May 25, 2018 between Inovio Pharmaceuticals, Inc. and Stifel, Nicolaus & Company, Incorporated (incorporated by reference to Exhibit 1.1 of the registrant's Form 8-K filed on May 25, 2018).
10.6†	License and Collaboration Agreement dated March 24, 2010 between Inovio Pharmaceuticals, Inc. and VGX International, Inc. (incorporated by reference to Exhibit 10.2 as filed with the registrant's Form 10-Q quarterly report for the quarter ended March 31, 2010 filed on May 17, 2010).
10.7†	Collaborative Development and License Agreement dated October 7, 2011 between VGX International, Inc. and Inovio Pharmaceuticals, Inc., as amended by First Amendment dated August 21, 2013, and Second Amendment dated October 7, 2013 (incorporated by reference to Exhibit 10.1 as filed with the registrant's Form 10-Q quarterly report for the quarter ended September 30, 2011 filed on November 7, 2011).
10.8†	DNA Cancer Vaccine Collaboration and License Agreement dated August 7, 2015 by and between MedImmune, Limited and Inovio Pharmaceuticals, Inc. (incorporated by reference to Exhibit 10.1 of the registrant's Form 10-Q quarterly report for the quarter ended September 30, 2015 filed on November 9, 2015).
10.9	Collaborative Research Agreement dated March 14, 2016 by and between The Wistar Institute of Anatomy and Biology, a Commonwealth of Pennsylvania nonprofit corporation, and Inovio Pharmaceuticals, Inc. (incorporated by reference to Exhibit 10.1 as filed with the registrant's Form 10-Q quarterly report for the quarter ended March 31, 2016 filed on May 9, 2016).
10.10	Collaborative Research Agreement dated March 14, 2016 by and between The Wistar Institute of Anatomy and Biology, a Commonwealth of Pennsylvania nonprofit corporation, and Inovio Pharmaceuticals, Inc. (incorporated by reference to Exhibit 10.2 as filed with the registrant's Form 10-Q quarterly report for the quarter ended March 31, 2016 filed on May 9, 2016).
10.11†	Amended and Restated License and Collaboration Agreement, dated December 29, 2017, by and between Inovio Pharmaceuticals, Inc. and Beijing Apollo Saturn Biological Technology Limited (incorporated by reference to Exhibit 10.12 as filed with the registrant's Form 10-K annual report for the year ended December 31, 2017 filed on March 14, 2018).
10.12††	Other Transaction Authority For Prototype Agreement dated June 22, 2020 between Inovio Pharmaceuticals, Inc. and Natick Contracting Division (incorporated by reference to Exhibit 10.1 as filed with the registrant's Form 10-Q quarterly report for the quarter ended June 30, 2020 filed on August 10, 2020).
10.13††	Award Agreement dated June 18, 2020 between Inovio Pharmaceuticals, Inc. and Natick Contracting Division (incorporated by reference to Exhibit 10.2 as filed with the registrant's Form 10-Q quarterly report for the quarter ended June 30, 2020 filed on August 10, 2020).
10.14††	Collaboration and License Agreement dated December 31, 2020 between Inovio Pharmaceuticals, Inc. and Advaccine Biopharmaceuticals Suzhou Co., Ltd. (filed herewith).
10.15	Lease dated April 9, 2013 by and between BMR-Wateridge LP and Inovio Pharmaceuticals, Inc. (incorporated by reference to Exhibit 10.1 to registrant's quarterly report for the quarter ended March 31, 2013, filed on May 10, 2013).

10.16	Lease Agreement dated as of March 5, 2014 between Brandywine Operating Partnership L.P. and Inovio Pharmaceuticals, Inc. (incorporated by reference to Exhibit 10.36 as filed with the registrant's Form 10-K annual report for the year ended December 31, 2014 filed on March 17, 2014).
10.17	Office Lease Agreement dated October 10, 2016 by and between 6759 Mesa Ridge Road Holdings, LLC and Inovio Pharmaceuticals, Inc. (incorporated by reference to Exhibit 10.1 as filed with the registrant's Form 10-Q quarterly report for the quarter ended September 30, 2016 filed on November 9, 2016).
10.18	Sublease dated June 21, 2017 between Accolade, Inc. and Inovio Pharmaceuticals, Inc. (incorporated by reference to Exhibit 10.2 as filed with the registrant's Form 10-Q quarterly report for the quarter ended June 30, 2017 filed on August 8, 2017).
10.19	Second Amendment to the Lease Agreement dated June 22, 2017 between Brandywine Operating Partnership, L.P. and Inovio Pharmaceuticals, Inc. (incorporated by reference to Exhibit 10.1 as filed with the registrant's Form 10-Q quarterly report for the quarter ended June 30, 2017 filed on August 8, 2017).
10.20+	Employment Agreement dated March 31, 2008 by and between J. Joseph Kim, Ph.D. and VGX Pharmaceuticals, Inc., as amended by First Amendment of Employment Agreement dated March 31, 2008 (incorporated by reference to Exhibit 10.43 as filed with the registrant's Registration Statement on Form S-4 (File No. 333-156035) on April 27, 2009).
10.21+	First Amendment to Employment Agreement dated as of December 31, 2012 between Inovio Pharmaceuticals, Inc. and J. Joseph Kim, PhD. (incorporated by reference to Exhibit 10.41 of the registrant's Form 10-K annual report for the year ended December 31, 2012 filed on March 18, 2013).
10.23+	Employment Agreement dated as of December 27, 2010 between Inovio Pharmaceuticals, Inc. and Peter Kies (incorporated by reference to Exhibit 10.5 to the registrant's Form 10-K report for the year ended December 31, 2010 filed on March 16, 2011).
10.24+	First Amendment to Employment Agreement dated as of December 31, 2012 between Inovio Pharmaceuticals, Inc. and Peter Kies (incorporated by reference to Exhibit 10.42 of the registrant's Form 10-K annual report for the year ended December 31, 2012 filed on March 18, 2013).
10.25+	Second Amendment to Employment Agreement dated November 7, 2014 by and between Inovio Pharmaceuticals, Inc. and Peter Kies (incorporated by reference to Exhibit 10.2 of the registrant's Form 10-Q quarterly report for the quarter ended September 30, 2014 filed on November 10, 2014).
10.26+	Employment Agreement dated March 8, 2019 between Inovio Pharmaceuticals, Inc. and Jacqueline E. Shea (incorporated by reference to Exhibit 10.26 of the registrant's Form 10-K annual report for the year ended December 31, 2019 filed on March 12, 2020).
10.27+	Employment Agreement dated as of March 4, 2019 between Inovio Pharmaceuticals, Inc. and Laurent M. Humeau (incorporated by reference to Exhibit 10.27 of the registrant's Form 10-K annual report for the year ended December 31, 2019 filed on March 12, 2020).
10.28+	Form of Indemnification Agreement for Directors and Officers of Inovio Pharmaceuticals, Inc. (incorporated by reference to Exhibit 10.1 to the registrant's Form 10-Q quarterly report for the quarterly period ended June 30, 2009, filed on August 19, 2009).
10.29+	Amended and Restated 2007 Omnibus Incentive Plan, as amended (incorporated by reference to Exhibit 10.12 to the registrant's Form 10-K report for the year ended December 31, 2015 filed on March 14, 2016).
10.30+	Form of Incentive and Non-Qualified Stock Option Grants under the 2007 Omnibus Stock Incentive Plan (incorporated by reference to Exhibit 4.4 to the registrant's Registration Statement on Form S-8 filed on May 14, 2007).
10.31+	Inovio Pharmaceuticals, Inc. 2016 Omnibus Incentive Plan, as amended to date (incorporated by reference to Exhibit 10.1 to the registrant's Form 8-K filed on May 10, 2019).

10.32+	Form of Incentive Stock Option Agreement under 2016 Omnibus Incentive Plan. (incorporated by reference to Exhibit 10.55 as filed with the registrant's Form 10-K annual report for the year ended December 31, 2016 filed on March 15, 2017.)
10.33+	Form of Nonqualified Stock Option Agreement under 2016 Omnibus Incentive Plan. (incorporated by reference to Exhibit 10.56 as filed with the registrant's Form 10-K annual report for the year ended December 31, 2016 filed on March 15, 2017.)
10.34+	Form of Restricted Stock Units Award Agreement under 2016 Omnibus Incentive Plan. (incorporated by reference to Exhibit 10.54 as filed with the registrant's Form 10-K annual report for the year ended December 31, 2016 filed on March 15, 2017.)
21.1	Subsidiaries of the registrant (filed herewith).
23.1	Consent of Independent Registered Public Accounting Firm (filed herewith).
24.1	Power of Attorney (included on signature page).
31.1	Certification of the Principal Executive Officer pursuant to Section 302 of the Sarbanes-Oxley Act of 2002 (filed herewith).
31.2	Certification of the Principal Financial Officer pursuant to Section 302 of the Sarbanes-Oxley Act of 2002 (filed herewith).
32.1^	Certification of the Principal Executive Officer and Principal Financial Officer pursuant to 18 U.S.C. 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002 (furnished herewith).
101.INS	XBRL Instance Document (the instance document does not appear in the Interactive Data File because its XBRL tags are embedded within the Inline XBRL document).
101.SCH	XBRL Taxonomy Extension Schema Document.
101.CAL	XBRL Taxonomy Extension Calculation Linkbase Document.
101.DEF	XBRL Taxonomy Extension Definition Linkbase Document.
101.LAB	XBRL Taxonomy Extension Label Linkbase Document.
101.PRE	XBRL Taxonomy Extension Presentation Linkbase Document.
104	Cover Page Interactive Data File (formatted as Inline XBRL and contained in Exhibit 101)

\+ Designates management contract, compensatory plan or arrangement.

† Confidential treatment has been granted for certain portions omitted from this exhibit (indicated by asterisks) pursuant to Rule 24b-2 under the Securities Exchange Act of 1934, as amended. The confidential portions of this exhibit have been separately filed with the Securities and Exchange Commission.

†† Certain confidential portions of this exhibit (indicated by asterisks) were omitted pursuant to applicable regulations.

^ These certifications are being furnished solely to accompany this Annual Report pursuant to 18 U.S.C. Section 1350, and are not being filed for purposes of Section 18 of the Securities Exchange Act of 1934, as amended, and are not to be incorporated by reference into any filing of the registrant, whether made before or after the date hereof, regardless of any general incorporation language in such filing.

ITEM 16. FORM 10-K SUMMARY

Not applicable.

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the Registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized on March 1, 2021.

Inovio Pharmaceuticals, Inc.

By: /s/ J. JOSEPH KIM

J. Joseph Kim
President and Chief Executive Officer

POWER OF ATTORNEY

KNOW ALL PERSONS BY THESE PRESENTS, that each person whose signature appears below constitutes and appoints J. Joseph Kim and Peter Kies, and each of them severally, his or her true and lawful attorney-in-fact with power of substitution and resubstitution to sign in his or her name, place and stead, in any and all capacities, to do any and all things and execute any and all instruments that such attorney may deem necessary or advisable under the Securities Exchange Act of 1934 and any rules, regulations and requirements of the United States Securities and Exchange Commission in connection with the Annual Report on Form 10-K and any and all amendments hereto, as fully for all intents and purposes as he or she might or could do in person, and hereby ratifies and confirms all said attorneys-in-fact and agents, each acting alone, and his or her substitute or substitutes, may lawfully do or cause to be done by virtue hereof.

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of the Registrant and in the capacities and on the dates indicated.

Signature	Title	Date
/s/ J. JOSEPH KIM **J. Joseph Kim**	President, Chief Executive Officer and Director (Principal Executive Officer)	March 1, 2021
/s/ SIMON X. BENITO **Simon X. Benito**	Chairman of the Board of Directors	March 1, 2021
/s/ PETER KIES **Peter Kies**	Chief Financial Officer (Principal Accounting Officer and Principal Financial Officer)	March 1, 2021
/s/ ANN MILLER **Ann Miller**	Director	March 1, 2021
/s/ JAY SHEPARD **Jay Shepard**	Director	March 1, 2021
/s/ DAVID WEINER **David Weiner**	Director	March 1, 2021
/s/ WENDY YARNO **Wendy Yarno**	Director	March 1, 2021
/s/ LOTA ZOTH **Lota Zoth**	Director	March 1, 2021

INOVIO PHARMACEUTICALS, INC.

Index to Consolidated Financial Statements

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

The Board of Directors and Stockholders of Inovio Pharmaceuticals, Inc.

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheets of Inovio Pharmaceuticals, Inc. (the "Company") as of December 31, 2020 and 2019, the related consolidated statements of operations, comprehensive loss, stockholders' equity, and cash flows, for each of the three years in the period ended December 31, 2020, and the related notes (collectively referred to as the "consolidated financial statements"). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company as of December 31, 2020 and 2019, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2020, in conformity with U.S. generally accepted accounting principles.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the Company's internal control over financial reporting as of December 31, 2020, based on criteria established in Internal Control-Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 Framework) and our report dated March 1, 2021 expressed an unqualified opinion thereon.

Basis for Opinion

These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on the Company's financial statements based on our audits. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the US federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement, whether due to error or fraud. Our audits included performing procedures to assess the risks of material misstatement of the financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures include examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the financial statements. We believe that our audits provide a reasonable basis for our opinion.

Critical Audit Matters

The critical audit matters communicated below are matters arising from the current period audit of the financial statements that were communicated or required to be communicated to the audit committee and that: (1) relate to accounts or disclosures that are material to the financial statements and (2) involved our especially challenging, subjective or complex judgments. The communication of critical audit matters does not alter in any way our opinion on the consolidated financial statements, taken as a whole, and we are not, by communicating the critical audit matters below, providing separate opinions on the critical audit matters or on the accounts or disclosures to which they relate.

	Valuation of Debt Instruments
Description of the Matter	As described in Note 11 to the consolidated financial statements, for the year ended December 31, 2020, the Company recorded $75.7 million related to the change in the fair value of the August 2019 Convertible Bond embedded derivative liability. Management measured the fair value of the embedded derivative liability using the Monte Carlo simulation model and techniques that require management to make several assumptions. Auditing management's valuations of the derivative liability was especially challenging due to the complexity of valuation model and the inputs that are highly sensitive to changes such as volatility, risk free rates, conversion rate and yield.

How We Addressed the Matter in our Audit	We obtained an understanding, evaluated the design and tested the operating effectiveness of controls relating to management's valuation of the August 2019 Convertible Bond embedded derivative liability. These procedures also included, among others, the involvement of professionals with specialized skill and knowledge to assist in developing an independent estimate of the valuation to compare to management's assumptions. Additionally, we tested the mathematical accuracy of the valuation model and agreed certain inputs to underlying source information.
	Accrual of Clinical Trial Expenses
Description of the Matter	During 2020, the Company incurred $94.2 million for research and development expenses and as of December 31, 2020 accrued $10.0 million for clinical study costs. A substantial portion of the Company's ongoing research and development activities are conducted by third-party service providers, including clinical research organizations ("CROs"). External costs to be paid to CROs are accrued and expensed based upon actual work completed in accordance with signed agreements. Auditing management's accounting for accrued clinical study costs is especially challenging because the evaluation is dependent upon a high-volume of data and input exchanged between clinical personnel and third-party service providers, such as the number of sites activated, the number of patients enrolled, and the number of patient visits, which is tracked in spreadsheets and other end user computing programs.
How We Addressed the Matter in our Audit	We obtained an understanding, evaluated the design and tested the operating effectiveness of controls over the accounting for accrued clinical trial expenses. For example, we tested controls over management's assessment and measurement of estimated accrued clinical study costs, including patient enrollment and total cost incurred to date from third-parties. To test the completeness of the Company's accrued clinical trial expenses, we obtained from third-parties confirmation of patient enrollment and direct service cost to date for significant clinical trials. We attended internal clinical trial and project status meetings with accounting personnel and the clinical project manager to understand the status of significant clinical trial activities. To assess the appropriate measurement of accrued clinical trial expenses, we inspected key terms, timelines of completion, activities and costs for a sample of vendor contracts, including amendments, and compared these to management's analyses used in tracking the progress of service agreements. We also tested a sample of subsequent payments by agreeing the invoice to the original accrual and the invoice payments to bank statements.

/s/ Ernst & Young LLP

We have served as the Company's auditor since 2002.

San Diego, California

March 1, 2021

Inovio Pharmaceuticals, Inc.

CONSOLIDATED BALANCE SHEETS

	December 31,	
	2020	**2019**
ASSETS		
Current assets:		
Cash and cash equivalents	$ 250,728,118	$ 22,196,097
Short-term investments	160,914,935	67,338,017
Accounts receivable	18,559,967	700,073
Accounts receivable from affiliated entities	503,782	1,332,044
Prepaid expenses and other current assets	40,357,456	1,584,598
Prepaid expenses and other current assets from affiliated entities	106,432	1,050,140
Total current assets	471,170,690	94,200,969
Fixed assets, net	11,348,144	12,773,017
Investments in affiliated entities	4,460,366	6,315,356
Investment in Geneos	434,387	—
Intangible assets, net	3,146,770	3,693,851
Goodwill	10,513,371	10,513,371
Operating lease right-of-use assets	12,741,296	13,783,009
Other assets	25,957,448	2,672,024
Total assets	$ 539,772,472	$ 143,951,597
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Accounts payable and accrued expenses	$ 21,203,808	$ 18,237,258
Accounts payable and accrued expenses due to affiliated entities	642,969	729,729
Accrued clinical trial expenses	9,950,345	4,049,727
Deferred revenue	46,628	92,353
Deferred revenue from affiliated entities	—	31,775
Operating lease liability	2,329,394	2,074,842
Grant funding liability	7,474,310	6,065,212
Grant funding liability from affiliated entities	58,500	708,425
Total current liabilities	41,705,954	31,989,321
Deferred revenue, net of current portion	79,214	101,567
Convertible senior notes	14,139,988	64,180,325
Convertible bonds	4,515,834	12,842,592
Derivative liability	—	8,819,023
Operating lease liability, net of current portion	18,063,515	20,409,922
Deferred tax liabilities	32,046	32,046
Grant funding liability from affiliated entity, net of current portion	37,500	135,000
Other liabilities	57,663	36,943
Total liabilities	78,631,714	138,546,739
Commitments and contingencies		
Inovio Pharmaceuticals, Inc. stockholders' equity:		
Preferred stock—par value $0.001; Authorized shares: 10,000,000, issued and outstanding shares: 9 at December 31, 2020 and 23 at December 31, 2019	—	—
Common stock—par value $0.001; Authorized shares: 600,000,000 at December 31, 2020 and December 31, 2019, issued and outstanding: 186,851,493 at December 31, 2020 and 101,361,034 at December 31, 2019	186,851	101,361
Additional paid-in capital	1,367,406,869	742,646,785
Accumulated deficit	(906,196,812)	(739,785,655)
Accumulated other comprehensive income (loss)	(256,150)	472,608
Total Inovio Pharmaceuticals, Inc. stockholders' equity	461,140,758	3,435,099
Non-controlling interest	—	1,969,759
Total stockholders' equity	461,140,758	5,404,858
Total liabilities and stockholders' equity	$ 539,772,472	$ 143,951,597

The accompanying notes are an integral part of these consolidated financial statements.

Inovio Pharmaceuticals, Inc.

CONSOLIDATED STATEMENTS OF OPERATIONS

	For the Year ended December 31,		
	2020	**2019**	**2018**
Revenues:			
Revenue under collaborative research and development arrangements	$ 5,170,586	$ 3,636,945	$ 29,860,785
Revenue under collaborative research and development arrangements from affiliated entities	1,453,730	235,649	449,524
Other revenue	786,904	237,536	171,588
Other revenue from affiliated entities	—	1,800	—
Total revenues	7,411,220	4,111,930	30,481,897
Operating expenses:			
Research and development	94,245,436	88,017,319	95,257,876
General and administrative	37,247,828	27,203,156	29,315,159
Total operating expenses	131,493,264	115,220,475	124,573,035
Loss from operations	(124,082,044)	(111,108,545)	(94,091,138)
Other income (expense):			
Interest income	3,311,846	2,605,981	2,264,747
Interest expense	(8,702,450)	(7,948,539)	—
Change in fair value of common stock warrants	—	—	360,795
Change in fair value of derivative liability	(75,670,977)	(1,763,652)	—
Gain (loss) on investment in affiliated entities	36,556,658	(3,090,557)	(1,988,567)
Net unrealized gain on available-for-sale equity securities	1,695,497	—	—
Other income (expense), net	(704,896)	496,200	(1,343,856)
Gain on deconsolidation of Geneos	4,121,075	—	—
Loss on extinguishment of convertible bonds	(8,177,043)	—	—
Gain on extinguishment of convertible senior notes	8,762,030	—	—
Net loss before income tax benefit/(provision for income tax)	(162,890,304)	(120,809,112)	(94,798,019)
Income tax benefit (provision for income taxes)	—	257,335	(2,169,811)
Share in net loss of Geneos	(4,584,610)	—	—
Net loss	(167,474,914)	(120,551,777)	(96,967,830)
Net loss attributable to non-controlling interest	1,063,757	1,192,558	—
Net loss attributable to Inovio Pharmaceuticals, Inc.	$ (166,411,157)	$ (119,359,219)	$ (96,967,830)
Net loss per share attributable to Inovio Pharmaceuticals, Inc. stockholders			
Basic and diluted	$ (1.07)	$ (1.21)	$ (1.05)
Weighted average number of common shares outstanding			
Basic and diluted	155,126,857	98,717,999	92,539,997

The accompanying notes are an integral part of these consolidated financial statements.

Inovio Pharmaceuticals, Inc.

CONSOLIDATED STATEMENTS OF COMPREHENSIVE LOSS

	For the Year ended December 31,		
	2020	**2019**	**2018**
Net loss	$ (167,474,914)	$ (120,551,777)	$ (96,967,830)
Other comprehensive income (loss):			
Foreign currency translation	27,205	—	—
Unrealized gain (loss) on short-term investments, net of tax	(755,963)	1,001,475	(180,496)
Comprehensive loss	$ (168,203,672)	$ (119,550,302)	$ (97,148,326)
Comprehensive loss attributable to non-controlling interest	1,063,757	1,192,558	—
Comprehensive loss attributable to Inovio Pharmaceuticals, Inc.	$ (167,139,915)	$ (118,357,744)	$ (97,148,326)

The accompanying notes are an integral part of these consolidated financial statements.

Inovio Pharmaceuticals, Inc.

CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY

	Preferred stock		Common stock		Additional paid-in capital	Accumulated deficit	Accumulated other comprehensive income (loss)	Non-controlling interest	Total stockholders' equity
	Number of shares	Amount	Number of shares	Amount					
Balance at December 31, 2017	23	—	90,357,644	$ 90,358	$ 665,775,504	$ (523,356,317)	$ (117,005)	$ 96,269	$ 142,488,809
Cumulative effect of accounting change (1)	—	—	—	—	—	231,366	(231,366)	—	—
Issuance of common stock for cash	—	—	5,669,025	5,669	29,222,107	—	—	—	29,227,776
Exercise of stock options and warrants for cash and vesting of RSUs, net of tax payments	—	—	1,199,141	1,199	1,808,327	—	—	—	1,809,526
Stock-based compensation	—	—	—	—	10,988,277	(333,655)	—	—	10,654,622
Net loss attributable to common stockholders	—	—	—	—	—	(96,967,830)	—	—	(96,967,830)
Unrealized loss on short-term investments	—	—	—	—	—	—	(180,496)	—	(180,496)
Balance at December 31, 2018	23	—	97,225,810	$ 97,226	$ 707,794,215	$ (620,426,436)	$ (528,867)	$ 96,269	$ 87,032,407
Issuance of common stock for cash	—	—	3,340,678	3,340	9,085,669	—	—	—	9,089,009
Exercise of stock options for cash and vesting of RSUs, net of tax payments	—	—	794,546	795	(781,200)	—	—	—	(780,405)
Equity component of issuance of convertible notes	—	—	—	—	15,752,698	—	—	—	15,752,698
Stock-based compensation	—	—	—	—	10,795,403	—	—	105,917	10,901,320
Acquisition of non-controlling interest in Geneos, net	—	—	—	—	—	—	—	2,960,131	2,960,131
Net loss attributable to common stockholders	—	—	—	—	—	(119,359,219)	—	(1,192,558)	(120,551,777)
Unrealized gain on short-term investments, net of tax	—	—	—	—	—	—	1,001,475	—	1,001,475
Balance at December 31, 2019	23	—	101,361,034	$ 101,361	$ 742,646,785	$ (739,785,655)	$ 472,608	$ 1,969,759	$ 5,404,858
Issuance of common stock for cash	—	—	66,064,886	66,065	454,420,335	—	—	—	454,486,400
Conversion of preferred stock to common stock	(14)	—	5,147	5	(5)	—	—	—	—
Conversion of senior notes to common stock	—	—	11,535,660	11,536	43,682,850	—	—	—	43,694,386
Conversion of August 2019 Bonds to common stock	—	—	4,962,364	4,961	102,666,349	—	—	—	102,671,310
Exercise of stock options for cash and vesting of RSUs, net of tax payments	—	—	2,922,402	2,923	8,238,701	—	—	—	8,241,624
Stock-based compensation	—	—	—	—	15,655,585	—	—	(8,062)	15,647,523
Acquisition of non-controlling interest in Geneos, net	—	—	—	—	—	—	—	2,379,969	2,379,969
Deconsolidation of Geneos	—	—	—	—	—	—	—	(3,181,640)	(3,181,640)
Net loss attributable to common stockholders	—	—	—	—	—	(166,411,157)	—	(1,063,757)	(167,474,914)
Dissolution of majority-owned subsidiary VGX Animal Health, Inc.	—	—	—	—	96,269	—	—	(96,269)	—
Unrealized loss on short-term investments, net of tax	—	—	—	—	—	—	(755,963)	—	(755,963)
Foreign currency translation	—	—	—	—	—	—	27,205	—	27,205
Balance at December 31, 2020	9	—	186,851,493	$ 186,851	$ 1,367,406,869	$ (906,196,812)	$ (256,150)	$ —	$ 461,140,758

(1) Upon adoption of ASU 2016-01 on January 1, 2018, the Company began to measure and record equity investments, except those accounted for under the equity method of accounting that have a readily determinable fair value, at fair value and began to recognize the changes in fair value in its consolidated statements of operations, instead of recognizing unrealized gains and losses through accumulated other comprehensive income (loss), as done under the previous guidance. The Company recorded a $231,000 cumulative effect adjustment to reclassify the cumulative unrealized gain, net of tax effect, from its investment in an affiliated entity, PLS, from accumulated other comprehensive loss to accumulated deficit.

The accompanying notes are an integral part of these consolidated financial statements.

Inovio Pharmaceuticals, Inc.

CONSOLIDATED STATEMENTS OF CASH FLOWS

	For the Year ended December 31,		
	2020	**2019**	**2018**
Cash flows from operating activities:			
Net loss	$ (167,474,914)	$ (120,551,777)	$ (96,967,830)
Adjustments to reconcile net loss to net cash used in operating activities:			
Depreciation	3,038,996	3,598,388	3,747,183
Amortization of intangible assets	547,081	1,066,294	1,249,584
Amortization of operating lease right-of-use assets	1,041,713	851,760	—
Change in fair value of common stock warrants	—	—	(360,795)
Change in fair value of derivative liability	75,670,977	1,763,652	—
Stock-based compensation	15,647,523	10,901,320	10,654,622
Non-cash interest expense	4,077,686	5,230,954	—
Amortization of premiums on investments	—	1,962	72,561
Deferred taxes	—	5,397	—
Loss (gain) on short-term investments	588,270	(476,368)	1,342,005
Settlement of receivable with shares of common stock from affiliated entity (PLS)	(1,713,770)	—	—
Gain on deconsolidation of Geneos	(4,121,075)	—	—
Loss on disposal of fixed assets	26,913	5,889	14,529
(Gain) loss on equity investment in affiliated entities	(36,556,658)	3,090,557	1,988,567
Share of net loss in Geneos	4,584,610	—	—
Loss on extinguishment of convertible August 2019 bonds	8,177,043	—	—
Gain on extinguishment of convertible senior notes	(8,762,030)	—	—
Net unrealized gain on available-for-sale equity securities	(1,695,497)	—	—
Tax benefit from other unrealized gains on short-term investments	—	(266,215)	—
Unrealized transaction loss on foreign-currency denominated debt	15,902	471,172	—
Changes in operating assets and liabilities:			
Accounts receivable	(17,859,894)	2,616,288	2,686,844
Accounts receivable from affiliated entities	844,423	(593,461)	(251,964)
Prepaid expenses and other current assets	(38,849,572)	(178,008)	1,194,316
Prepaid expenses and other current assets from affiliated entities	374,107	70,665	725,202
Other assets	(23,285,424)	(2,026)	(30,644)
Accounts payable and accrued expenses	3,115,828	(4,337,829)	550,407
Accrued clinical trial expenses	5,962,381	(1,622,037)	(2,940,128)
Accounts payable and accrued expenses due to affiliated entities	135,650	(248,063)	50,849
Deferred revenue	(68,078)	(180,450)	(1,016,836)
Deferred revenue from affiliated entities	5,725	(1,800)	(140,535)
Deferred rent	—	—	(398,357)
Operating lease right-of-use assets and liabilities, net	(2,091,855)	(1,733,599)	—
Grant funding liability	1,409,098	1,899,364	4,165,848
Grant funding liability from affiliated entities	(784,925)	816,342	27,083
Other liabilities	20,720	(48,507)	87,333
Net cash used in operating activities	(177,979,046)	(97,850,136)	(73,550,156)
Cash flows from investing activities:			
Purchases of investments	(156,216,677)	(100,950,301)	(88,155,046)
Proceeds from sale of or maturity of investments	62,991,023	92,893,232	132,659,976
Purchases of capital assets	(1,520,665)	(987,926)	(2,085,022)
Proceeds from sale of investment of GeneOne	40,125,418	—	—
Decrease of cash resulting from the deconsolidation of Geneos	(2,774,851)	—	—
Investment in Geneos	(1,399,999)	—	—
Net cash (used in) provided by investing activities	(58,795,751)	(9,044,995)	42,419,908
Cash flows from financing activities:			
Proceeds from issuances of convertible senior notes and convertible bonds	—	97,443,617	—
Costs related to issuances of convertible senior notes and convertible bonds	—	(3,314,757)	—
Proceeds from issuance of common stock, net of issuance costs	454,486,400	9,089,010	29,227,776
Proceeds from stock option and warrant exercises, net of tax payments	12,269,801	112,522	2,421,136
Taxes paid related to net share settlement of equity awards, net of proceeds from option exercises	(4,028,177)	(892,928)	(611,610)
Acquisition of non-controlling interest	2,379,969	2,960,131	—
Proceeds from Geneos issuance of note payable	171,620	—	—
Net cash provided by financing activities	465,279,613	105,397,595	31,037,302
Effect of exchange rate changes on cash and cash equivalents	27,205	—	—
Increase (decrease) in cash and cash equivalents	228,532,021	(1,497,536)	(92,946)
Cash and cash equivalents, beginning of period	22,196,097	23,693,633	23,786,579
Cash and cash equivalents, end of period	$ 250,728,118	$ 22,196,097	$ 23,693,633
Supplemental disclosure:			
Amounts accrued for purchases of property and equipment	$ 136,711	$ —	$ 559,646
Interest paid	$ 4,624,764	$ 2,717,585	$ —
Equity component of issuance of convertible notes	$ —	$ 15,752,698	$ —
Right-of-use assets obtained in exchange for lease obligations	$ —	$ 14,634,769	$ —

The accompanying notes are an integral part of these consolidated financial statements.

1. The Company

Inovio Pharmaceuticals, Inc. (the "Company" or "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 human papillomavirus (HPV). INOVIO's DNA medicines pipeline is comprised of three types of product candidates: DNA vaccines, DNA immunotherapies and DNA encoded monoclonal antibodies (dMAbs®). In clinical trials, INOVIO has demonstrated that DNA medicines can be delivered directly into cells in the body through its proprietary smart device to consistently activate robust and fully functional T cell and antibody responses against targeted pathogens and cancers.

The Company's novel DNA medicine candidates are made using its proprietary SynCon® technology that uses a computer algorithm designed to identify and optimize the DNA sequence of the target antigen (be it virus or a tumor). INOVIO then creates optimized plasmids, which are circular strands of DNA that instruct a cell to produce antigens to help the person's immune system recognize and destroy cancerous or virally infected cells.

INOVIO's patented CELLECTRA® smart delivery devices provide optimized uptake of its DNA medicines within the cell, overcoming a key limitation of other DNA-based technology approaches.

Human clinical trial data to date has shown a favorable safety profile of INOVIO's DNA medicines delivered directly into cells in the body using the CELLECTRA® smart device in more than 7,000 administrations across more than 3,000 patients.

INOVIO's corporate strategy is to advance, protect and, once approved, commercialize its novel DNA medicines to meet urgent and emerging global health needs. The Company continues to advance and clinically validate an array of DNA medicine candidates that target HPV-associated diseases, cancer, and infectious diseases, such as COVID-19 (SARS-CoV-2). The Company aims to advance these candidates through commercialization and continue to leverage third-party resources through collaborations and partnerships, including product license agreements.

The Company's partners and collaborators include ApolloBio Corporation., AstraZeneca, Beijing Advaccine, The Bill & Melinda Gates Foundation, Coalition for Epidemic Preparedness Innovations (CEPI), The U.S. Department of Defense (DoD), Defense Advanced Research Projects Agency (DARPA), GeneOne Life Science, HIV Vaccines Trial Network, the U.S. Defense Threat Reduction Agency's Medical CBRN Defense Consortium (MCDC), International Vaccine Institute (IVI), National Cancer Institute, National Institutes of Health, National Institute of Allergy and Infectious Diseases, Ology Bioservices, the Parker Institute for Cancer Immunotherapy, Plumbline Life Sciences, Regeneron Pharmaceuticals, Inc., Richter-Helm BioLogics, Thermo Fisher Scientific, the University of Pennsylvania, the Walter Reed Army Institute of Research, and The Wistar Institute.

The Company and its collaborators are currently conducting or planning clinical studies of its DNA medicines for HPV-associated precancers, including cervical, vulvar, and anal dysplasia; HPV-associated cancers, including head & neck, cervical, anal, penile, vulvar, and vaginal; other HPV-associated disorders, such as recurrent respiratory papillomatosis (RRP); glioblastoma multiforme (GBM); prostate cancer; HIV; Ebola; Middle East Respiratory Syndrome (MERS); Lassa fever; Zika virus; and the COVID-19 virus (coronavirus).

INOVIO was incorporated in Delaware in June 2001 and has its principal executive offices in Plymouth Meeting, Pennsylvania.

2. Summary of Significant Accounting Policies

Basis of Presentation and Liquidity

INOVIO incurred a net loss attributable to common stockholders of $166.4 million for the year ended December 31, 2020. INOVIO had working capital of $429.5 million and an accumulated deficit of $906.2 million as of December 31, 2020. The Company has incurred losses in each year since its inception and expects to continue to incur significant expenses and operating losses for the foreseeable future in connection with the research and preclinical and clinical development of its product candidates. The Company's cash, cash equivalents and short-term investments of $411.6 million as of December 31, 2020, are sufficient to support the Company's operations for a period of at least 12 months from the date it is issuing these financial statements. The Company has evaluated subsequent events after the balance sheet date through the date it issued these consolidated financial statements.

In order to continue to fund future research and development activities, the Company will need to seek additional capital. This may occur through strategic alliance and licensing arrangements, grant agreements and/or future public or private debt or equity financings including use of potential future At-the-Market Equity Offering Sales Agreements ("Sales Agreements"). The Company has a history of conducting debt and equity financings, including the receipt of net proceeds under past Sales

Agreements of $454.5 million during the year ended December 31, 2020, and net proceeds of $9.1 million under a Sales Agreement during the year ended December 31, 2019. The Company also received net proceeds of $75.7 million from a private placement of 6.50% convertible senior notes due 2024 (the “Notes”), net proceeds of $14.5 million from the private placement of 18 billion Korean Won (KRW) (approximately USD $15.0 million based on the exchange rate on the date of issuance) aggregate principal amount of its 1.0% convertible bonds due August 2024 (the "August 2019 Bonds"), and net proceeds of $4.0 million from the private placement of 4.7 billion KRW (approximately USD $4.1 million based on the exchange rate on the date of issuance) aggregate principal amount of its 1.0% convertible bonds due December 2024 (the "December 2019 Bonds" and, together with the August 2019 Bonds, the “Bonds”) during the year ended December 31, 2019. However, sufficient funding may not be available in the future, or if available, may be on terms that significantly dilute or otherwise adversely affect the rights of existing stockholders. If adequate funds are not available, the Company may need to delay, reduce the scope of or put on hold one or more of its clinical and/or preclinical programs.

In June 2020, the Company formed a wholly-owned subsidiary, Inovio Asia LLC, under the laws of South Korea, through which the Company intends to advance its corporate development projects and other functions in South Korea and other Asian countries.

From time to time, the Company may be subject to various legal proceedings and claims arising in the ordinary course of business. The Company assesses contingencies to determine the degree of probability and range of possible loss for potential accrual in its consolidated financial statements. An estimated loss contingency is accrued in the consolidated financial statements if it is probable that a liability has been incurred and the amount of the loss can be reasonably estimated. Legal proceedings, including litigation, government investigations and enforcement actions, could result in material costs, occupy significant management resources and entail civil and criminal penalties, even if the Company ultimately prevails. Any of the foregoing consequences could result in serious harm to the Company’s business, results of operations and financial condition.

The Company’s ability to continue its operations is dependent upon its ability to obtain additional capital in the future and achieve profitable operations. The Company expects to continue to rely on outside sources of financing to meet its capital needs and the Company may never achieve positive cash flow.

Risks and Uncertainties

The global pandemic resulting from COVID-19, caused by a novel strain of coronavirus, SARS-CoV-2, has caused national and global economic and financial market disruptions. The impact of this pandemic has been and will likely continue to be extensive in many aspects of society, which has resulted in and will continue to cause significant disruptions to the global economy, as well as businesses and capital markets around the world.

The Company is closely monitoring the impact of the COVID-19 pandemic on its employees, collaborators and service providers. The extent to which the pandemic will impact the Company's business and operations will depend on future developments, including the duration of the outbreak, travel restrictions and social distancing in the United States and other countries, and the effectiveness of actions taken in the United States and other countries to contain and treat the disease, that are highly uncertain.

Consolidation

The consolidated financial statements include the accounts of Inovio Pharmaceuticals, Inc. and its subsidiaries. As of December 31, 2020 the Company consolidated its wholly-owned subsidiary Inovio Asia LLC. On December 31, 2020, former wholly-owned subsidiaries Genetronics, Inc. and VGX Pharmaceuticals Inc. and former majority -owned subsidiary VGX Animal Health, Inc. were merged into Inovio Pharmaceuticals, Inc. All intercompany accounts and transactions have been eliminated upon consolidation. As of June 1, 2020, the Company deconsolidated its former subsidiary Geneos Therapeutics, Inc. ("Geneos"), as the Company no longer held a controlling financial interest. Refer to Footnote 19 for further discussion of Geneos.

Segment Reporting

Operating segments are identified as components of an enterprise about which separate discrete financial information is available for evaluation by the chief operating decision-maker in making decisions regarding resource allocation and assessing performance. The Company views its operations and manages its business as one segment operating primarily within the United States.

Use of Estimates

The preparation of consolidated financial statements in conformity with U.S. GAAP requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities, disclosures of contingent assets and liabilities at the date of the consolidated financial statements and the reported amounts of revenues and expenses during the reporting period. Actual results could differ from those estimates.

Concentration of Credit Risk

Financial instruments that potentially subject the Company to concentrations of credit risk consist primarily of cash and short-term investments. The Company limits its exposure to credit loss by placing its cash and investments with high credit quality financial institutions. Additionally, the Company has established guidelines regarding diversification of its investments and their maturities which are designed to maintain principal and maximize liquidity.

The Company has contracts with certain of its customers that have represented more than 10% of the Company's total revenues, as discussed in Note 7.

Fair Value of Financial Instruments

The Company's financial instruments consist principally of cash equivalents, short-term investments and investments in affiliated entities. The carrying amounts of cash equivalents approximate the related fair values due to the short-term maturities of these instruments. Investments are recorded at fair value, based on current market valuations. The Company carries convertible notes and bonds at face value less unamortized debt discount and issuance costs on its consolidated balance sheet, and it presents the fair value of such convertible notes and bonds for disclosure purposes only.

Cash and Cash Equivalents

Cash equivalents are considered by the Company to be highly liquid investments purchased with original maturities of three months or less from the date of purchase. Cash and cash equivalents included certain money market accounts and U.S. treasury securities at December 31, 2020 and money market accounts at December 31, 2019.

Investments

The Company defines investments as income-yielding securities that can be readily converted into cash or equity investments classified as available-for-sale. Investments included mutual funds, U.S. treasury securities, certificates of deposit, U.S. agency mortgage-backed securities and an equity investment in the Company's affiliated entity, PLS, at December 31, 2020. Investments included mutual funds and an equity investment in the Company's affiliated entities, PLS and GeneOne, at December 31, 2019.

Accounts Receivable

Accounts receivable are recorded at invoiced amounts and do not bear interest. The Company performs ongoing credit evaluations of its customers' financial condition. Credit is extended to customers as deemed necessary and generally does not require collateral. Management believes that the risk of loss is significantly reduced due to the quality and financial position of the Company's customers. No allowance for doubtful accounts was deemed necessary at December 31, 2020 and 2019.

Fixed Assets

Property and equipment are stated at cost and depreciated using the straight-line method over the estimated useful life of the assets, generally three to five years. Leasehold improvements are amortized over the shorter of the remaining term of the related leases or the estimated economic useful lives of the improvements. Repairs and maintenance are expensed as incurred.

Long-Lived Assets

All long-lived assets are reviewed for impairment in value when changes in circumstances dictate, based upon undiscounted future operating cash flows, and appropriate losses are recognized and reflected in current earnings, to the extent the carrying amount of an asset exceeds its estimated fair value determined by the use of appraisals, discounted cash flow analyses or comparable fair values of similar assets. The Company has not recognized any losses on long-lived assets through December 31, 2020.

Valuation of Intangible Assets and Goodwill

Intangible assets are amortized over their estimated useful lives ranging from two to 18 years. Acquired intangible assets are continuously being developed for the future economic viability contemplated at the time of acquisition. The Company is concurrently conducting preclinical studies and clinical trials using the acquired intangibles and has entered into licensing agreements for the use of these acquired intangibles.

Historically, the Company has recorded patents at cost and amortized these costs using the straight-line method over the expected useful lives of the patents or 17 years, whichever is less. Patent cost consists of the consideration paid for patents and related legal costs. New patent costs are expensed as incurred, with patent costs capitalized as of that date continuing to be amortized over the expected life of the patent. License costs are recorded based on the fair value of consideration paid and are amortized using the straight-line method over the shorter of the expected useful life of the underlying patents or the term of the related license agreement to the extent the license has an alternative future use. As of December 31, 2019 and 2018, the Company's intangible assets resulting from acquisitions and additional intangibles including previously capitalized patent costs and license costs, net of accumulated amortization, totaled $3.1 million and $3.7 million, respectively.

The determination of the value of intangible assets requires management to make estimates and assumptions that affect the Company's consolidated financial statements. The Company assesses potential impairments to intangible assets when there is evidence that events or changes in circumstances indicate that the carrying amount of an asset may not be recovered. The Company's judgments regarding the existence of impairment indicators and future cash flows related to intangible assets are based on operational performance of its acquired businesses, market conditions and other factors. If impairment is indicated, the Company will reduce the carrying value of the intangible asset to fair value. While current and historical operating and cash flow losses are potential indicators of impairment, the Company believes the future cash flows to be received from its intangible assets will exceed the intangible assets' carrying value, and accordingly, the Company has not recognized any impairment losses through December 31, 2020.

Goodwill represents the excess of acquisition cost over the fair value of the net assets of acquired businesses. Goodwill is reviewed for impairment at least annually at November 30, or more frequently if an event occurs indicating the potential for impairment. During its goodwill impairment review, the Company may assess qualitative factors to determine whether it is more likely than not that the fair value of its reporting unit is less than its carrying amount, including goodwill. The qualitative factors include, but are not limited to, macroeconomic conditions, industry and market considerations, and the overall financial performance of the Company. If, after assessing the totality of these qualitative factors, the Company determines that it is not more likely than not that the fair value of its reporting unit is less than its carrying amount, then no additional assessment is deemed necessary. Otherwise, the Company proceeds to perform the two-step test for goodwill impairment. The first step involves comparing the estimated fair value of the reporting unit with its carrying value, including goodwill. If the carrying amount of the reporting unit exceeds its fair value, the Company performs the second step of the goodwill impairment test to determine the amount of loss, which involves comparing the implied fair value of the goodwill to the carrying value of the goodwill. The Company may also elect to bypass the qualitative assessment in a period and elect to proceed to perform the first step of the goodwill impairment test. The Company performed its annual assessment for goodwill impairment as of November 30, 2020, identifying no impairment.

Although there are inherent uncertainties in this assessment process, the estimates and assumptions the Company is using are consistent with its internal planning. If these estimates or their related assumptions change in the future, the Company may be required to record an impairment charge on all or a portion of its goodwill and intangible assets. Furthermore, the Company cannot predict the occurrence of future impairment triggering events nor the impact such events might have on its reported asset values. Future events could cause the Company to conclude that impairment indicators exist and that goodwill or other intangible assets associated with its acquired businesses are impaired. Any resulting impairment loss could have an adverse impact on the Company's results of operations. See Note 10 for further discussion of the Company's goodwill and intangible assets.

Income Taxes

The Company recognizes deferred tax assets and liabilities for temporary differences between the financial reporting basis and the tax basis of the Company's assets and liabilities along with net operating loss and tax credit carry forwards. The Company records a valuation allowance against its deferred tax assets to reduce the net carrying value to an amount that it believes is more likely than not to be realized. When the Company establishes or reduces the valuation allowance against its deferred tax assets, its provision for income taxes will increase or decrease, respectively, in the period such determination is made.

Valuation allowances against the Company's deferred tax assets were $159.7 million and $137.2 million at December 31, 2020 and 2019, respectively. Changes in the valuation allowances, when they are recognized in the provision for income taxes, are included as a component of the estimated annual effective tax rate.

Collaboration Agreements

The Company assesses whether its collaboration agreements are subject to Accounting Standards Codification ("ASC") Topic 808: Collaborative Arrangements ("Topic 808") based on whether they involve joint operating activities and whether both parties have active participation in the arrangement and are exposed to significant risks and rewards. To the extent that the arrangement falls within the scope of Topic 808, the Company assesses whether the payments between the Company and the collaboration partner are subject to other accounting literature. If payments from the collaboration partner to the Company represent consideration from a customer, then the Company accounts for those payments within the scope of Accounting Standards Update ("ASU") 2014-09, *Revenue from Contracts with Customers* ("Topic 606"). However, if the Company concludes that its collaboration partner is not a customer for certain activities, such as for certain collaborative research and development activities, the Company presents such payments as a reduction of research and development expense.

Revenue Recognition

The Company recognizes revenue when it transfers promised goods or services to customers in an amount that reflects the consideration to which it expects to be entitled in exchange for those goods or services. To determine revenue recognition for contracts with customers, the Company performs the following five steps: (i) identify the contract(s) with a customer; (ii) identify the performance obligations in the contract; (iii) determine the transaction price; (iv) allocate the transaction price to the performance obligations in the contract; and (v) recognize revenue when (or as) the Company satisfies its performance obligations. At contract inception, the Company assesses the goods or services agreed upon within each contract and assess whether each good or service is distinct and determine those that are performance obligations. The Company then recognizes as revenue the amount of the transaction price that is allocated to the respective performance obligation when (or as) the performance obligation is satisfied.

Collaborative Arrangements

The Company enters into collaborative arrangements with partners that typically include payment of one or more of the following: (i) license fees; (ii) product supply services; (iii) milestone payments related to the achievement of developmental, regulatory, or commercial goals; and (iv) royalties on net sales of licensed products. Where a portion of non-refundable, upfront fees or other payments received are allocated to continuing performance obligations under the terms of a collaborative arrangement, they are recorded as deferred revenue and recognized as revenue when (or as) the underlying performance obligation is satisfied.

As part of the accounting for these arrangements, the Company must develop estimates and assumptions that require judgment of management to determine the underlying stand-alone selling price for each performance obligation which determines how the transaction price is allocated among the performance obligation. The standalone selling price may include items such as forecasted revenues, development timelines, discount rates and probabilities of technical and regulatory success. The Company evaluates each performance obligation to determine if it can be satisfied at a point in time or over time. In addition, variable consideration must be evaluated to determine if it is constrained and, therefore, excluded from the transaction price.

License Fees

If a license to intellectual property is determined to be distinct from the other performance obligations identified in the arrangement, the Company will recognize revenues from non-refundable, up-front fees allocated to the license when the license is transferred to the licensee and the licensee is able to use and benefit from the license. For licenses that are bundled with other promises, the Company utilizes judgment to assess the nature of the combined performance obligation to determine whether the combined performance obligation is satisfied over time or at a point in time and, if over time, the appropriate method of measuring progress for purposes of recognizing revenue. The Company evaluates the measure of progress each reporting period and, if necessary, adjusts the measure of performance and related revenue recognition.

Product Supply Services

Arrangements that include a promise for future supply of drug product for either clinical development or commercial supply at the licensee’s discretion are generally considered as options. The Company assesses if these options provide a material right to the licensee and if so, they are accounted for as separate performance obligations. The Company evaluates whether it is the principal or agent in the arrangement. The Company had determined that it is the principal in the current arrangements as the Company controls the product supply before it is transferred to the customer.

Milestone Payments

At the inception of each arrangement that includes milestone payments (variable consideration), the Company evaluates whether the milestones are considered probable of being reached and estimates the amount to be included in the transaction price using the most likely amount method. If it is probable that a significant revenue reversal would not occur, the associated milestone value is included in the transaction price. Milestone payments that are not within the Company's or its collaboration partner’s control, such as regulatory approvals, are generally not considered probable of being achieved until those approvals are received. The transaction price is then allocated to each performance obligation on a relative stand-alone selling price basis, for which the Company recognizes revenue as or when the performance obligations under the contract are satisfied. At the end of each subsequent reporting period, the Company re-evaluates the probability of achieving such milestones and any related constraint, and if necessary, adjusts its estimate of the overall transaction price. Any such adjustments are recorded on a cumulative catch-up basis, which would affect license, collaboration or other revenues and earnings in the period of adjustment.

Royalties

For arrangements that include sales-based royalties, including milestone payments based on the level of sales, and for which the license is deemed to be the predominant item to which the royalties relate, the Company recognizes revenue at the later of (i) when the related sales occur, or (ii) when the performance obligation to which some or all of the royalty has been allocated has been satisfied (or partially satisfied). To date, the Company has not recognized any royalty revenue resulting from any of its collaborative arrangements.

Grants

The Company accounts for various grant agreements under the contributions guidance under Subtopic 958-605, *Not-for-Profit Entities-Revenue Recognition*, which is outside the scope of Topic 606, as the government agencies granting the Company funds are not receiving reciprocal value for their contributions. All contributions received from current grant agreements are recorded as a contra-expense as opposed to revenue on the consolidated statement of operations.

Derivative Liabilities

The Company evaluates its debt and equity issuances to determine if those contracts or embedded components of those contracts qualify as derivatives requiring separate recognition in the Company's financial statements. The result of this accounting treatment is that the fair value of the embedded derivative is revalued at each balance sheet date and recorded as a liability, and the change in fair value during the reporting period is recorded in other income (expense) in the consolidated statements of operations. In circumstances where the embedded conversion option in a convertible instrument is required to be bifurcated and there are also other embedded derivative instruments in the convertible instrument that are required to be bifurcated, the bifurcated derivative instruments are accounted for as a single, compound derivative instrument. The classification of derivative instruments, including whether such instruments should be recorded as liabilities or as equity, is reassessed at the end of each reporting period. Derivative instrument liabilities are classified in the balance sheet as current or non-current based on whether or not net-cash settlement of the derivative instrument is expected within twelve months of the balance sheet date.

Foreign Currency Transactions

The functional and presentation currency of the Company is the U.S. dollar. Transactions denominated in a currency other than the functional currency are recorded on the initial recognition at the exchange rate at the date of the transaction. After initial recognition, monetary assets and liabilities denominated in foreign currency are remeasured at the end of each reporting period into the functional currency at the exchange rate at that date. Exchange differences are included in general and administrative expenses in the consolidated statement of operations. Non-monetary assets and liabilities measured at cost are remeasured at the exchange rate at the date of the transaction.

Variable Interest Entities (VIE)

The Company evaluates its ownership, contractual and other interests in entities that are not wholly-owned to determine if these entities are VIEs, and, if so, whether the Company is the primary beneficiary of the VIE. In determining whether the Company is the primary beneficiary of a VIE and therefore required to consolidate the VIE, the Company applies a qualitative approach that determines whether it has both (1) the power to direct the activities of the VIE that most significantly impact the VIE’s economic performance and (2) the obligation to absorb losses of, or the rights to receive benefits from, the VIE that could potentially be significant to that VIE. The Company will continuously perform this assessment, as changes to existing relationships or future transactions may result in the consolidation or deconsolidation of a VIE.

Equity Investments

Under ASC Topic 321, *Investments - Equity Securities,* the Company must measure equity investments (except those accounted for under the equity method, those that result in consolidation of the investee and certain other investments) at fair value and recognize any changes in fair value in the consolidated statement of operations. The Company can elect a measurement alternative for equity investments that do not have readily determinable fair values and do not qualify for the practical expedient in ASC Topic 820, *Fair Value Measurement,* to estimate fair value using the net asset value per share (or its equivalent). The Company's equity investments that do not have readily determinable fair values and do not qualify for the net asset value practical expedient for estimating fair value are measured at cost, less any impairments, plus or minus changes resulting from observable price changes in orderly transactions for identifiable or similar investments of the same issuer.

Research and Development Expenses

The Company’s activities have largely consisted of research and development efforts related to developing electroporation delivery technologies, DNA vaccines, DNA immunotherapies and dMAbs. Research and development expenses consist of expenses incurred in performing research and development activities including salaries and benefits, facilities and other overhead expenses, clinical trials, contract services and other outside expenses. Research and development expenses are charged to operations as they are incurred. These expenses result from the Company's independent research and development efforts as well as efforts associated with collaborations and licensing arrangements. The Company reviews and accrues clinical trial expense based on work performed, which relies on estimates of total trial management costs, sites activated, patients enrolled, and number of patient visits. The Company follows this method since reasonably dependable estimates of the costs applicable to various stages of a research agreement or clinical trial can be made. Accrued clinical trial costs are subject to revisions as trials progress. Revisions are charged to expense in the period in which the facts that give rise to the revision become known. Historically, revisions have not resulted in material changes to research and development expense; however, a modification in the protocol of a clinical trial or cancellation of a trial could result in a charge to the Company's results of operations.

Net Loss Per Share

Basic net loss per share is computed by dividing the net loss for the year by the weighted average number of common shares outstanding during the year. Diluted net loss per share is calculated in accordance with the treasury stock method for the outstanding stock options and restricted stock units and reflects the potential dilution that would occur if securities or other contracts to issue common stock were exercised or converted to common stock. The dilutive impact of the outstanding Notes and Bonds issued by the Company (discussed in Note 11) has been considered using the "if-converted" method. The calculation of diluted net loss per share requires that, to the extent the average market price of the underlying shares for the reporting period exceeds the exercise price of the options or other securities and the presumed exercise of such securities are dilutive to net loss per share for the period, an adjustment to net loss used in the calculation is required to remove the change in fair value of such securities from the numerator for the period. Likewise, an adjustment to the denominator is required to reflect the related dilutive shares, if any. For the years ended December 31, 2020, 2019 and 2018, basic and diluted net loss per share are the same, as the assumed exercise or settlement of stock options, restricted stock units and the potentially dilutive shares issuable upon conversion of the Notes and Bonds are antidilutive.

The following table summarizes potential shares of common stock that were excluded from diluted net loss per share calculation because of their anti-dilutive effect:

	Year Ended December 31,		
	2020	2019	2018
Options to purchase common stock	8,906,624	9,265,390	8,752,677
Service-based restricted stock units	2,558,052	2,069,936	1,688,017
Performance-based restricted stock units	663,353	—	—
Convertible preferred stock	3,309	8,456	8,456
Convertible notes	3,049,980	14,585,653	—
August 2019 Bonds	—	3,799,071	—
December 2019 Bonds	1,009,450	1,009,450	—
Total	16,190,768	30,737,956	10,449,150

Leases

For its long-term operating leases, the Company recognized an operating lease right-of-use asset and an operating lease liability on its consolidated balance sheets. The lease liability is determined as the present value of future lease payments using an estimated rate of interest that the Company would pay to borrow equivalent funds on a collateralized basis at the lease commencement date. The right-of-use asset is based on the liability adjusted for any prepaid or deferred rent. The Company determines the lease term at the commencement date by considering whether renewal options and termination options are reasonably assured of exercise.

Fixed rent expense for the Company's operating leases is recognized on a straight-line basis over the term of the lease and is included in operating expenses on the consolidated statements of operations. Variable lease payments including lease operating expenses are recorded as incurred.

Stock-Based Compensation

The Company incurs stock-based compensation expense related to restricted stock units and stock options. The fair value of restricted stock is determined by the closing price of the Company's common stock reported on the Nasdaq Global Select Market on the date of grant. The Company estimates the fair value of stock options granted using the Black-Scholes option pricing model. The Black-Scholes option pricing model was developed for use in estimating the fair value of traded options, which have no vesting restrictions and are fully transferable. In addition, option valuation models require the input of subjective assumptions, including the expected stock price volatility and expected option life. The Company amortizes the fair value of the awards on a straight-line basis over the requisite vesting period of the awards. Expected volatility is based on historical volatility. The expected life of options granted is based on historical expected life. The risk-free interest rate is based on the U.S. Treasury yield in effect at the time of grant. The dividend yield is based on the fact that no dividends have been paid historically and none are currently expected to be paid in the foreseeable future. The Company recognizes forfeitures as they occur.

The weighted average assumptions used in the Black-Scholes model for option grants to employees and directors are presented below:

	Year Ended December 31,		
	2020	2019	2018
Risk-free interest rate	0.63%	2.42%	2.73%
Expected volatility	78%	70%	72%
Expected life in years	6	6	6
Dividend yield	—	—	—

The Company adopted ASU 2018-07 on January 1, 2019, which generally aligned the accounting for stock-based compensation for non-employees with that of employees. The fair value of the stock options granted to non-employees was estimated using the Black-Scholes pricing model.

The weighted average assumptions used in the Black-Scholes model for option grants to non-employees are presented below:

	Year Ended December 31,		
	2020	2019	2018
Risk-free interest rate	0.82%	2.45%	2.71%
Expected volatility	76%	88%	78%
Expected life in years	10	10	9
Dividend yield	—	—	—

Recent Accounting Pronouncements - Recently Adopted

The recent accounting pronouncements below may have a significant effect on the Company's financial statements. Recent accounting pronouncements that are not anticipated to have an impact on or are unrelated to the Company's financial condition, results of operations, or related disclosures are not discussed.

ASU No. 2019-12. In December 2019, the FASB issued ASU No. 2019-12, *Income Taxes (Topic 740) Simplifying the Accounting for Income Taxes*. FASB issued this Update as part of its simplification initiative to improve areas of GAAP and reduce cost and complexity while maintaining usefulness. The main provision that impacts the Company is the removal of the exception to the incremental approach of intra-period tax allocation when there is a loss from continuing operations and income or gain from other items (for example, discontinued operations and other comprehensive income). ASU 2019-12 is effective for annual periods, and interim periods within those annual periods, beginning after December 15, 2020. Early adoption is permitted, including adoption in an interim period. The Company has elected to early adopt ASU 2019-12. By early adopting, ASU 2019-12 became effective as of the beginning of 2020; however, there was no cumulative effect to be recognized with the early adoption. As of December 31, 2020, there was a loss from continuing operations and a cumulative loss in other comprehensive income and there was therefore no effect on the tax provision for the period ended December 31, 2020.

ASU No. 2016-13. In June 2016, the FASB issued ASU 2016-13, *Financial Instruments - Credit Losses: Measurement of Credit Losses on Financial Instruments (Topic 326)*, which amends the impairment model by requiring entities to use a forward-looking approach based on expected losses to estimate credit losses on certain types of financial instruments, including trade receivables and available for sale debt securities. This standard includes the Company's financial instruments, such as accounts receivable and investments that are generally of high credit quality. Previously, when credit losses were measured under GAAP, an entity generally only considered past events and current conditions in measuring the incurred loss. The new guidance requires the Company to identify, analyze, document and support new methodologies for quantifying expected credit loss estimates for its financial instruments, using information such as historical experience and current economic conditions, plus the use of reasonably supportable forecast information. The Company adopted ASU 2016-13 on January 1, 2020, and there was no material impact to its consolidated financial statements. The Company will continue to monitor the impact of the coronavirus, SARS-CoV-2 (“COVID-19”) outbreak on expected credit losses.

ASU No. 2018-13. In August 2018, the FASB issued ASU 2018-13, *Fair Value Measurement Disclosure Framework-Changes to the Disclosure Requirements for Fair Value Measurement*, which amends certain disclosure requirements over fair value measurements. Under the new guidance, entities will no longer be required to disclose the amount of and reasons for transfers between Level 1 and Level 2 of the fair value hierarchy, or valuation processes for Level 3 fair value measurements. However, public companies will be required to disclose the range and weighted average of significant unobservable inputs used to develop Level 3 fair value measurements, and related changes in unrealized gains and losses included in other comprehensive income. The Company adopted this guidance on January 1, 2020, and there was no material impact to its consolidated financial statement disclosures (see Note 6 for more information about the Company’s fair value classifications).

ASU No. 2018-18. In November 2018, the FASB issued ASU 2018-18, *Collaborative Arrangements (Topic 808): Clarifying the Interaction between Topic 808 and Topic 606*, which clarified the interaction between Topic 808, *Collaborative*

Arrangements, and Topic 606, *Revenue from Contracts with Customers*. The Company adopted this guidance on January 1, 2020, and there was no material impact to its consolidated financial statements.

ASU 2017-04. In January 2017, the FASB issued ASU 2017-04, *Intangibles - Goodwill and Other (Topic 350): Simplifying the Test for Goodwill Impairment* ("ASU 2017-04"). ASU 2017-04 simplifies the recognition and measurement of a goodwill impairment loss by eliminating Step 2 of the quantitative goodwill impairment test. The guidance requires a one-step impairment test in which an entity compares the fair value of a reporting unit with its carrying amount and recognizes an impairment charge for the amount by which the carrying amount exceeds the reporting unit's fair value, if any. ASU 2017-04 is effective for fiscal years beginning after December 15, 2019 and should be applied on a prospective basis. The Company adopted this guidance on January 1, 2020, and there was no material impact to its consolidated financial statements.

3. Revenue Recognition

During the year ended December 31, 2020, the Company recognized total revenue under license and other agreements of $5.0 million from Advaccine, $1.4 million from its affiliated entity Plumbline Life Sciences, Inc. ("PLS"), and $1.0 million from various other contracts. Of the total revenue recognized during the year ended December 31, 2020, $127,000 was in deferred revenue as of December 31, 2019. During the year ended December 31, 2019, the Company recognized revenue of $293,000 that was included in deferred revenue at December 31, 2018. Performance obligations are generally satisfied within 12 months of the initial contract date.

4. Collaborative Agreements

Advaccine Biopharmaceuticals Suzhou Co., Ltd. (Advaccine)

On December 31, 2020, the Company entered into a Collaboration and License Agreement (the "Agreement") with Advaccine. Under the terms of the Agreement, the Company has granted to Advaccine the exclusive right to develop, manufacture and commercialize the Company's vaccine candidate INO-4800 within the territories of China, Taiwan, Hong Kong and Macau (referred to collectively as "Greater China"). Advaccine will not have the right to grant sublicenses, other than to affiliated entities, without the Company's express prior written consent. As part of the collaboration, Advaccine has also granted to the Company a non-exclusive license to certain DNA vaccine manufacturing processes.

The Company and Advaccine have collaborated since January 2020 to leverage Advaccine's clinical development expertise to conduct an early-stage clinical trial in China in parallel with the Company's clinical development efforts in the United States and South Korea. In December 2020, the Company and Advaccine announced that they had dosed the first subject in a Phase 2 clinical trial of INO-4800 in China. This trial is independent of the Company's ongoing clinical trial of INO-4800, called INNOVATE, being conducted in the United States.

Under the Agreement, Advaccine made an upfront payment to the Company of $3.0 million subsequent to December 31, 2020. In addition to the upfront payment, the Company is entitled to receive up to an aggregate of $108.0 million upon the achievement of specified milestones related to the development, regulatory approval and commercialization of INO-4800, including the achievement of specified net sales thresholds for INO-4800 in Greater China, if approved. As of December 31, 2020 the Company had earned a $2.0 million milestone payment based on the enrollment of the first subject in the Phase 2 clinical trial for the product in the Advaccine territory. The Company will also be entitled to receive a royalty equal to a high single-digit percentage of annual net sales in each region within Greater China, subject to reduction in the event of competition from biosimilar products in a particular region and in other specified circumstances. Advaccine's obligation to pay royalties will continue, on a licensed product-by-licensed product basis and region-by-region basis, for ten years after the first commercial sale in a particular region within Greater China or, if later, until the expiration of the last-to-expire patent covering a given licensed product in a given region.

Under the Agreement, Advaccine will be responsible for the development and commercialization of the licensed products at its own cost and expense and shall use commercially reasonable efforts to develop, obtain and maintain regulatory approval of INO-4800, as well as the Company's CELLECTRA® device and arrays for use in connection with the administration of INO-4800, in each region in Greater China. In the event that the Company has not initiated the planned Phase 3 segment of its ongoing clinical trial of INO-4800 in the United States within one year after entering into the Agreement, Advaccine may elect to conduct a Phase 3 clinical trial outside of Greater China at its own cost and expense for the purposes of obtaining regulatory approval in China, subject to the Company's right to review and approve the protocols and design of such a trial.

Under the Agreement, the Company will supply Advaccine's clinical requirements of INO-4800 and devices, although Advaccine may manufacture INO-4800 for its clinical use and may procure alternate suppliers. Advaccine is responsible for the manufacture and supply of INO-4800 itself or through a contract manufacturer for commercial use. Upon Advaccine's reasonable request, the parties may negotiate a separate clinical and/or commercial supply agreement.

The Company evaluated the terms of the Advaccine Agreement under ASC Topics 606 and 808, and determined that the contract was with a customer and therefore should be accounted for under ASC Topic 606. The license to INO-4800 in the

territories was identified as the only distinct performance obligation on a standalone basis as of the inception of the agreement. The Company concluded that the license was distinct from potential future manufacturing and supply obligations. The Company further determined that the transaction price under the agreement consisted of the $3.0 million upfront payment plus the initial $2.0 million milestone payment which was achieved upon contract signing. The future potential milestone amounts were not included in the transaction price, as they were all determined to be fully constrained. As part of the evaluation of the development and regulatory milestones constraint, the Company determined that the achievement of such milestones is contingent upon success in future clinical trials and regulatory approvals, each of which is uncertain at this time. Future potential milestone amounts may be recognized as revenue under the Advaccine Agreement, as well as under other collaborative research and development arrangements, if unconstrained. Reimbursable program costs will be recognized proportionately with the performance of the underlying services or delivery of drug supply and are excluded from the transaction price.

The Agreement will continue in force on a region-by-region basis until Advaccine has no remaining royalty obligations in such region. Either party may terminate the Agreement (i) in the event the other party shall have materially breached its obligations thereunder and such default shall have continued for a specified period after written notice thereof or (ii) upon the bankruptcy or insolvency of the other party. In addition, the Company may terminate the agreement, upon prior written notice, if Advaccine (i) ceases all development or commercialization activities for at least nine months, subject to certain exceptions, or (ii) challenges the validity, enforceability or scope of any of the patents licensed by the Company to Advaccine under the Agreement, subject to certain conditions. Advaccine may terminate the Agreement at any time for convenience upon nine months' written notice to the Company, if such notice is provided before the first commercial sale of INO-4800 in Greater China, or 18 months' written notice thereafter; provided that the Company may accelerate the effectiveness of such termination to the extent permitted by law.

Under Topic 606, the entire transaction price of $5.0 million was allocated to the license performance obligation. The Company determined that as of December 31, 2020, the transfer of technology has occurred for the use and benefit of the license and accordingly, the performance obligation was fully satisfied. The Company accordingly has recognized $5.0 million in revenue under collaborative research and development arrangements on the consolidated statement of operations during the year ended December 31, 2020. As of December 31, 2020, the Company had an accounts receivable balance of $7.1 million from Advaccine.

ApolloBio Corporation

On December 29, 2017, the Company entered into an Amended and Restated License and Collaboration Agreement (the "ApolloBio Agreement"), with ApolloBio Corporation ("ApolloBio"), with an effective date of March 20, 2018. Under the terms of the ApolloBio Agreement, the Company granted to ApolloBio the exclusive right to develop and commercialize VGX-3100, its DNA immunotherapy product candidate designed to treat pre-cancers caused by HPV, within the territories of China, Hong Kong, Macao, Taiwan, and may include Korea in the event that no patent covering VGX-3100 is issued in China within the three years following the effective date of the ApolloBio Agreement.

Under the ApolloBio Agreement, the Company received proceeds of $19.4 million in March 2018, which comprised the upfront payment of $23.0 million less $2.2 million in foreign income taxes and $1.4 million in certain foreign non-income taxes. The foreign income taxes were recorded as a provision for income taxes and the foreign non-income taxes were recorded as a general and administrative expense, on the consolidated statement of operations. The Company also incurred advisory fees of $960,000 in connection with receiving the upfront payment from ApolloBio. These fees were determined to be incremental costs of obtaining the contract. The Company applied the practical expedient that permits a company to expense incremental costs to obtain a contract when the expected amortization period is one year or less and recorded the fees in general and administrative expense during the quarter ended March 31, 2018. No additional advisory fees are due related to the ApolloBio Agreement.

In addition to the upfront payment, the Company is entitled to receive up to an aggregate of $20.0 million, less required income, withholding or other taxes, upon the achievement of specified milestones related to the regulatory approval of VGX-3100 in the United States, China and Korea. In the event that VGX-3100 is approved for marketing, the Company will be entitled to receive royalty payments based on a tiered percentage of annual net sales, with such percentage being in the low- to mid-teens, subject to reduction in the event of generic competition in a particular territory. ApolloBio's obligation to pay royalties will continue for 10 years after the first commercial sale in a particular territory or, if later, until the expiration of the last-to-expire patent covering the licensed products in the specified territory.

The Company evaluated the terms of the ApolloBio Agreement under ASC Topic 606, and the license to VGX-3100 in the territories was identified as the only distinct performance obligation on a standalone basis as of the inception of the agreement. The Company concluded that the license was distinct from potential future manufacturing and supply obligations. The Company further determined that the transaction price under the agreement consisted of the $23.0 million upfront payment. The future potential milestone amounts were not included in the transaction price, as they were all determined to be fully constrained. As part of the evaluation of the development and regulatory milestones constraint, the Company determined that

the achievement of such milestones is contingent upon success in future clinical trials and regulatory approvals, each of which is uncertain at this time. Future potential milestone amounts may be recognized as revenue under the ApolloBio Agreement, as well as under other collaborative research and development arrangements, if unconstrained. Reimbursable program costs will be recognized proportionately with the performance of the underlying services or delivery of drug supply and are excluded from the transaction price. As of December 31, 2020 there have been no significant reimbursable program costs under the ApolloBio Agreement.

The ApolloBio Agreement will continue in force until ApolloBio has no remaining royalty obligations. Either party may terminate the ApolloBio Agreement in the event the other party shall materially breach or default in the performance of its material obligations thereunder and such default continues for a specified period after written notice thereof. In addition, ApolloBio may terminate the ApolloBio Agreement at any time beginning one year after the effective date for any reason upon 90 days written notice to the Company.

Under Topic 606, the entire transaction price of $23.0 million was allocated to the license performance obligation. The Company determined that during the quarter ended June 30, 2018, the transfer of technology occurred and accordingly, the performance obligation was fully satisfied. The Company has recorded the gross upfront payment received from ApolloBio of $23.0 million as license revenue on the consolidated statement of operations during the year ended December 31, 2018.

AstraZeneca

On August 7, 2015, the Company entered into a license and collaboration agreement with MedImmune, the global biologics research and development arm of AstraZeneca ("AstraZeneca"). Under the agreement, AstraZeneca acquired exclusive rights to the Company's INO-3112 immunotherapy, renamed as MEDI0457, which targets cancers caused by human papillomavirus (HPV) types 16 and 18, with the ability to sublicense those license rights. AstraZeneca made an upfront payment of $27.5 million to the Company in September 2015. AstraZeneca may be obligated to make potential future development and regulatory event-based payments to the Company totaling up to $125 million and potential future commercial event-based payments totaling up to $115 million, in each case upon the achievement of specified milestones related to MEDI0457 set forth in the license and collaboration agreement. AstraZeneca will fund all development costs associated with MEDI0457 immunotherapy. The Company is entitled to receive up to mid-single to double-digit tiered royalties on MEDI0457 product sales. Under the agreement, AstraZeneca can also request the Company to provide certain clinical manufacturing at an agreed upon price. The Company determined these options did not represent material rights at the inception of the agreement.

As of December 31, 2017, the Company had recognized all of the $27.5 million upfront payment as revenue, as all identified material performance obligations had been met with respect to that payment. In both December 2018 and March 2019, the Company recognized as revenue $2.0 million in milestone payments from AstraZeneca triggered by AstraZeneca’s initiation of the Phase 2 portion of ongoing clinical trials in the second and third major indication, respectively, under the agreement.

Coalition for Epidemic Preparedness Innovations

On April 11, 2018, the Company entered into agreements with CEPI, pursuant to which the Company intends to develop vaccine candidates against Lassa fever and MERS. The goal of the collaboration between the Company and CEPI is to conduct research and development so that investigational stockpiles will be ready for clinical efficacy trial testing during potential disease outbreaks. The agreements with CEPI contemplate preclinical studies, as well as Phase 1 and Phase 2 clinical trials, occurring over multiple years. As part of the arrangement between the parties, CEPI has agreed to fund up to an aggregate of $56 million of costs over a five-year period for preclinical studies, as well as planned Phase 1 and Phase 2 clinical trials, to be conducted by the Company and collaborators, with funding from CEPI based on the achievement of identified milestones. During the years ended December 31, 2020 and 2019, the Company received funding of $6.4 million and $6.3 million, respectively, related to these grants and recorded those payments as contra-research and development expense. As of December 31, 2020, the Company had a grant funding liability balance related to the CEPI grant of $2.6 million recorded as grant funding liability on the consolidated balance sheet related to the CEPI grant.

In January 2020, CEPI awarded the Company a grant of up to $9.0 million to develop a vaccine against COVID-19. This initial CEPI funding is intended to support preclinical and clinical development through Phase 1 human testing in the United States of INO-4800, the Company's COVID-19 vaccine candidate against COVID-19. In April 2020, CEPI awarded the Company a grant of $6.9 million to work with the International Vaccine Institute ("IVI") and the Korea National Institute of Health ("KNIH") to conduct clinical trials of INO-4800 in South Korea, a grant of $5.0 million to accelerate development of the Company's next-generation intradermal electroporation device, known as CELLECTRA® 3PSP, for the intradermal delivery of INO-4800, and a grant of $1.3 million to support large-scale manufacturing of INO-4800. During the year ended December 31, 2020, the Company received funding of $10.0 million from CEPI related to these grants for INO-4800 and recorded such amounts as contra-research and development expense. As of December 31, 2020 the Company had $3.4 million recorded as deferred grant funding on the consolidated balance sheet related to the CEPI grants related to INO-4800.

Bill & Melinda Gates Foundation

In October 2018, the Bill & Melinda Gates Foundation ("Gates") awarded and funded the Company a grant of $2.2 million to advance the development of dMAbs to address issues in infectious disease prevention and therapy. This technology has high relevance for the control of influenza and HIV. This next-generation approach to the delivery of monoclonal antibodies would make the technology accessible to low and middle-income countries. In August 2019, Gates funded an additional $1.1 million for the project. During the years ended December 31, 2020 and 2019, the Company recorded $463,000 and $2.1 million, respectively, as contra-research and development expense related to the Gates dMAb grant. As of December 31, 2020, the Company had $575,000 recorded as deferred grant funding on the consolidated balance sheet related to the grant.

In March 2020, Gates awarded and funded the Company a grant of $5.0 million to accelerate the development of the CELLECTRA® 3PSP device for the intradermal delivery of INO-4800. During the year ended December 31, 2020, the Company recorded $4.1 million as contra-research and development expense and had $884,000 recorded as deferred grant funding on the consolidated balance sheet related to this Gates grant.

Department of Defense (DoD)

In June 2020, the Company entered into an Other Transaction Authority for Prototype Agreement (the "OTA Agreement") with the DoD to fund the Company's efforts in developing the CELLECTRA® 3PSP device and associated arrays to be used for delivery of INO-4800 against COVID-19. Under the OTA Agreement, the Company intends to develop the CELLECTRA® 3PSP device and arrays for use in the U.S. military population and the U.S. population as a whole, subject to approval of the device by the U.S. Food and Drug Administration (the "FDA"). The OTA Agreement is also expected to support large-scale manufacturing of the CELLECTRA® 3PSP device, as well as large-scale DNA plasmid production for manufacture and supply of a specified number of doses of INO-4800 in support of FDA approval of the device. The total amount of funding being made available to the Company under the OTA Agreement is approximately $54.5 million. The Company has determined that the OTA Agreement should be considered under Subtopic 958-605, *Not-for-Profit Entities-Revenue Recognition*, which is outside the scope of Topic 606, as the government agency granting the Company funds is not receiving reciprocal value for their contributions. The Company will record contra-research development expense on the consolidated statement of operations in the same period that the underlying expenses are incurred.

Additionally, in June 2020, the Company was awarded a fixed-price contract (the "Procurement Contract") from the DoD for the purchase of the Company's intradermal CELLECTRA® 2000 device and accessories. The CELLECTRA® 2000 devices will be used to inject INO-4800 in the Company's planned later-stage clinical trials. The total purchase price under the Procurement Contract is approximately $16.6 million. The Company has determined that the Procurement Contract does not currently fall under the scope of ASC Topic 606 as contingencies remain regarding INO-4800 which does not give the Company the ability to satisfy its obligations under the arrangement.

During the year ended December 31, 2020, the Company recorded $21.2 million as contra-research and development expense related to these agreements with the DoD. As of December 31, 2020, the Company had an accounts receivable balance of $11.4 million on the consolidated balance sheet from the DoD.

In November 2020, the Company announced that the DoD has also agreed to provide funding for the Phase 2/3 clinical trial for INO-4800, called INNOVATE (**IN**OVIO I**NO**-4800 **Va**ccine **T**rial for **E**fficacy). These expenses will be paid directly by the DoD.

5. Short-term Investments

Short-term investments at December 31, 2020 consisted of mutual funds, certificates of deposit and U.S. agency mortgage-backed securities. Short-term investments at December 31, 2019 consisted of mutual funds. Short-term investments are recorded at fair value, based on current market valuations. Unrealized gains and losses on the Company's debt securities are excluded from earnings and reported as a separate component of other comprehensive loss until realized. Realized gains and losses and unrealized gains and losses on available-for-sale equity securities are included in non-operating other income (expense) on the consolidated statements of operations and are derived using the specific identification method for determining the cost of the securities sold. During the years ended December 31, 2020 and 2019, the Company recorded gross realized gain on investments of $744,000 and $594,000, respectively, and gross realized loss on investments of $1.3 million and $118,000, respectively. During the year ended December 31, 2020, the Company recorded net unrealized gain on available for sale equity securities of $1.7 million. There was no material unrealized gain or loss on available-for-sale equity securities recorded during the year ended December 31, 2019. No material balances were reclassified out of accumulated other comprehensive income (loss) for the years ended December 31, 2020, 2019 and 2018. Interest and dividends on investments classified as available-for-sale are included in interest income in the consolidated statements of operations. As of December 31, 2020, the Company had 12 available-for-sale securities in a gross unrealized loss position, of which none were in such position for longer than 12 months.

The following is a summary of available-for-sale securities as of December 31, 2020 and 2019:

	Contractual Maturity (in years)	As of December 31, 2020 Cost	Gross Unrealized Gains	Gross Unrealized Losses	Fair Market Value
Mutual funds	---	$ 153,177,675	$ 2,339,639	$ (644,140)	$ 154,873,174
Certificates of deposit	Less than 1	3,000,000	26,260	(10,000)	3,016,260
U.S. agency mortgage-backed securities	*	3,062,256	—	(36,755)	3,025,501
		$ 159,239,931	$ 2,365,899	$ (690,895)	$ 160,914,935

	Contractual Maturity (in years)	As of December 31, 2019 Cost	Gross Unrealized Gains	Gross Unrealized Losses	Fair Market Value
Mutual funds	---	$ 66,599,219	$ 754,709	$ (15,911)	$ 67,338,017

*No single maturity date.

The Company periodically reviews its portfolio of available-for-sale debt securities to determine if any investment is impaired due to credit loss or other potential valuation concerns. For the debt securities where the fair value of the investment is less than the amortized cost basis, the Company has assessed at the individual security level for various quantitative factors including, but not limited to, the nature of the investments, changes in credit ratings, interest rate fluctuations, industry analyst reports, and the severity of impairment. Unrealized losses on available-for-sale debt securities as of December 31, 2020 were primarily due to changes in interest rates, including credit spreads from perceived increased credit risks as a result of the COVID-19 global pandemic, and not due to increased credit risks associated with specific securities. The Company does not intend to sell these investments and it is not more likely than not that the Company will be required to sell the investments before recovery of their amortized cost bases, which may be at maturity. Based on the credit quality of the available-for-sale debt securities that are in an unrealized loss position, and the Company's estimates of future cash flows to be collected from those securities, the Company believes the unrealized losses are not credit losses. Accordingly, at December 31, 2020, the Company has not recorded an allowance for credit losses related to its available-for-sale debt securities.

6. Fair Value Measurements

The guidance regarding fair value measurements establishes a three-tier fair value hierarchy which prioritizes the inputs used in measuring fair value. These tiers include: Level 1, defined as observable inputs such as quoted prices in active markets that are accessible at the measurement date; Level 2, defined as inputs other than quoted prices in active markets that are either directly or indirectly observable; and Level 3, defined as unobservable inputs in which little or no market data exists, therefore requiring an entity to develop its own assumptions.

Assets are, and prior to September 30, 2020 liabilities were, classified based on the lowest level of input that is significant to the fair value measurements. The Company reviews the fair value hierarchy classification on a quarterly basis. Changes in the ability to observe valuation inputs may result in a reclassification of levels for certain securities within the fair value hierarchy. The Company did not have any transfer of assets and liabilities between Level 1, Level 2 and Level 3 of the fair value hierarchy during the years ended December 31, 2020 and 2019. All liabilities in the fair value hierarchy were extinguished as of September 30, 2020 as described below.

The following table presents the Company's assets that are measured at fair value on a recurring basis, and are determined using the following inputs as of December 31, 2020:

	Fair Value Measurements at December 31, 2020			
	Total	Quoted Prices in Active Markets (Level 1)	Significant Other Unobservable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
Assets:				
Cash and cash equivalents				
U.S. treasury securities	$ 59,996,800	$ 59,996,800	$ —	$ —
Short-term investments				
Mutual funds	154,873,174	154,873,174	—	—
Certificates of deposit	3,016,260	—	3,016,260	—
U.S. agency mortgage-backed securities	3,025,501	—	3,025,501	—
Total short-term investments	160,914,935	154,873,174	6,041,761	—
Investment in affiliated entity	4,460,366	4,460,366	—	—
Total assets measured at fair value	$ 225,372,101	$ 219,330,340	$ 6,041,761	$ —

The following table presents the Company's assets and liabilities that are measured at fair value on a recurring basis, and are determined using the following inputs as of December 31, 2019:

	Fair Value Measurements at December 31, 2019			
	Total	Quoted Prices in Active Markets (Level 1)	Significant Other Unobservable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
Assets:				
Cash and cash equivalents				
Money market funds	$ 2,349,729	$ 2,349,729	$ —	$ —
Short-term investments				
Mutual funds	67,338,017	67,338,017	—	—
Investments in affiliated entities	6,315,356	6,315,356	—	—
Total assets measured at fair value	$ 76,003,102	$ 76,003,102	$ —	$ —
Liabilities:				
Derivative liability	$ 8,819,023	$ —	$ —	$ 8,819,023
Total liabilities measured at fair value	$ 8,819,023	$ —	$ —	$ 8,819,023

Level 1 assets at December 31, 2020 consisted of mutual funds and U.S. treasury securities held by the Company that are valued at quoted market prices, as well as the Company's investment in its affiliated entity, PLS. Level 1 assets at December 31, 2019 consisted of money market funds and mutual funds held by the Company that are valued at quoted market prices, as well as the Company's investments in its affiliates, GeneOne and PLS. The Company accounts for its investment in 597,808 common shares of PLS as an equity investment with a fair value based on the closing price of the shares on the Korea New Exchange Market on the applicable balance sheet date. Unrealized gains and losses on the Company's equity securities are reported in the consolidated statement of operations as unrealized gain (loss) on available-for-sale equity securities or as a gain (loss) on investment in affiliated entities. In August 2020, the Company sold its investment in 1,644,155 common shares of its affiliated entity GeneOne for net proceeds of $40.1 million, resulting in a gain on investment in affiliated entity of

$36.7 million. Previously, the Company accounted for its investment in GeneOne based on the closing price of the shares on the KOSDAQ Market of the Korea Exchange (KOSDAQ) on the applicable balance sheet date.

Level 2 assets at December 31, 2020 consisted of certificates of deposit and U.S. agency mortgage-backed securities. Level 2 assets held by the Company that are initially valued at the transaction price and subsequently valued, at the end of each reporting period, typically utilizing market observable data. The Company obtains the fair value of its Level 2 assets from a professional pricing service, which may use quoted market prices for identical or comparable instruments, or inputs other than quoted prices that are observable either directly or indirectly. The professional pricing service gathers quoted market prices and observable inputs from a variety of industry data providers. The valuation techniques used to measure the fair value of the Company's Level 2 financial instruments were derived from non-binding market consensus prices that are corroborated by observable market data, quoted market prices for similar instruments, or pricing models such as discounted cash flow techniques. The Company validates the quoted market prices provided by the primary pricing service by comparing the service's assessment of the fair values of the Company's investment portfolio balance against the fair values of the Company's investment portfolio balance obtained from an independent source.

There were no Level 3 assets held as of December 31, 2020 and 2019.

There were no Level 3 liabilities held at December 31, 2020 due to the full conversion of the August 2019 Bonds into shares of the Company's common stock. Level 3 liabilities held as of December 31, 2019 consisted of the embedded conversion option contained in the August 2019 Bonds that met the criteria to be bifurcated and accounted for separately from the August 2019 Bonds (the "derivative liability") (see Note 11 below for more information). The derivative liability was recorded at fair value of $7.1 million upon the issuance of the August 2019 Bonds, and is subsequently remeasured to fair value at each reporting period. The derivative liability was initially valued and remeasured using a "with-and-without" method. The "with-and-without" methodology involves valuing the whole instrument on an as-is basis and then valuing the instrument without the embedded conversion option. The difference between the entire instrument with the embedded conversion option compared to the instrument without the embedded conversion option is the fair value of the derivative, recorded as the derivative liability. There was no derivative liability associated with the issuance of the December 2019 Bonds.

The fair value of the August 2019 Bonds with the conversion option is estimated using a Monte Carlo simulation approach. The key inputs to valuing the August 2019 Bonds with the conversion option on the date of issuance and as of August 3, 2020 conversion date included the Company’s stock price on the valuation date; the expected annual volatility of the Company’s common stock, and the discount yield, which was derived by making the fair value of the August 2019 Bonds equal to the face value on the issuance date. Fair value measurements are highly sensitive to changes in these inputs and significant changes in these inputs could result in a significantly higher or lower fair value.

The following table presents the changes in fair value of the derivative liability for the year ended December 31, 2020:

Balance at December 31, 2019	$ 8,819,023
Change in fair value	75,670,977
Derecognition of the derivative liability upon conversion	(84,490,000)
Balance at December 31, 2020	$ —

7. Major Customers and Concentration of Credit Risk

Customer	2020 Revenue	% of Total Revenue	2019 Revenue	% of Total Revenue	2018 Revenue	% of Total Revenue
ApolloBio	$ —	— %	$ —	— %	$ 23,000,000	75 %
AstraZeneca	170,587	2	3,194,877	78	6,850,424	23
Advaccine	5,000,000	68	—	—	—	—
Plumbline Life Sciences, Inc.	1,370,396	18	—	—	—	—
All other, including affiliated entities	870,237	12	917,053	22	631,473	2
Total revenue	$ 7,411,220	100 %	$ 4,111,930	100 %	$ 30,481,897	100 %

During the years ended December 31, 2020, 2019 and 2018, the Company recognized revenue from various license and other agreements. As of December 31, 2020, $11.4 million, or 62%, and $7.1 million, or 38%, of the Company's accounts receivable was attributable to the DoD and Advaccine, respectively. As of December 31, 2019, $469,000, or 67%, and $161,000, or 23%, of the Company's accounts receivable was attributable to MCDC and AstraZeneca, respectively.

There is minimal credit risk with these customers based upon collection history, their size and financial condition. Accordingly, the Company does not consider it necessary to record a reserve for uncollectible accounts receivable.

8. Prepaid Expenses and Other Current Assets

Prepaid expenses and other current assets at December 31, 2020 and 2019 consisted of the following:

	2020	2019
Prepaid manufacturing expenses (a)	$ 35,661,947	$ —
Other prepaid expenses	4,695,509	1,584,598
	$ 40,357,456	$ 1,584,598

(a) Prepaid manufacturing expenses related to deposits made to reserve capacity for the manufacturing of INO-4800 expected in 2021. In the event that the manufacturing does not occur in 2021 the deposits will be forfeited.

9. Fixed Assets

Fixed assets at December 31, 2020 and 2019 consisted of the following:

	Cost	Accumulated Depreciation and Amortization	Net Book Value
As of December 31, 2020			
Leasehold improvements	$ 15,179,447	$ (6,549,418)	$ 8,630,029
Laboratory equipment	4,788,678	(3,727,508)	1,061,170
Office furniture and fixtures	2,828,675	(2,296,942)	531,733
Computer equipment and other	4,544,915	(3,419,703)	1,125,212
	$ 27,341,715	$ (15,993,571)	$ 11,348,144
As of December 31, 2019			
Leasehold improvements	$ 15,007,935	$ (4,996,777)	$ 10,011,158
Laboratory equipment	4,102,467	(3,229,357)	873,110
Office furniture and fixtures	3,048,053	(1,944,293)	1,103,760
Computer equipment and other	3,781,020	(2,996,031)	784,989
	$ 25,939,475	$ (13,166,458)	$ 12,773,017

Depreciation expense for the years ended December 31, 2020, 2019 and 2018 was $3.0 million, $3.6 million and $3.7 million, respectively. The Company determined that the carrying value of these long-lived assets was not impaired during the periods presented. During the year ended December 31, 2020 the Company disposed of fixed assets with a net book value of $227,000 and accumulated depreciation of $200,000.

10. Goodwill and Intangible Assets

The following sets forth goodwill and intangible assets by major asset class:

	Weighted Average Useful Life (Yrs)	December 31, 2020 Gross	December 31, 2020 Accumulated Amortization	December 31, 2020 Net Book Value	December 31, 2019 Gross	December 31, 2019 Accumulated Amortization	December 31, 2019 Net Book Value
Indefinite lived:							
Goodwill(a)		$ 10,513,371	$ —	$ 10,513,371	$ 10,513,371	$ —	$ 10,513,371
Definite lived:							
Licenses	10	1,323,761	(1,276,852)	46,909	1,323,761	(1,248,104)	75,657
Bioject (b)	12	5,100,000	(2,468,889)	2,631,111	5,100,000	(2,175,556)	2,924,444
Other (c)	18	4,050,000	(3,581,250)	468,750	4,050,000	(3,356,250)	693,750
Total intangible assets	11	10,473,761	(7,326,991)	3,146,770	10,473,761	(6,779,910)	3,693,851
Total goodwill and intangible assets		$ 20,987,132	$ (7,326,991)	$ 13,660,141	$ 20,987,132	$ (6,779,910)	$ 14,207,222

(a) Goodwill was recorded from the acquisition of other companies and assets.

(b) Bioject intangible assets represent the estimated fair value of developed technology and intellectual property which were recorded from an asset acquisition.

(c) Other intangible assets represent the estimated fair value of acquired intellectual property.

Aggregate amortization expense on intangible assets was $547,000, $1.1 million and $1.2 million for the years ended December 31, 2020, 2019 and 2018, respectively. Amortization expense related to intangible assets at December 31, 2020 is expected to be incurred as follows:

Year ending December 31,	
2021	$ 521,000
2022	493,000
2023	276,000
2024	253,000
2025	253,000
Thereafter	1,351,000
	$ 3,147,000

There were no impairment or impairment indicators present and no losses were recorded during the years ended December 31, 2020, 2019 and 2018, respectively.

11. Convertible Debt

Convertible Senior Notes

On February 19, 2019 and March 1, 2019, the Company completed a private placement of $78.5 million aggregate principal amount of its 6.50% convertible senior notes due 2024 (the “Notes”). The Notes were sold in a private offering to qualified institutional buyers pursuant to Rule 144A under the Securities Act of 1933, as amended. Net proceeds from the offering were approximately $75.7 million.

The Notes are senior unsecured obligations of the Company and accrue interest payable in cash semi-annually in arrears on March 1 and September 1 of each year, beginning on September 1, 2019, at a rate of 6.50% per annum. The Notes will mature on March 1, 2024, unless earlier converted, redeemed or repurchased. Prior to the close of business on the business day immediately preceding November 1, 2023, the Notes will be convertible at the option of the holders only upon the satisfaction of certain circumstances. Thereafter, the Notes will be convertible at the option of the holders at any time until the close of business on the scheduled trading day immediately before the maturity date. Upon conversion, the Company will pay or deliver, as the case may be, cash, shares of its common stock or a combination of cash and shares of its common stock, at its election.

The initial conversion rate will be 185.8045 shares per $1,000 principal amount of Notes (equivalent to an initial conversion price of approximately $5.38 per share), subject to adjustment upon the occurrence of specified events.

The Company may not redeem the Notes prior to March 1, 2022. On or after March 1, 2022, the Company may redeem all, or any portion, of the Notes for cash if the last reported sale price per share of the Company's common stock exceeds 130% of the conversion price on (i) each of at least 20 trading days (whether or not consecutive) during the 30 consecutive trading days ending on, and including, the trading day immediately before the Company sends the related redemption notice; and (ii) the trading day immediately before the date the Company sends such redemption notice. The redemption price will be equal to 100% of the principal amount of the Notes to be redeemed, plus accrued and unpaid interest to, but excluding, the redemption date.

The Company evaluated the accounting for the issuance of the Notes and concluded that the embedded conversion features meet the requirements for a derivative scope exception for instruments that are both indexed to an entity’s own stock and classified in stockholders’ equity in its consolidated balance sheet, and that the cash conversion guidance applies. Therefore, the Notes issuance proceeds of $78.5 million are allocated first to the liability component based on the fair value of non-convertible debt with otherwise identical residual terms with the residual proceeds allocated to equity for the conversion features. The Company determined that the fair value of the non-convertible debt upon issuance of the Notes was $62.2 million and recorded this amount as a liability and the offsetting amount as a debt discount as a reduction to the carrying value of the Notes on the closing date. The debt issuance costs associated with the Notes of $2.8 million are allocated to the liability and equity component in the same proportion as the issuance proceeds.

The Company determined that all other features of the Notes were clearly and closely associated with a debt host and did not require bifurcation as a derivative liability, or the fair value of the feature was immaterial to the Company's consolidated financial statements.

The Company determined that the expected life of the Notes was equal to the period through November 1, 2023 as this represents the point at which the Notes are initially subject to repurchase by the Company at the option of the holders. Accordingly, the total debt discount of $18.6 million, inclusive of the fair value of the embedded conversion feature derivative at issuance, is being amortized using the effective interest method through November 1, 2023. The effective interest rate of the liability component is 13.1%.

During the year ended December 31, 2020, the Company received notices for the conversion of $62.1 million of principal amount of the Notes, which were settled into an aggregate of 11,535,660 shares of the Company's common stock. The fair value of the Notes at the date of conversion was $43.7 million compared to the carrying value of $52.5 million, resulting in a $8.8 million gain on extinguishment of debt. This gain was recorded in the consolidated statement of operations. To measure the fair value of the converted Notes as of the conversion dates, the Company engaged a third-party valuation expert and utilized a binomial lattice model.

The balance of the Notes at December 31, 2020 is as follows:

Principal amount	$	78,500,000
Principal amount converted into common shares		(62,085,000)
Unamortized debt discount on the liability component		(2,312,404)
Unamortized debt issuance cost		(318,266)
Accrued interest		355,658
Net carrying amount	$	14,139,988

For the years ended December 31, 2020 and 2019, the Company recognized $6.9 million and $7.0 million, respectively, of interest expense related to the Notes, of which $4.1 million and $4.4 million, respectively, related to the contractual interest coupon.

August 2019 Convertible Bonds

On August 1, 2019, the Company closed a private placement of the August 2019 Bonds with an aggregate principal amount of 18 billion KRW (approximately USD $15.0 million based on the exchange rate on the date of issuance) issued to institutional investors led by Korea Investment Partners (KIP), a global venture capital and private equity firm based in Seoul, Korea. Net proceeds from the offering were approximately $14.5 million.

The August 2019 Bonds, which are unsecured obligations of the Company, were issued on August 1, 2019 and accrued interest at a coupon rate of 1.00% per annum, payable quarterly. The August 2019 Bonds were scheduled to mature on July 31, 2024, unless earlier converted or repurchased. On August 3, 2020 the August 2019 Bonds were converted in full into an aggregate of 4,962,364 shares of the Company's common stock, leaving no further August 2019 Bonds outstanding. The initial

conversion rate was 211.0595 shares per KRW1,000,000 in principal amount (equivalent to an initial conversion price of approximately USD $4.00 per share based on the exchange rate as of July 30, 2019), subject to adjustment upon the occurrence of specified events. The conversion rate was reset on January 2, 2020 and was subject to reset quarterly thereafter if the current market price was lower than the conversion price then in effect. The conversion rate as of the date of conversion on August 1, 2020 was 275.6873 shares per KRW1,000,000 in principal amount (equivalent to a conversion price of approximately USD $3.14 per share).

The Company evaluated the accounting for the issuance of the August 2019 Bonds and concluded that the embedded conversion feature was considered a derivative requiring bifurcation from the August 2019 Bonds as it did not meet the equity scope exception due to the fact that it was denominated in a currency other than the Company's functional currency. The fair value of the conversion feature at August 1, 2019 was $7.1 million, which was recorded as a reduction to the carrying value of the debt. This debt discount was being amortized to interest expense over the term of the debt using the effective interest method. The conversion option was accounted for as a derivative liability, which was revalued each reporting period with the resulting change in fair value reflected in other income (expense), net, in the consolidated statements of operations.

The Company determined that all other features of the August 2019 Bonds were clearly and closely associated with a debt host and did not require bifurcation as a derivative liability, or the fair value of the feature was immaterial to the Company's consolidated financial statements.

At their issuance, the Company determined that the expected life of the August 2019 Bonds was equal to the period through August 1, 2022 as this represented the point at which the August 2019 Bonds were initially subject to repurchase by the Company at the option of the holders. Accordingly, the total debt discount of $7.3 million, inclusive of the fair value of the embedded conversion feature derivative at issuance, was being amortized using the effective interest method through August 1, 2022. For the years ended December 31, 2020 and 2019, the Company recognized $1.6 million and $982,000, respectively, of interest expense related to the August 2019 Bonds, of which $87,000 and $65,000, respectively, related to the contractual interest coupon.

In August 2020, all outstanding August 2019 Bonds were converted into common stock. Immediately prior to the conversion, the derivative liability was revalued at $84.5 million. The change in fair value of the derivative liability was an increase of $75.7 million, which was recorded on the consolidated statement of operations. To measure the fair value of the derivative liability as of the conversion date, the Company engaged a third-party valuation expert.

Upon conversion, a loss on extinguishment of $8.2 million was recorded on the consolidated statement of operations. This loss represents the difference between (a) the calculated fair value of the derivative liability immediately prior to its derecognition plus the carrying amount of the debt component including any unamortized debt discount and issuance costs and (b) the fair value of the 4,692,364 shares of the Company's common stock issued upon conversion.

December 2019 Convertible Bonds

On December 26, 2019, the Company closed a private placement of convertible promissory notes (the “December 2019 Bonds”) with an aggregate principal amount of 4.7 billion KRW (approximately USD $4.1 million based on the exchange rate on the date of issuance) issued to a Korea-based institutional investor. Net proceeds from the offering were approximately $4.0 million.

The December 2019 Bonds, which are unsecured obligations of the Company, were issued on December 31, 2019 and will accrue interest at a coupon rate of 1.00% per annum, payable quarterly. The December 2019 Bonds will mature on December 31, 2024, unless earlier converted or repurchased. The outstanding December 2019 Bonds will be repaid at maturity at a price equal to the principal of the outstanding bonds to be repaid plus a premium on such bonds to provide an internal rate of return with respect to such bonds of 6.00%. Commencing on December 31, 2020, the December 2019 Bonds are convertible until the date that is one month prior to maturity date. Upon conversion, the Company will deliver shares of common stock of the Company. The initial conversion rate was 214.7766 shares per KRW1,000,000 principal amount of Bonds (equivalent to an initial conversion price of approximately USD $4.00 per share based on the exchange rate as of December 19, 2019), subject to adjustment upon the occurrence of certain events. The conversion rate was subject to reset on July 2, 2020 and on each three month anniversary thereafter until the maturity date to the then current market price if the current market price is lower than the conversion price then in effect; provided that the conversion rate will not exceed 357.9611 shares per KRW1,000,000 (equivalent to a conversion price of approximately USD $2.40 per share based on the exchange rate as of December 19, 2019). The conversion rate has not been reset as of December 31, 2020 from the initial conversion rate.

The December 2019 Bonds will be subject to repurchase by the Company at the option of the bondholders from and including December 31, 2022 up to the date that is one month prior to the maturity date at a repurchase price equal to the principal of the December 2019 Bonds to be repurchased plus a premium on the Bonds in order to ensure an internal rate of return with respect to the Bonds equal to 6.00%. In addition, upon the occurrence of a fundamental change (as defined in the Subscription Agreement) the Company will be required to offer to repurchase the Bonds at a repurchase price equal to the principal amount thereof plus accrued and unpaid interest thereon to but excluding the applicable repurchase date. If certain

bankruptcy and insolvency-related events of default occur, the principal of, and accrued and unpaid interest on, all of the then outstanding December 2019 Bonds shall automatically become due and payable. If any other event of default occurs and is continuing, the holders of at least 25% of the in aggregate principal amount of the December 2019 Bonds by notice to the Company may declare the principal of, and accrued and unpaid interest on, all of the then-outstanding December 2019 Bonds to be due and payable.

The Company evaluated the accounting for the issuance of the December 2019 Bonds and concluded that the embedded conversion feature does not require bifurcation from the December 2019 Bonds. Although the embedded conversion feature meets the definition of a derivative, it qualifies for the equity scope exception for instruments that are both indexed to an entity's own stock and classified in stockholders' equity in its consolidated balance sheet. The December 2019 Bonds are denominated in a foreign currency other than the Company's functional currency, which would typically violate the settlement provision criteria when analyzing whether the conversion option is indexed to an entity's own stock. However, per the terms of the agreement, the functional currency rate required to be used in a conversion scenario is fixed as of the date preceding the date of issuance of the Bonds. Therefore, the fluctuation in functional currency does not impact the settlement of the conversion option. Further, as there is no cash conversion feature or beneficial conversion feature on the date of issuance, and the Bonds were not issued at a substantial premium, all of the proceeds were recorded as a liability.

The Company determined that all other features of the December 2019 Bonds were clearly and closely associated with a debt host and did not require bifurcation as a derivative liability, or the fair value of the feature was immaterial to the Company's consolidated financial statements.

The balance of the December 2019 Bonds at December 31, 2020 is as follows:

Principal amount	$	4,327,370
Unamortized debt issuance cost		(36,525)
Accretion of premium associated with the December 2019 Bonds		214,171
Accrued interest		10,818
Net carrying amount	$	4,515,834

The Company determined that the expected life of the December 2019 Bonds was equal to the period through December 31, 2022 as this represents the point at which the December 2019 Bonds are initially subject to repurchase by the Company at the option of the holders. The effective interest rate of the December 2019 Bonds is 6.2%. For the year ended December 31, 2020, the Company recognized $253,000 of interest expense related to the December 2019 Bonds, of which $40,000 related to the contractual interest coupon. As of December 31, 2020, there have not been any conversions or redemptions of the December 2019 Bonds.

As of December 31, 2020, future minimum payments due under the Company's convertible debt instruments are as follows:

Year ending December 31,	Convertible Notes (1)	December 2019 Bonds (2)	Total
2021	$ 1,067,000	$ 43,000	$ 1,110,000
2022	1,067,000	43,000	1,110,000
2023	1,067,000	44,000	1,111,000
2024	16,948,000	5,571,000	22,519,000
Total	$ 20,149,000	$ 5,701,000	$ 25,850,000

(1) Amounts represent contractual amounts due under the Notes, including interest based on the fixed rate of 6.5% per year.

(2) Amounts represent amounts due under the December 2019 Bonds, including interest based on the fixed rate of 1% per year plus a premium on such bonds to provide an internal rate of return with respect to such Bonds of 6% at maturity.

12. Accounts Payable and Accrued Expenses

Accounts payable and accrued expenses at December 31, 2020 and 2019 consisted of the following:

	2020	2019
Trade accounts payable	$ 825,516	$ 6,919,081
Accrued compensation	13,127,257	8,967,897
Accrued subcontract costs	247,796	273,508
Other accrued expenses	7,003,239	2,076,772
	$ 21,203,808	$ 18,237,258

13. Stockholders' Equity

Preferred Stock

			Shares Outstanding as of December 31,	
	Shares Authorized	Shares Issued	2020	2019
Series C Preferred Stock, par $0.001	1,091	1,091	9	23

In June 2020, 14 shares of the Company's Series C preferred stock were converted into an aggregate of 5,147 shares of the Company's common stock.

The holder of any share or shares of Series C Preferred Stock has the right at any time, at such holder's option, to convert all or any lesser portion of such holder's shares of the Preferred Stock into fully paid and non-assessable shares of Common Stock. As of December 31, 2020, the Conversion Value was $27.20 per share, such that the outstanding shares of Series C Preferred Stock were convertible into an aggregate of 3,309 shares of common stock.

Common Stock

In May 2018, the Company entered into the Sales Agreement with an outside placement agent (the "Placement Agent") to sell shares of its common stock with aggregate gross proceeds of up to $100.0 million, from time to time, through an "at-the-market" equity offering program under which the Placement Agent will act as sales agent. During the first quarter of 2020, the Company and the Placement Agent entered into a first and second amendment to the Sales Agreement (the "Prior Sales Agreement") to increase the amount of common stock that may be sold under the Sales Agreement from $100.0 million to $250.0 million. As of March 31, 2020, there was no remaining capacity under the Prior Sales Agreement. On April 3, 2020, the Company and the Placement Agent entered into a new Sales Agreement (the "New Sales Agreement") to sell shares of its common stock. On April 3, 2020 and May 12, 2020, the Company filed prospectus supplements pursuant to the New Sales Agreement for the offer and sale of its Common Stock for aggregate gross proceeds of up to an aggregate of $250.0 million. Under the New Sales Agreement, the Company will set the parameters for the sale of shares, including the number of shares to be issued, the time period during which sales are requested to be made, limitation on the number of shares that may be sold in any one trading day and any minimum price below which sales may not be made. The New Sales Agreement provides that the Placement Agent will be entitled to compensation for its services in an amount equal to up to 3.0% of the gross proceeds from the sales of shares sold through the Placement Agent under the New Sales Agreement. The Company has no obligation to sell any shares under the New Sales Agreement, and could at any time suspend solicitation and offers under the New Sales Agreement.

During the three months ended March 31, 2020, the Company sold 43,148,952 shares of its common stock under the Prior Sales Agreement. The sales were made at a weighted average price of $4.92 per share, resulting in aggregate net proceeds of $208.2 million. As of March 31, 2020, there was no remaining capacity under the Prior Sales Agreement.

During the year ended December 31, 2020, the Company sold a total of 22,915,934 shares of common stock under the New Sales Agreement. The sales were made at a weighted average price of $10.91 per share resulting in aggregate net proceeds of $246.2 million. As of December 31, 2020, there was no remaining capacity under the New Sales Agreement.

Stock Options and Restricted Stock Units

The Company has a stock-based incentive plan, the 2016 Omnibus Incentive Plan (as amended to date, the "2016 Incentive Plan"), pursuant to which the Company may grant stock options, restricted stock awards, restricted stock units and other stock-based awards or short-term cash incentive awards to employees, directors and consultants.

The 2016 Incentive Plan was originally approved by the Company's stockholders on May 13, 2016, and an amendment to the plan to increase the number of shares available for issuance was approved by the stockholders on May 8, 2019. The maximum number of shares of the Company's common stock available for issuance over the term of the 2016 Incentive Plan

may not exceed 18,000,000 shares, provided that commencing with the first business day of each calendar year beginning January 1, 2020, such maximum number of shares shall be increased by 2,000,000 shares of common stock unless the Board determines, prior to January 1 for any such calendar year, to increase such maximum amount by a fewer number of shares or not to increase the maximum amount at all for such year. On January 1, 2021, the maximum number of shares to be issued increased by 2,000,000. At December 31, 2020, there were 18,000,000 shares of common stock reserved for issuance upon exercise of incentive awards granted and to be granted at future dates under the 2016 Incentive Plan. At December 31, 2020, the Company had 6,739,577 shares of common stock available for future grant under the 2016 Incentive Plan, 2,558,052 shares underlying outstanding but unvested restricted stock units and options outstanding to purchase 5,742,109 shares of common stock under the 2016 Incentive Plan. The awards granted and available for future grant under the 2016 Incentive Plan generally vest over three years and have a maximum contractual term of ten years. The 2016 Incentive Plan terminates by its terms on March 9, 2026.

The Amended and Restated 2007 Omnibus Incentive Plan (the "2007 Incentive Plan") was adopted on March 31, 2007 and terminated by its terms on March 31, 2017. At December 31, 2020, the Company had options outstanding to purchase 3,164,515 shares of common stock under the 2007 Incentive Plan. The awards granted under the 2007 Incentive Plan generally vest over three years and have a maximum contractual term of ten years.

Total employee and director stock-based compensation expense recognized in the consolidated statements of operations for the years ended December 31, 2020, 2019 and 2018 was $14.5 million, $9.8 million and $10.2 million, respectively, of which $8.0 million, $5.9 million and $5.9 million was included in research and development expenses and $6.5 million, $3.9 million and $4.3 million was included in general and administrative expenses, respectively.

At December 31, 2020 and 2019, there was $4.4 million and $3.4 million, respectively, of total unrecognized compensation expense related to unvested stock options, which is expected to be recognized over a weighted-average period of 1.4 years and 1.7 years, respectively.

At December 31, 2020 and 2019, there was $10.9 million and $4.3 million, respectively, of total unrecognized compensation expense related to unvested restricted stock units, which is expected to be recognized over a weighted-average period of 1.9 years and 1.6 years, respectively.

The fair value of stock options granted to non-employees was estimated using the Black-Scholes pricing model. Total stock-based compensation expense for stock options and restricted stock units granted to non-employees for the years ended December 31, 2020, 2019 and 2018 was $1.2 million, $970,000 and $302,000, respectively. As of December 31, 2020, options to purchase 845,375 shares of common stock granted to non-employees remained outstanding.

The following table summarizes total stock options outstanding at December 31, 2020:

	Options Outstanding			Options Exercisable	
Exercise Price	Shares Underlying Options Outstanding	Weighted-Average Remaining Contractual Life (in Years)	Weighted Average Exercise Price	Shares Underlying Options Exercisable	Weighted Average Exercise Price
$1.48-$3.00	452,749	2.5	$ 2.24	428,231	$ 2.23
$3.01-$6.00	3,261,410	7.4	$ 3.85	1,975,426	$ 3.98
$6.01-$9.00	3,879,209	6.5	$ 7.59	2,864,794	$ 7.33
$9.01-$12.00	365,223	7.2	$ 10.42	233,282	$ 10.08
$12.01-$15.00	833,282	5.9	$ 13.46	546,723	$ 13.14
$15.01-$25.62	114,751	9.6	$ 20.57	31,041	$ 20.59
	8,906,624	6.6	$ 6.78	6,079,497	$ 6.58

At December 31, 2020, the aggregate intrinsic value of options outstanding was $24.2 million, the aggregate intrinsic value of options exercisable was $16.8 million, and the weighted average remaining contractual term of options exercisable was 5.7 years.

At December 31, 2020, the aggregate intrinsic value of unvested restricted stock units was $22.6 million and the aggregate intrinsic value of restricted stock units which vested during the year ended December 31, 2020 was $13.5 million.

At December 31, 2020, options to purchase 8,906,624 shares of common stock and 2,558,052 restricted stock units were expected to vest.

Stock option activity under the Company's equity incentive plans during the year ended December 31, 2020 was as follows:

	Number of Shares	Weighted-Average Exercise Price
Balance, December 31, 2019	9,265,390	$ 5.72
Granted	2,126,182	10.17
Exercised	(2,178,252)	5.63
Cancelled	(306,696)	6.40
Balance, December 31, 2020	8,906,624	$ 6.78

Restricted stock unit activity under the Company's equity incentive plans during the year ended December 31, 2020 was as follows:

	Number of Shares
Balance, December 31, 2019	2,069,936
Granted	1,586,280
Vested	(1,040,628)
Cancelled	(57,536)
Balance, December 31, 2020	2,558,052

The weighted average exercise price per share was $4.44 for the 78,750 options which expired during the year ended December 31, 2020, $6.27 for the 324,502 options which expired during the year ended December 31, 2019 and $5.17 for the 119,091 options which expired during the year ended December 31, 2018.

The weighted average grant date fair value per share was $6.87, $2.19 and $2.86 for options granted during the years ended December 31, 2020, 2019 and 2018, respectively.

The weighted average grant date fair value was $9.12, $3.09 and $4.31 per share for restricted stock units granted during the years ended December 31, 2020, 2019 and 2018, respectively.

The Company received $12.3 million, $113,000 and $1.5 million in proceeds from the exercise of stock options during the years ended December 31, 2020, 2019 and 2018, respectively. The aggregate intrinsic value of options exercised was $14.2 million, $25,000 and $910,000 during the years ended December 31, 2020, 2019 and 2018, respectively.

On August 28, 2020, the Company granted 663,353 performance-based RSUs to key employees under the 2016 Incentive Plan. The RSUs will vest in two tranches as follows: 50% of the shares in each tranche will vest upon achievement of the predetermined performance milestones and the remaining 50% of the shares in each tranche will vest upon subsequent completion of a one-year service period. The grant date fair value of the performance-based RSUs was $8.0 million based on the grant date closing price per share of $12.06. As of December 31, 2020, the underlying performance milestones of the RSUs were not probable of achievement, and no stock-based compensation expense was recognized for the performance-based RSUs for the year then ended.

14. Leases

The Company leases approximately 82,200 square feet of office, laboratory, and manufacturing space in San Diego, California and 57,360 square feet of office space in Plymouth Meeting, Pennsylvania under various non-cancellable operating lease agreements with remaining lease terms of 2.9 years to 9.0 years, which represent the non-cancellable periods of the leases. The Company has excluded the extension options from its lease terms in the calculation of future lease payments as they are not reasonably certain to be exercised. The Company's lease payments consist primarily of fixed rental payments for the right to use the underlying leased assets over the lease terms as well as payments for common area maintenance and administrative services. The Company has received customary incentives from its landlords, such as reimbursements for tenant improvements and rent abatement periods, which effectively reduce the total lease payments owed for these leases.

The Company performed an evaluation of its contracts with customers and suppliers in accordance with ASC Topic 842 and determined that, except for the real estate leases described above and various copier leases, none of its other contracts contain a right-of-use asset.

Operating lease right-of-use assets and liabilities on the consolidated balance sheet represents the present value of the remaining lease payments over the remaining lease terms. Payments for additional monthly fees to cover the Company's share

of certain facility expenses are not included in operating lease right-of-use assets and liabilities. The Company uses its incremental borrowing rate to calculate the present value of its lease payments, as the implicit rates in the leases are not readily determinable.

As of December 31, 2020, the maturities of the Company's operating lease liabilities were as follows:

Year ending December 31,	
2021	$ 3,968,000
2022	4,045,000
2023	4,023,000
2024	3,001,000
2025	3,063,000
Thereafter	9,888,000
Total remaining lease payments	27,988,000
Less: present value adjustment	(7,595,000)
Total operating lease liabilities	20,393,000
Less: current portion	(2,329,000)
Long-term operating lease liabilities	$ 18,064,000
Weighted-average remaining lease term	7.4 years
Weighted-average discount rate	8.5 %

Lease costs included in operating expenses in the consolidated statements of operations for the years ended December 31, 2020, 2019 and 2018 were $3.4 million, $3.2 million and $3.4 million, respectively. Operating lease costs consisting of the fixed lease payments included in operating lease liabilities are recorded on a straight-line basis over the lease terms. Variable lease costs are recorded as incurred.

In the fourth quarter of 2019, the Company entered into two agreements to sublease a total of approximately 13,500 square feet in its Plymouth Meeting headquarters through periods between December 31, 2022 and March 31, 2025.

In the normal course of business, the Company is a party to a variety of agreements pursuant to which it may be obligated to indemnify the other party. It is not possible to predict the maximum potential amount of future payments under these types of agreements due to the conditional nature of the Company's obligations and the unique facts and circumstances involved in each particular agreement. Historically, payments made by the Company under these types of agreements have not had a material effect on its business, consolidated results of operations or financial condition.

15. Investment in Affiliated Entity

As of December 31, 2020 and 2019, the Company held 597,808 and 395,758 common shares in PLS, representing a 19.7% and 15.0% ownership interest, respectively. On August 27, 2020, the Company sold 1,644,155 shares of common stock in GeneOne for net proceeds of approximately 47.4 billion KRW (approximately USD $40.1 million based on the exchange rate on the date of sale). The Company no longer holds an investment in GeneOne shares and GeneOne is no longer considered a related party to the Company under ASC Topic 850. Please see further information as discussed in Note 2 and Note 6.

16. Income Taxes

In accordance with the guidance pursuant to accounting for income taxes, a deferred tax asset or liability is determined based on the difference between the financial statement and tax basis of assets and liabilities as measured by the enacted tax rates which will be in effect when these differences reverse. The Company provides a valuation allowance against net deferred tax assets unless, based upon the available evidence, it is more likely than not that the deferred tax asset will be realized.

The components of pretax loss from operations are as follows:

	Year Ended December 31,		
	2020	**2019**	**2018**
U.S. Domestic	$ (162,664,355)	$ (120,809,112)	$ (94,798,019)
Foreign	(225,949)	—	—
Pretax loss from operations	$ (162,890,304)	$ (120,809,112)	$ (94,798,019)

The components of the provision for (benefit from) income taxes are presented in the following table:

	Year Ended December 31,		
	2020	2019	2018
Current:			
Federal	$ —	$ 4,000	$ —
State	—	2,000	—
Foreign	—	—	2,170,000
	—	6,000	2,170,000
Deferred:			
Federal	—	(263,000)	
State	—	—	—
Foreign	—	—	—
	—	(263,000)	—
	$ —	$ (257,000)	$ 2,170,000

The reconciliation of income taxes attributable to continuing operations computed at the statutory tax rates to income tax expense (benefit), using a 21% statutory tax rate for December 31, 2020, 2019 and 2018, is as follows:

	Year Ended December 31,		
	2020	2019	2018
Income (benefit) taxes at statutory rates	$ (34,207,000)	$ (25,370,000)	$ (19,908,000)
State income tax, net of federal benefit	—	—	(4,000)
Foreign income taxes	—	—	2,170,000
Change in valuation allowance	21,428,000	25,457,000	20,898,000
Nondeductible loss on extinguishment of debt	14,450,000	—	—
Research and development tax credits	(2,650,000)	(3,838,000)	(3,170,000)
Change in fair value of warrants	—	—	(76,000)
Stock-based compensation	(1,953,000)	1,114,000	1,094,000
Uncertain tax positions	1,068,000	1,537,000	1,268,000
Deconsolidation of subsidiary	853,000	—	—
Expired NOLs and credits	468,000	616,000	2,176,000
Limited NOLs and credits	(368,000)	(616,000)	(2,176,000)
Change in tax rates	—	12,000	—
Foreign tax rate differential	(9,000)	—	—
Other	920,000	831,000	(102,000)
	$ —	$ (257,000)	$ 2,170,000

The income tax benefit recorded during the year ended December 31, 2019 of $257,000 was principally due to a requirement under ASC Topic 740, *Accounting for Income Taxes*, that a company must consider all sources of income in order to determine the tax benefit resulting from a loss from continuing operations. As a result of the requirement under ASC 740-20-45-7, the pretax income which the Company generated from other comprehensive income was a source of income which resulted in the partial realization of the current year loss from continuing operations.

Adoption of ASU 2019-12

The Company early adopted ASU No. 2019-12 as of January 1, 2020. Among other provisions, ASU 2019-12 eliminated the requirement under ASC 740-20-45-7 to consider all sources of income in order to determine the tax benefit resulting from a loss from continuing operations.

Significant components of the Company's deferred tax assets and liabilities as of December 31, 2020 and 2019 are shown below:

	As of December 31,	
	2020	2019
Deferred tax assets:		
Capitalized research expense	$ 5,250,000	$ 6,300,000
NOL carryforwards	127,835,000	110,788,000
Research and development and other tax credits	13,242,000	11,737,000
Deferred revenue	1,628,000	1,506,000
Stock-based compensation	3,256,000	3,255,000
Acquired intangibles	757,000	889,000
Derivative liability	—	1,852,000
Interest expense	564,000	1,122,000
Investment in affiliated entity	542,000	645,000
Lease liability	4,283,000	4,722,000
Other	6,127,000	2,413,000
	163,484,000	145,229,000
Valuation allowance	(159,705,000)	(137,159,000)
Total deferred tax assets	3,779,000	8,070,000
Deferred tax liabilities:		
Acquired intangibles	(179,000)	(160,000)
Right of use asset	(2,676,000)	(2,894,000)
Note discount	(469,000)	(2,862,000)
Convertible note	—	(1,381,000)
Fixed assets	(487,000)	(805,000)
Net deferred tax liabilities	$ (32,000)	$ (32,000)

As of December 31, 2020, the Company had federal, California and Pennsylvania tax net operating loss (NOL) carryforwards of $566.2 million, $68.6 million and $75.3 million, respectively, net of the net operating losses that will expire due to IRC Section 382 limitations. The aggregate federal net operating losses generated in 2018 and after for the amount of $270.3 million will carryforward indefinitely and be available to offset up to 80% of future taxable income each year, subject to certain modifications made by the Coronavirus Aid, Relief, and Economic Security Act (CARES Act) enacted in 2020. The federal NOL carryforward began to expire in 2021, and the California and Pennsylvania NOL carryforwards will begin and have begun to expire in 2028 and 2020, respectively, unless previously utilized.

In addition, as of December 31, 2020, the Company had federal and state research and development (R&D) tax credit carryforwards of $19.8 million and $3.2 million, respectively. The federal tax credit carryforwards will begin to expire in 2029. The California research tax credits do not expire.

Based upon statute, federal and state losses and credits are expected to expire as follows (in millions):

Expiration Date:	Federal NOLs	State NOLs	Federal R&D	State R&D
2021	$ 2.3	$ 0.3	$ —	$ —
2022	6.1	0.4	—	—
2023	5.3	1.2	—	—
2024	14.5	9.1	—	—
2025 and thereafter	267.7	132.9	19.8	—
Indefinite	270.3	—	—	3.2
	$ 566.2	$ 143.9	$ 19.8	$ 3.2

Pursuant to Internal Revenue Code (IRC) Sections 382 and 383, annual use of the Company's NOL and R&D credit carryforwards may be limited in the event that a cumulative change in ownership of more than 50% occurs within a three-year period. The Company has completed an IRC Section 382/383 analysis regarding the limitation of NOL and R&D credit

carryforwards as of December 31, 2020. As a result of the analysis, the Company estimates that approximately $10.2 million of tax benefits related to NOL and R&D carryforwards will expire unused. Accordingly, the related NOL and R&D credit carryforwards have been removed from deferred tax assets, accompanied by a corresponding reduction of the valuation allowance. Due to the existence of the valuation allowance, limitations created by current and future ownership changes, if any, related to the Company's operations in the United States will not impact its effective tax rate. Any additional ownership changes may further limit the ability to use the NOL and R&D carryforwards.

The Tax Cuts and Jobs Act of 2017 subjects a U.S. stockholder to tax on Global Intangible Low-Taxed Income (GILTI) earned by certain foreign subsidiaries. The FASB Staff Q&A, Topic 740, No. 5, Accounting for Global Intangible Low-Taxed Income, states that an entity can make an accounting policy election to recognize deferred taxes for temporary basis differences expected to reverse as GILTI in future years or to provide for the tax expense related to GILTI in the year the tax is incurred as a period expense only. The Company has elected to provide for the tax expense related to GILTI in the year the tax is incurred as a period expense only. For 2020, the Company did not generate any GILTI due to losses earned by its foreign subsidiary.

On March 27, 2020, the CARES Act was enacted in response to the COVID-19 pandemic. The CARES Act, among other things, permits federal NOL carryovers and carrybacks to offset 100% of taxable income for taxable years beginning before 2021. In addition, the CARES Act allows federal NOLs incurred in 2018, 2019, and 2020 to be carried back to each of the five preceding taxable years to generate a refund of previously paid income taxes. Due to the Company's history of net operating losses, the CARES Act is not expected to have a material impact on the Company's financial statements.

The following table summarizes the activity related to the Company's unrecognized tax benefits:

	Year ended December 31,		
	2020	2019	2018
Balance at beginning of the year	$ 11,204,000	$ 9,632,000	$ 8,313,000
Increases related to current year tax positions	1,043,000	1,575,000	1,319,000
Increases (decreases) related to prior year tax positions	27,000	(3,000)	—
Other	(64,000)	—	—
Balance at end of the year	$ 12,210,000	$ 11,204,000	$ 9,632,000

The amount of unrecognized tax benefits that, if recognized and realized, would affect the effective tax rate was $10.9 million, $9.9 million and $8.3 million as of December 31, 2020, 2019 and 2018, respectively, subject to valuation allowances. The Company has not recorded any interest and penalties on the unrecognized tax positions as the Company has continued to generate net operating losses after accounting for the unrecognized tax benefits. The Company does not anticipate that the total amount of unrecognized tax benefits will significantly increase or decrease within twelve months of the reporting date.

The Company and its subsidiaries are subject to U.S. federal income tax as well as income tax in multiple state jurisdictions. With few exceptions, the Company is no longer subject to United States federal income tax examinations for years before 2017 and state and local income tax examinations before 2016. However, to the extent allowed by law, the tax authorities may have the right to examine prior periods where net operating losses were generated and carried forward, and make adjustments up to the amount of the NOL carryforward amount. The Company is not currently under Internal Revenue Service (“IRS”), state or local tax examination.

17. 401(k) Plan

The Company has adopted a 401(k) Profit Sharing Plan covering substantially all of its employees. The defined contribution plan allows the employees to contribute a percentage of their compensation each year. The Company currently matches 50% of its employees’ contributions, up to 6% of their annual compensation. The Company’s contributions are recorded as expense in the accompanying consolidated statements of operations and totaled $1.1 million, $1.2 million and $1.2 million for the years ended December 31, 2020, 2019 and 2018, respectively.

18. Related Party Transactions

GeneOne Life Sciences

On August 27, 2020, the Company sold 1,644,155 shares of common stock in GeneOne for net proceeds of approximately 47.4 billion KRW (approximately USD $40.1 million based on the exchange rate on the date of sale). The Company no longer holds an investment in GeneOne shares and GeneOne is no longer considered a related party to the Company under ASC 850. The Company's consolidated balance sheet as of December 31, 2020 no longer reflects GeneOne’s portion in accounts receivable and accounts payable and accrued expenses with affiliated entities, whereas the Company’s balance sheet as of December 31, 2019 reflects $128,000 and $511,000 in accounts receivable and accounts payable and accrued expenses with

affiliated entities, respectively, related to GeneOne. Revenues recognized from GeneOne will no longer be presented as revenue with affiliated entity on the consolidated statement of operations after the change in related party designation in August 2020.

Revenue recognized from GeneOne for the years ended December 31, 2020, 2019 and 2018 consisting of patent, device maintenance and licensing fees was $125,000, $127,000 and $342,000, respectively.

Operating expenses recorded from transactions with GeneOne related primarily to biologics manufacturing and were $4.7 million, $2.5 million and $7.0 million for the years ended December 31, 2020, 2019 and 2018, respectively.

Plumbline Life Sciences, Inc.

The Company owned 597,808 shares of common stock in Plumbline Life Sciences, Inc. ("PLS") as of December 31, 2020 and one of the Company's directors, Dr. David B. Weiner, acts as a consultant to PLS.

On February 20, 2020, the Company entered into a Debt and Share Subscription Agreement with PLS under which the Company received 202,050 shares of PLS common stock in exchange for a portion of the outstanding accounts receivable balance due from PLS. Following the issuance of these shares and as of December 31, 2020, the Company held a 19.7% ownership interest in PLS.

Revenue recognized from PLS consists of milestone, license and patent fees. For the years ended December 31, 2020 and 2019, the Company recognized revenue from PLS of $1.4 million and $111,000, respectively. At December 31, 2020 and 2019, the Company had an accounts receivable balance of $67,000 and $589,000, respectively, related to PLS.

The Wistar Institute

The Company's director Dr. David B. Weiner is a director of the Vaccine Center of The Wistar Institute ("Wistar"). Dr. Weiner is also the Executive Vice President of Wistar.

In March 2016, the Company entered into collaborative research agreements with Wistar for preventive and therapeutic DNA-based immunotherapy applications and products developed by Dr. Weiner and Wistar for the treatment of cancers and infectious diseases. Under the terms of the agreement, the Company will reimburse Wistar for all direct and indirect costs incurred in the conduct of the collaborative research, not to exceed $3.1 million during the five-year term of the agreement. The Company will have the exclusive right to in-license new intellectual property developed in this agreement.

In November 2016, the Company received a $6.1 million sub-grant through Wistar to develop a DMAb against the Zika infection, with funding through December 2020.

The Company is also a collaborator with Wistar on an Integrated Preclinical/Clinical AIDS Vaccine Development grant from the NIAID, with funding through February 2021.

In 2020, the Company received a $10.7 million sub-grant through Wistar for the preclinical development and translational studies of DMAbs as countermeasures for COVID-19, with funding through September 2022. The sub-grant also includes an option for an additional $6.0 million in funding through September 2024.

Deferred grant funding recognized from Wistar and recorded as contra-research and development expense is related to work performed by the Company on the research sub-contract agreements. For the years ended December 31, 2020 and 2019, the Company recorded $1.9 million and $2.2 million, respectively, as contra-research and development expense from Wistar.

Research and development expenses recorded from Wistar relate primarily to the collaborative research agreements and sub-contract agreements related to Gates and CEPI (see Note 4). Research and development expenses recorded from Wistar for the years ended December 31, 2020 and 2019 were $2.3 million and $1.5 million, respectively. At December 31, 2020 and 2019, the Company had an accounts receivable balance of $425,000 and $616,000, respectively, and an accounts payable and accrued liability balance of $643,000 and $219,000, respectively, related to Wistar. As of December 31, 2020, the Company had $96,000 recorded as grant funding liability on its consolidated balance sheet related to Wistar.

19. Geneos Therapeutics, Inc.

In August 2016, the Company formed Geneos to develop and commercialize neoantigen-based personalized cancer therapies. Geneos was considered a variable interest entity (VIE) for which the Company was the primary beneficiary. In February 2019, Geneos completed the initial closing of a Series A preferred stock financing. The Company invested $1.2 million in the Series A preferred stock financing, which was led by an outside investor. Following this transaction, the Company held 61% of the outstanding equity, on an as-converted to common stock basis, of Geneos and continued to consolidate its investment in Geneos under ASC 810, *Consolidation*.

In January 2020, Geneos completed the second closing of the Series A preferred stock financing, in which the Company invested $800,000. Following this transaction, as of March 31, 2020, the Company held 52% of the outstanding equity, on an as-converted to common stock basis, of Geneos and continued to consolidate its investment in Geneos.

In June 2020, Geneos closed an additional Series A preferred stock financing round, in which the Company invested $800,000. Following this transaction, the Company owned 47% of the outstanding equity of Geneos on an as-converted to common stock basis. This transaction triggered a VIE reconsideration, as the Company no longer held a controlling financial interest. Based on the Company's assessment, Geneos continued to be a VIE as it did not have sufficient equity at risk to finance its activities without additional subordinated financial support. However, the Company was not the primary beneficiary of Geneos, as it did not have the power to direct the activities that most significantly impact Geneos' economic performance. Accordingly, the Company deconsolidated its investment in Geneos as of June 1, 2020, resulting in a gain of $4.1 million, of which $2.4 million related to the remeasurement of the retained noncontrolling interest investment to fair value. The gain has been recorded separately on the Company's consolidated statement of operations. The following table shows the amounts related to the deconsolidation accounting:

Working capital (excluding cash)	$	(59,992)
Note payable		171,620
Fixed assets, net of accumulated depreciation		(16,340)
Carrying value of noncontrolling interest		3,181,640
Fair value of investment in Geneos retained		3,618,998
Gain on deconsolidation of Geneos		(4,121,075)
Decrease in cash resulting from the deconsolidation of Geneos	$	2,774,851

The details of the Company's 47% retained equity investment in Geneos are shown in the table below, with fair values calculated as of June 1, 2020, the date of deconsolidation.

Geneos Share Class	Shares	Price per Share	Fair Value
Common	3,000,000	$ 0.273	$ 819,000
Preferred	2,113,206	$ 1.325	$ 2,799,998
Total	5,113,206		$ 3,618,998

The fair value of Geneos Series A preferred stock was based on the per share price paid by third-party investors in connection with the most recent closing of the Series A preferred stock financing for Geneos on June 1, 2020. The fair value of Geneos common stock was determined by a third-party valuation, as there is no public market for such stock. Geneos's enterprise value, which was estimated using a market approach that derived an implied total equity value from a transaction involving its own securities, was allocated to all classes of equity using the option pricing method. Under the option pricing method, each equity class was modeled as having a call option with a distinct claim on the total value of Geneos. Each option's exercise price was based on the total value available for each participating security holder. The characteristics of each class of ownership determined the claim on the total value for that class of ownership.

The estimated value allocated to common stock included assumptions related to the fair value of the enterprise, expected volatility, expected term, and risk-free interest rate. Expected volatility was based on historical asset volatilities derived from daily stock price changes of guideline public companies. The estimated expected term was based on a weighted average of the estimated time to Geneos's next financing and successful exit timing assumption. The risk-free interest rate was based on the yield of U.S. Treasury with a comparable term. Geneos's common stock is classified as a Level 3 financial instrument. The assumptions used in the fair value calculation as of June 1, 2020 are presented below:

Expected term (years)	2.92
Volatility	70%
Risk-free interest rate	2.46%
Geneos enterprise value	$4,966,531

The Company applies the equity method to investments in common stock and to other investments in entities that have risk and reward characteristics that are substantially similar to an investment in the investee's common stock. Since the Company's Series A preferred stock investment in Geneos has a substantive liquidation preference, it is not substantially similar to the Company's common stock investment and will therefore be recorded as an equity security under ASC 321.

As of June 1, 2020, the Company accounts for its common stock investment in Geneos, in which the Company lacks control but does have the ability to exercise significant influence over operating and financial policies, using the equity method. Generally, the ability to exercise significant influence is presumed when the investor possesses more than 20% of the voting interests of the investee. This presumption may be overcome based on specific facts and circumstances that demonstrate that the ability to exercise significant influence is restricted. In applying the equity method, the Company records the investment at cost unless the initial recognition is the result of the deconsolidation of a subsidiary, in which case it is recorded at fair value. The Company's proportionate share of net loss of Geneos is recorded in equity in net earnings of Geneos in the Company's consolidated statements of operations. The Company's equity method investments are reviewed for indicators of impairment at each reporting period and are written down to fair value if there is evidence of a loss in value that is other-than-temporary. Any difference between the carrying amount of the Company's investment and the amount of underlying equity in Geneos's net assets is amortized into income or expense accordingly. There were no basis differences identified as of the deconsolidation date that would need to be amortized.

Upon deconsolidation, the Company recorded its Series A preferred stock investment at fair value based on the per share price paid by third party investors in connection with the Series A preferred stock financing on June 1, 2020. The Company has determined that its Series A preferred stock investment in Geneos does not have a readily determinable fair value and has therefore elected the measurement alternative in ASC 321 to subsequently record the investment at cost, less any impairments, plus or minus changes resulting from observable price changes in orderly transactions for identical or similar investments of the same issuer. When fair value becomes determinable, from observable price changes in orderly transactions, the Company's investment will be marked to fair value. There have been no observable price changes or impairments identified since the deconsolidation date.

In November 2020, Geneos completed the closing of a Series A-1 preferred stock financing. The Company invested $1.4 million in the Series A-1 preferred stock financing, which was led by outside investors. The date of this transaction was determined to be a VIE reconsideration event; based on the Company's assessment, Geneos continues to be a VIE as it does not have sufficient equity at risk to finance its activities without additional subordinated financial support. The Company continues to not be the primary beneficiary of Geneos, as it does not have the power to direct the activities that most significantly impact Geneos's economic performance and should not consolidate Geneos. Following this transaction, the Company held approximately 36% of the outstanding equity, on an as-converted to common stock basis. Accordingly, the Company continues to account for its common stock investment in Geneos as an equity method investment under ASC 323 and its preferred stock investments as equity securities under ASC 321.

The fair value of Geneos's Series A-1 preferred stock was based on the per share price paid by third-party investors in connection with the closing on November 12, 2020. The Company has concluded that its Series A-1 preferred stock investment is not similar to its prior Series A preferred stock investment due to certain material rights held solely by Series A preferred stockholders. Therefore, the Company will continue to record its Series A preferred stock investment in Geneos at cost, as there have been no observable price changes or impairments identified since the deconsolidation date.

The Company's share of net losses of Geneos for the period from June 1, 2020 through December 31, 2020 was $4.6 million. Of this amount, $819,000 has been allocated to the equity method investment, thereby reducing the balance to $0 as of December 31, 2020. The remaining $3.8 million loss has been allocated to the Company's Series A and Series A-1 preferred stock investments in Geneos, on a ratable basis, thereby reducing the investment balance to $434,000 as of December 31, 2020 as shown in the table below:

Investment in Geneos upon deconsolidation	$	3,618,998
Investment in Geneos Series A-1 preferred stock		1,399,999
Share in net loss of Geneos		(4,584,610)
Investment in Geneos as of December 31, 2020	$	434,387

The Company continues to exclusively license its SynCon® immunotherapy and CELLECTRA® technology platform to Geneos to be used in the field of personalized, neoantigen-based therapy for cancer. The license agreement provides for potential royalty payments to the Company in the event that Geneos commercializes any products using the licensed technology. The Company is not obligated to use any of its assets to fund the future operations of Geneos.

20. Quarterly Financial Information (Unaudited)

The following is a summary of the quarterly results of operations of the Company for the years ended December 31, 2020 and 2019 (unaudited):

	Quarter Ended December 31, 2020	Quarter Ended September 30, 2020	Quarter Ended June 30, 2020	Quarter Ended March 31, 2020
Consolidated Statements of Operations:				
Revenues:				
Revenue under collaborative research and development arrangements	$ 5,003,494	$ 21,490	$ 74,102	$ 71,500
Revenue under collaborative research and development arrangements from affiliated entities	82,774	103,684	95,146	1,172,126
Other revenue, including from affiliated entities	494,313	111,004	97,939	83,648
Total revenues	5,580,581	236,178	267,187	1,327,274
Operating Expenses:				
Research and development	26,302,561	26,455,112	22,376,575	19,111,188
General and administrative	8,617,458	10,110,506	11,071,510	7,448,354
Total operating expenses	34,920,019	36,565,618	33,448,085	26,559,542
Loss from operations	(29,339,438)	(36,329,440)	(33,180,898)	(25,232,268)
Interest income	931,168	896,710	1,067,399	416,569
Interest expense	(1,068,008)	(1,984,046)	(2,846,641)	(2,803,755)
Change in fair value of derivative liability	—	35,306,000	(97,755,000)	(13,221,977)
Gain (loss) on investment in affiliated entities	306,317	26,951,898	(3,883,176)	13,181,619
Net unrealized gain on available-for-sale equity securities	1,070,975	1,315,980	4,358,634	(5,050,092)
Other income (expense), net	9,350	(136,644)	(152,102)	(425,500)
Gain on deconsolidation of Geneos	—	—	4,121,075	—
Loss on extinguishment of convertible bonds	—	(8,177,043)	—	—
Gain on extinguishment of convertible senior notes	5,674,435	3,087,595	—	—
Net income (loss) before income tax benefit and share in net loss of Geneos	$ (22,415,201)	$ 20,931,010	$ (128,270,709)	$ (33,135,404)
Share in net loss of Geneos	(1,923,179)	(1,759,674)	(901,757)	—
Net income (loss)	$ (24,338,380)	$ 19,171,336	$ (129,172,466)	$ (33,135,404)
Net loss attributable to non-controlling interest	—	—	469,407	594,350
Net income (loss) attributable to Inovio Pharmaceuticals, Inc.	$ (24,338,380)	$ 19,171,336	$ (128,703,059)	$ (32,541,054)
Net income (loss) per share				
Basic	$ (0.14)	$ 0.12	$ (0.83)	$ (0.26)
Diluted	$ (0.14)	$ 0.11	$ (0.83)	$ (0.26)

	Quarter Ended December 31, 2019	Quarter Ended September 30, 2019	Quarter Ended June 30, 2019	Quarter Ended March 31, 2019
Consolidated Statements of Operations:				
Revenues:				
Revenue under collaborative research and development arrangements	$ 184,523	$ 617,427	$ 64,283	$ 2,770,712
Revenue under collaborative research and development arrangements from affiliated entities	55,665	53,014	71,390	55,579
Other revenue, including from affiliated entities	39,300	196,422	—	3,614
Total revenues	279,488	866,863	135,673	2,829,905
Operating Expenses:				
Research and development	22,003,955	19,137,209	22,486,266	24,389,888
General and administrative	8,696,586	5,681,441	5,850,101	6,975,029
Total operating expenses	30,700,541	24,818,650	28,336,367	31,364,917
Loss from operations	(30,421,053)	(23,951,787)	(28,200,694)	(28,535,012)
Interest income	587,679	637,438	755,330	625,535
Interest expense	(2,668,837)	(2,428,671)	(2,194,783)	(656,248)
Change in fair value of derivative liability	(4,315,105)	2,551,453	—	—
Loss from investment in affiliated entities	(1,681,401)	(485,841)	(173,212)	(750,103)
Other income (expense), net	263,571	140,956	127,512	(35,839)
Net loss before income tax benefit	(38,235,146)	(23,536,452)	(29,685,847)	(29,351,667)
Income tax benefit	87,764	—	106,771	62,800
Net loss	(38,147,382)	(23,536,452)	(29,579,076)	(29,288,867)
Net loss attributable to non-controlling interest	485,344	445,759	191,850	69,605
Net loss attributable to Inovio Pharmaceuticals, Inc.	$ (37,662,038)	$ (23,090,693)	$ (29,387,226)	$ (29,219,262)
Net loss per share				
Basic	$ (0.38)	$ (0.23)	$ (0.30)	$ (0.30)
Diluted	$ (0.38)	$ (0.25)	$ (0.30)	$ (0.30)

21. Subsequent Events

On January 25, 2021, the Company closed an underwritten public offering of 20,355,000 shares of the Company's common stock at a public offering price of $8.50 per share. The net proceeds to the Company, after deducting the underwriters' discounts and commissions and other estimated offering expenses, were $162.1 million.

COLLABORATION AND LICENSE AGREEMENT

This **Collaboration and License Agreement** (the "**Agreement**") is entered into as of December 31, 2020 (the "**Effective Date**") by and between **Inovio Pharmaceuticals, Inc.**, a corporation organized and existing under the laws of Delaware and having a place of business at 60 W. Germantown Pike, Suite 110, Plymouth Meeting, PA 19462 USA ("**Inovio**"), and **Advaccine Biopharmaceuticals Suzhou Co., Ltd.**, a corporation having a place of business at B1-308, No. 218 Xinghu Street, Suzhou 214002, Jiangsu Province, China ("**Advaccine**"). Inovio and Advaccine are sometimes referred to herein individually as a "**Party**" and collectively as the "**Parties**."

RECITALS

Whereas, Inovio is currently conducting research and development of the Vaccine (as defined below) and the Product (as defined below);

Whereas, Advaccine is a pharmaceutical company with experience in developing pharmaceutical products in, among other regions, the Advaccine Territory (as defined below);

Whereas, the Parties have been collaborating in co-development of Vaccine since January 2020, including conducting preclinical studies, early stage clinical trials and other development activities in connection with the Product, and desire to continue the collaboration for the Development, Manufacturing and Commercialization of the Product (with each capitalized term as respectively defined below).

Whereas, in furtherance of such collaboration, Advaccine desires to obtain from Inovio an exclusive license subject to the limitations set forth below to Develop, Manufacture and Commercialize the Product in the Advaccine Territory (with each capitalized term as respectively defined below), and Inovio is willing to grant such license to Advaccine, all under the terms and conditions hereof; and

Whereas, Advaccine and Inovio are concurrently entering into that certain Non-exclusive License Agreement, dated as of the date hereof (the "**Non-Exclusive License Agreement**"), pursuant to which Advaccine grants Inovio a non-exclusive license to certain DNA vaccine manufacturing processes for use in the Advaccine Territory and Inovio Territory (each as defined below).

Now, Therefore, in consideration of the foregoing premises and the mutual promises, covenants and conditions contained in this Agreement, the Parties agree as follows:

Article 1.

Definitions

1.1 "**Accounting Standards**" means (i) for Inovio, the U.S. generally accepted accounting principles ("**GAAP**"), and (ii) for Advaccine, the International Financial Reporting

Standards ("**IFRS**") or any other accounting standards it is required to adopt under the applicable Laws, in either case consistently applied.

1.2 "**Act**" shall mean, as applicable, the United States Federal Food, Drug and Cosmetic Act, 21 U.S.C. §§301 et seq., and/or the Public Health Service Act, 42 U.S.C. §§262 et seq., as such may be amended from time to time.

1.3 "**Advaccine Patents**" means any Patents that claim Advaccine Inventions.

1.4 "**Advaccine Territory**" means, collectively, mainland China, Taiwan, Hong Kong and Macau (each a "**Region**").

1.5 "**Adverse Risk**" means any risk of an adverse effect on the Development, procurement or maintenance of Regulatory Approval, Manufacture or Commercialization of the Products.

1.6 "**Affiliate**" means, with respect to a particular Party, a Person that controls, is controlled by or is under common control with such Party. For the purposes of this definition, the word "control" (including, with correlative meaning, the terms "controlled by" or "under common control with") means the actual power, either directly or indirectly through one or more intermediaries, to direct or cause the direction of the management and policies of such entity, whether by the ownership of fifty percent (50%) or more of the voting stock of such entity, or by contract or otherwise. For clarity, once a Person ceases to be an Affiliate of a Party, then, without any further action, such Person shall cease to have any rights, including license and sublicense rights, under this Agreement by reason of being an Affiliate of such Party.

1.7 "**Anti-Corruption Laws**" means laws, regulations, or orders prohibiting the provision of a financial or other advantage for a corrupt purpose or otherwise in connection with the improper performance of a relevant function, including without limitation, to the extent applicable, the *Corruption of Foreign Public Officials Act (CFPOA)*, the *US Foreign Corrupt Practices Act (FCPA)*, the *UK Bribery Act 2010*, and similar laws governing corruption and bribery, whether public, commercial or both, to the extent applicable.

1.8 "**Array**" means device arrays used in combination with the Inovio Device.

1.9 "**Biosimilar Product**" means, with respect to a particular Product that has received Regulatory Approval for a particular indication in a particular Region and is being marketed and sold by Advaccine or any of its Affiliates or Sublicensees in the applicable Region, a biologic product that (a) is sold in such region by a Third Party that is not a sublicensee of Advaccine or its Affiliate, and where such Third Party did not purchase or acquire such product in a chain of distribution that included any of Advaccine or its Affiliates or sublicensees, and (b) has received Regulatory Approval (with all references in the definitions for Biosimilar Product and Regulatory Approval to the "Product" to be deemed references to such biologic product) in such Region for the same indication as the applicable Product as a "bioequivalent," "biosimilar" or similar designation of interchangeability by the applicable Regulatory Authority in such Region pursuant to an expedited or abbreviated approval process, where (i) such Product is the reference product in such Region, and (ii) such Regulatory Approval referred to or

relied on the approved Marketing Authorization Application for such Product held by Advaccine or its Affiliate or Sublicensee in such Region or the data contained or incorporated by reference in such approved Marketing Authorization Application for such Product in such Region.

1.10 "**Business Day**" means a day other than Saturday, Sunday or any day that banks in Suzhou, China; Plymouth Meeting, PA; or New York City, New York, are required or permitted to be closed.

1.11 "**Calendar Quarter**" means each successive period of three (3) consecutive calendar months ending on March 31, June 30, September 30, or December 31.

1.12 "**Change of Control**" means with respect to either Party: (a) the sale of all or substantially all of such Party's assets or business relating to this Agreement (other than to an Affiliate of such Party); (b) a merger, reorganization or consolidation involving such Party in which the voting securities of such Party outstanding immediately prior thereto cease to represent at least fifty percent (50%) of the combined voting power of the surviving entity immediately after such merger, reorganization or consolidation; or (c) a Person, or group of Persons, acting in concert acquire more than fifty percent (50%) of the voting equity securities or management control of such Party.

1.13 "**Clinical Trial**" means any clinical testing of a pharmaceutical or biologic product in human subjects.

1.14 "**CMC Information**" means Information related to the chemistry, manufacturing and controls of the Product, as specified by the FDA, NMPA and other applicable Regulatory Authorities.

1.15 "**Commercialization**" means all activities undertaken before and after obtaining Regulatory Approvals relating specifically to the pre-launch, launch, promotion, detailing, medical education and medical liaison activities, marketing, pricing, reimbursement, sale, and distribution of the Products, including strategic marketing, sales force detailing, advertising, market the Product support, all customer support, the Product distribution and invoicing and sales activities; *provided, however*, "**Commercialization**" shall exclude any activities relating to the Manufacture of the Product. "**Commercialize**" and "**Commercializing**" shall have the correlative meanings.

1.16 "**Commercially Reasonable Efforts**" means, with respect to either Party's obligations under this Agreement, the carrying out of such obligations with a level of efforts and resources consistent with the commercially reasonable practices of a similarly situated company in the pharmaceutical industry for the active and diligent commercialization of a similarly situated branded pharmaceutical product as the Product at a similar stage of commercialization, taking into account efficacy, safety, patent and regulatory exclusivity, anticipated or approved labeling, present and future market potential, competitive market conditions, the profitability of the product in light of pricing and reimbursement issues, and all other relevant factors. It is understood that in fulfilling any obligation to use Commercially Reasonable Efforts in this Agreement, a Party shall not take into account (i) any other pharmaceutical product such Party is then researching, developing, manufacturing or commercializing outside the scope of this Agreement, (ii) the payments required to be made by such Party to the other Party under this Agreement, (iii) such Party's access to sufficient personnel, capital or resources to

conduct its responsibilities hereunder in accordance with the foregoing standards or (iv) political considerations.

1.17 "**Common Technical Document**" or "**CTD**" means a set of specifications for application dossier adopted by the ICH for organizing applications of pharmaceuticals for human use to regulatory authorities.

1.18 "**Competing Product**" means any biological or pharmaceutical product, other than the Vaccine or the Product, that is intended for the prevention or treatment of the disease caused by SARS-CoV-2.

1.19 "**Confidential Information**" of a Party means any and all Information of such Party or its Affiliates that is disclosed to the other Party or its Affiliates under this Agreement, whether in oral, written, graphic, or electronic form. In addition, all Information disclosed by a Party or its Affiliates pursuant to the mutual non-disclosure agreement between Beijing Advaccine Biotechnology Co., Ltd. and Inovio dated January 27, 2020 (the "**Confidentiality Agreement**") shall be deemed to be Confidential Information of such Party disclosed hereunder; *provided, however,* that any use or disclosure of any such Information that is authorized under Article 12 shall not be restricted by, or be deemed a violation of, the Confidentiality Agreement. For clarity, Inovio Licensed Know-How shall be deemed Confidential Information of Inovio.

1.20 "**Control**" means, with respect to any material, Information, Patent or other intellectual property right, possession of the right, whether directly or indirectly, and whether by ownership, license, or otherwise, to grant a license, sublicense, or other right to or under, such material, Information, Patent, or intellectual property right without violating the terms of any existing agreement or other arrangement with any Third Party; provided that, with respect to any material, Information, Patent or other intellectual property right obtained by Inovio after the Effective Date from a Third Party, Inovio shall be deemed to Control such material, Information, Patent or other intellectual property right only if it possesses the right to grant such license, sublicense, or other right thereto without being obligated to pay any royalties or other consideration therefor, unless Advaccine agrees in advance of any grant of rights thereto to pay such royalties or other consideration.

1.21 "**Cover**" means, with respect to a Patent and a Product, that the Manufacture, use, offer for sale, sale or import of such Product by an unlicensed Third Party would infringe a Valid Claim in such Patent; provided, however, that in determining whether a claim of a pending Patent application would be infringed, it shall be treated as if issued in the form then currently being prosecuted. "**Covered**" and "**Covering**" shall have the correlative meanings.

1.22 "**CTA**" means a Clinical Trial Application which provides comprehensive information about the investigational medicinal product(s) and planned trial, enabling Regulatory Authorities to assess the acceptability of conducting the applicable study.

1.23 "**Data**" means all data, including CMC Information, non-clinical data, preclinical data and clinical data, generated by or on behalf of a Party or its Affiliates or their respective Sublicensees (in the case of Advaccine) or licensees, including Inovio Partners (in the case of Inovio), pursuant to activities conducted under this Agreement. For clarity, Data does not include any patentable Inventions.

1.24 "**Development**" means all activities conducted after the Effective Date relating to preclinical and clinical trials, toxicology testing, statistical analysis, publication and presentation of study results with respect to the Products, and the reporting, preparation and submission of regulatory applications (including any CMC Information) for obtaining, registering and maintaining Regulatory Approval of the Products; *provided, however*, "**Development**" shall exclude any activities relating to the Manufacture of the Product. "**Develop**" and "**Developing**" shall have the correlative meanings.

1.25 "**Drug Substance**" means bulk drug substance that is represented for use in a drug that, when used in the Manufacturing of a drug, becomes an active pharmaceutical ingredient.

1.26 "**EMA**" means the European Medicines Agency or any successor entity.

1.27 "**FDA**" means the U.S. Food and Drug Administration or any successor entity.

1.28 "**Field**" means all prophylactic and therapeutic use in humans.

1.29 "**First Commercial Sale**" means with respect to a Region, the first sale of a Product in such Region to a Third Party by or on behalf of Advaccine, its Affiliates or Sublicensees after Regulatory Approval has been obtained in such Region.

1.30 "**Fiscal Year**" means Advaccine's fiscal year that starts on January 1 and ends on December 31.

1.31 "**GCP**" or "**Good Clinical Practices**" means the then-current standards, practices and procedures promulgated or endorsed by the FDA as set forth in the guidelines entitled "Guidance for Industry E6 Good Clinical Practice: Consolidated Guidance," including related regulatory requirements imposed by the FDA, and comparable regulatory standards, practices and procedures promulgated by the NMPA or other Regulatory Authority applicable in the Advaccine Territory, as they may be updated from time to time, including applicable quality guidelines promulgated under the ICH.

1.32 "**GLP**" or "**Good Laboratory Practices**" means the then-current good laboratory practice standards promulgated or endorsed by the FDA as defined in 21 C.F.R. Part 58, and comparable regulatory standards promulgated by NMPA or other Regulatory Authority applicable to the Advaccine Territory, as may be updated from time to time, including applicable quality guidelines promulgated under the ICH.

1.33 "**GMP**" means (a) the good manufacturing practices required by the FDA and set forth in the FDCA or FDA regulations (including without limitation 21 CFR 210 and 211), policies, guidances or guidelines, or any applicable equivalent within a regulatory jurisdiction, including, without limitation, any applicable current good manufacturing practices requirements and pharmaceutical industry standards for the manufacture and testing of investigational pharmaceutical materials in force from time-to-time in the European Union (including, without limitation, Directive 2003/94/EC laying down the principles and guidelines of good manufacturing practice), the relevant national implementations of these rules and any relevant national and European Commission and Committee on Proprietary Medicinal Products guidance and, in particular, Annex 13 of the Guide to Good Manufacturing Practice entitled "Manufacture of investigational medicinal products", as updated and

amended from time-to-time, in each case in effect at any time during the term of this Agreement, for the manufacture, handling and testing of investigational pharmaceutical products; (b) the corresponding requirements of each applicable Regulatory Agency or other governmental authority, and (c) any other guidances, procedures, practices, arrangements, additions or clarifications, as the Parties may agree in writing from time-to-time.

1.34 "**Government Official**" means (a) any official or employee of any Governmental Authority, or any department, agency, or instrumentality thereof (including without limitation commercial entities owned or controlled, directly or indirectly, by a Governmental Authority), (b) any political party or official thereof, or any candidate for political office, or (c) any official or employee of any public international organization.

1.35 "**Governmental Authority**" means any multi-national, national, federal, state, local, municipal, provincial or other governmental authority of any nature (including any governmental division, prefecture, subdivision, department, agency, bureau, branch, office, commission, council, court or other tribunal).

1.36 "**ICH**" means International Conference on Harmonization of Technical Requirements for Registration of Pharmaceuticals for Human Use.

1.37 "**Information**" means any Data, results, technology, business or financial information or information of any type whatsoever, in any tangible or intangible form, including know-how, copyrights, trade secrets, practices, techniques, methods, processes, inventions, developments, specifications, formulae, software, algorithms, marketing reports, expertise, technology, test data (including pharmacological, biological, chemical, biochemical, clinical test data and data resulting from non-clinical studies), CMC Information, stability data and other study data and procedures.

1.38 "**Initiation**" means, with respect to a Clinical Trial, enrollment of the first patient in such Clinical Trial. "**Initiate**" and "**Initiating**" shall have the correlative meanings.

1.39 "**Inovio Device**" means Inovio's proprietary electroporation device CELLECTRA® 2000 and CELLECTRA® 3PSP, including any improvements and variants thereof Controlled by Inovio, and the associated Arrays, applicators and components.

1.40 "**Inovio Licensed Know-How**" means any and all Information (including Data and Regulatory Materials) that (a) (i) is Controlled by Inovio or its Affiliates as of the Effective Date or (ii) becomes Controlled by Inovio or its Affiliates during the Term, and (b) is necessary for the Development, Manufacture, or Commercialization of the Vaccine and/ or the Product in the Field in the Advaccine Territory. For clarity, Inovio Licensed Know-How shall include Inovio's interest in any Information included in Inovio Inventions and Joint Inventions.

1.41 "**Inovio Licensed Patents**" means any and all Patents that (a)(i) are Controlled by Inovio or its Affiliates as of the Effective Date or (ii) become Controlled by Inovio or its Affiliates during the Term, and (b) Cover the Vaccine and/or the Product in the Field in the Advaccine Territory. Inovio Licensed Patents include the Patents listed in **Exhibit A** and Inovio's interest in any Joint Patents that may be filed during the Term.

1.42 "**Inovio Product-Specific Licensed Patents**" means any Inovio Licensed Patents specifically claiming the composition of matter of, or the method of making or using, the Vaccine and/the Product in the Field in the Advaccine Territory. The Parties acknowledge and agree that the Patents listed in **Exhibit A** are Inovio Product-Specific Licensed Patents.

1.43 "**Inovio Technology**" means the Inovio Licensed Know-How and Inovio Licensed Patents.

1.44 "**Inovio Territory**" means the world except for the Advaccine Territory.

1.45 "**Inovio US Trial**" means a Phase 3 Clinical Trial or any other trials that are equivalent or similar to a Pivotal Clinical Trial, as requested by the FDA or at its own initiative, designed or intended to ascertain efficacy of the Product in a larger population, to be conducted by Inovio, itself or by its Affiliate or a Third Party in the U.S. or any other jurisdictions in the Inovio Territory.

1.46 "**Inventions**" means any inventions and/or discoveries, including processes, manufacture, composition of matter, Information, methods, assays, designs, protocols, and formulas, and improvements or modifications thereof, patentable or otherwise, that are generated, developed, conceived or reduced to practice (constructively or actually) by or on behalf of a Party or its Affiliates or their respective Sublicensees (in the case of Advaccine) or licensees, including Inovio Partners (in the case of Inovio) (a) pursuant to activities conducted under this Agreement, or (b) in connection with the Development, Manufacture, and Commercialization of the Product, in each case of (a) and (b), including all rights, title and interest in and to the intellectual property rights therein and thereto; *provided, however,* that Inventions shall exclude Data.

1.47 "**Joint Patents**" means any Patents that claim Joint Inventions.

1.48 "**Laws**" means all laws, statutes, rules, regulations, ordinances and other pronouncements having the effect of law of any federal, national, multinational, state, provincial, county, municipal, city or other political subdivision, domestic or foreign.

1.49 "**Manufacture**" and "**Manufacturing**" mean activities directed to manufacturing, processing, filling, finishing, packaging, labeling, quality control, quality assurance testing and release, post-marketing validation testing, inventory control and management, storing and transporting the Vaccine or the Product (as well as the Array), including oversight and management of vendors therefor.

1.50 "**Manufacturing Cost**" means, with respect to a particular drug product supplied by Inovio pursuant to Section 7.1: (a) if Inovio or its Affiliate Manufactures the applicable drug product, the actual manufacturing cost of such drug product (as determined in accordance with U.S. GAAP consistently applied with its other products); or (b) if a Third Party Manufactures such drug product, the actual transfer price paid by Inovio or its Affiliate to such Third Party for the Manufacture of such drug product without any additional mark-up; in each case of (a) and (b), excluding the external costs of insurance and transportation, import and export taxes and fees, and similar charges, for such drug product.

1.51 "**Marketing Authorization Application**" or "**MAA**" means new drug application, biologics license application, or other marketing authorization application to the appropriate Regulatory Authority for approval to market a Product, but excluding pricing approvals.

1.52 "**Net Sales**" means the gross amounts billed or invoiced by Advaccine, its Affiliates and their respective Sublicensees for sales of the Products to Third Parties, less the following deductions to the extent reasonable, customary, and actually allowed and taken with respect to such sales:

a. trade, cash or quantity discounts not already reflected in the amount invoiced, to the extent related to the gross amount billed or invoiced;

b. price reductions, rebates and administrative fees (including those paid or credited to pharmacy benefit managers, governmental authorities or otherwise) (provided that, such administrative fees shall not be in excess, in the aggregate of [***] of Net Sales with respect to any given Calendar Quarter);

c. shipping costs, including freight, insurance and other transportation charges or costs incurred in shipping of the Products to Third Parties (provided that, such shipping costs shall not be in excess of [***] of Net Sales with respect to any given Calendar Quarter);

d. sales, use, excise, value-added or similar taxes, customs duties and other governmental fees, charges and surcharges imposed on the sale of the Products;

e. amounts repaid or credited by reason of rejections, defects, recalls or returns;

f. amounts paid or credited for wholesaler chargebacks; and

g. any receivables that have been included in gross sales and are deemed to be uncollectible according to Accounting Standards (any such bad debt deductions shall be applied to Net Sales in the period in which such receivables are written off) (provided that, the amount of such receivables shall not be in excess of [***] of Net Sales with respect to any given Calendar Quarter).

Notwithstanding the foregoing, amounts received or invoiced by Advaccine, its Affiliates, or their respective Sublicensees for the sale of the Product among Advaccine, its Affiliates or their respective Sublicensees shall not be included in the computation of Net Sales hereunder unless the purchasing entity is the end-user. For purposes of determining Net Sales, the Product shall be deemed to be sold when billed or invoiced. Net Sales shall be accounted for in accordance with standard Advaccine practices for operation by Advaccine, its Affiliates or their respective Sublicensees, as practiced in the Advaccine Territory, but in any event in accordance with Accounting Standards consistently applied in the Advaccine Territory. For clarity, a particular item may only be deducted once in the calculation of Net Sales. Notwithstanding anything to the contrary in the foregoing, to the extent any amounts deducted pursuant to subsections (d) or (g) above are subsequently recovered by Advaccine, its Affiliates, or their respective Sublicensees during the Term, such recovered amounts shall be deemed "Net Sales" for the subsequent Calendar Quarter; provided that, if no royalties are owed by Advaccine

for such subsequent Calendar Quarter pursuant to Section 8.4, Advaccine shall promptly refund such recovered amounts to Inovio.

The transfer of any Product to an Affiliate, Sublicensee, or other Third Party (x) in connection with the research, development or testing of a Product (including, without limitation, the conduct of Clinical Trials), (y) for purposes of distribution as promotional samples, or (z) at nominal cost for indigent or similar public support or compassionate use programs, will not, in any case, be considered a Net Sale of a Product under this Agreement.

With respect to any transfer of any Product in the Advaccine Territory for any substantive consideration other than monetary consideration on arm's length terms, for the purposes of calculating the Net Sales under this Agreement, such Product shall be deemed to be sold exclusively for money at the average Net Sales price charged to Third Parties for cash sales in the Advaccine Territory during the applicable reporting period (or if there were only de minimus cash sales in the Advaccine Territory, at the fair market value as determined by comparable markets).

Advaccine, its Affiliates, and their respective Sublicensees shall sell the Product as a standalone product and will not sell the Product as a part of a bundle with other products or offer packaged arrangements to customers that include the Product, except with Inovio's prior written consent.

In the event that a Product is sold by Advaccine, its Affiliates or their respective Sublicensees in a relevant Region as part of a Combination Product, where "**Combination Product**" means any unified dose (*e.g.*, not a kit of two separate and distinct drug dosage forms that are priced and sold separately) of pharmaceutical product which is comprised of (x) a Product and (y) other therapeutically active compound(s) not licensed by Inovio to Advaccine hereunder (collectively the "**Other Products**"), Net Sales of such Product, for the purposes of determining royalty payments, shall be determined by the subsections below:

(i) [***]

(ii) [***]

1.53 "**NMPA**" means the National Medical Products Administration of the People's Republic of China, formerly known as the China Food and Drug Administration, or any successor agency or authority thereto.

1.54 "**Patents**" means (a) pending patent applications, issued patents, utility models and designs; (b) reissues, substitutions, confirmations, registrations, validations, re-examinations, additions, continuations, continued prosecution applications, continuations-in-part, or divisions of or to any of the foregoing; and (c) extensions, renewals or restorations of any of the foregoing by existing or future extension, renewal or restoration mechanisms, including supplementary protection certificate, patent term additions, patent term extensions or the equivalent thereof.

1.55 "**Person**" means an individual, corporation, partnership, limited liability company, limited partnership, trust, business trust, association, joint stock company, joint venture,

pool, syndicate, sole proprietorship, unincorporated organization, Governmental Authority or any other form of entity not specifically listed herein.

1.56 "**Phase 2 Clinical Trial**" means any human clinical trial of a Vaccine conducted mainly to test the effectiveness of chemical or biologic agents or other types of interventions for purposes of identifying the appropriate dose for a Phase 3 Clinical Trial for a particular indication or indications that would satisfy the requirements of 21 CFR § 312.21(b) or its non-United States equivalents. A "Phase 2/3 Clinical Trial" shall be deemed to be a Phase 2 Clinical Trial with respect to the portion of that clinical trial that is regarded as its Phase 2 component, in accordance with the applicable protocol.

1.57 "**Phase 3 Clinical Trial**" means any human clinical trial of a Vaccine designed to: (i) establish that such Product is safe and efficacious for its intended use; (ii) define warnings, precautions and adverse reactions that are associated with the Product in the dosage range to be prescribed; and (iii) support regulatory approval of such Product, that would satisfy the requirements of 21 CFR § 312.21(c) or its non-United States equivalents. A "Phase 2/3 Clinical Trial" shall be deemed to be a Phase 3 Clinical Trial with respect to the portion of that clinical trial that is regarded as its Phase 3 component, in accordance with the applicable protocol.

1.58 **"Pivotal Clinical Trial"** means a pivotal study in human patients with a defined dose or a set of defined doses of the Product designed or intended to ascertain efficacy and safety of the Product for the purpose of enabling the preparation and forming the primary basis for submission of a Marketing Authorization Application for the Product to the competent Regulatory Authority in a Region of the Advaccine Territory, which may be a Phase 2 Clinical Trial or a Phase 3 Clinical Trial.

1.59 "**Product(s)**" means any pharmaceutical/biological product in any form comprising the Vaccine, with or without an Inovio Device.

1.60 "**Proper Conduct Practices**" means, Advaccine, its Affiliates and Sublicensees, and each of their Representatives not, directly or indirectly, (a) making, offering, authorizing, providing or paying anything of value in any form, whether in money, property, services or otherwise to any Government Official, or other Person charged with similar public or quasi-public duties, or to any customer, supplier, or any other Person, or to any employee thereof, or failing to disclose fully any such payments in violation of the laws of any relevant jurisdiction to (i) obtain favorable treatment in obtaining or retaining business for it or any of its Affiliates, (ii) pay for favorable treatment for business secured, (iii) obtain special concessions or for special concessions already obtained, for or in respect of it or any of its Affiliates, in each case which would have been in violation of any applicable Laws, (iv) influence an act or decision of the recipient (including a decision not to act) in connection with the Person's or its Affiliate's business, (v) induce the recipient to use his or her influence to affect any government act or decision in connection with the Person's or its Affiliate's business or (vi) induce the recipient to violate his or her duty of loyalty to his or her organization, or as a reward for having done so; (b) engaging in any transactions, establishing or maintaining any fund or assets in which it or any of its Affiliates shall have proprietary rights that have not been recorded in the books and records of it or any of its Affiliates; (c) making any unlawful payment to any agent, employee, officer or director of any Person with which it or any of its Affiliates does business for the purpose of influencing such agent, employee, officer or director to do business with it or any of its Affiliates; (d) violating any

provision of applicable Anti-Corruption Laws; (e) making any payment in the nature of bribery, fraud, or any other unlawful payment under the applicable Laws of any jurisdiction where it or any of its Affiliates conducts business or is registered; or, (f) if such Person or any of its Representatives is a Government Official, improperly using his or her position as a Government Official to influence the award of business or regulatory approvals to or for the benefit of such Person, its Representatives or any of their business operations, or failing to recuse himself or herself from any participation as a Government Official in decisions relating to such Person, its Representatives or any of their business operations.

1.61 "**Regulatory Approval**" means any and all approvals (including marketing authorization approvals, supplements, amendments, pre- and post-approvals, and pricing and reimbursement approvals), licenses, registrations or authorizations of any national, supra-national, regional, state or local regulatory agency, department, bureau, commission, council or other governmental entity, that are necessary for the Manufacture, distribution, marketing, importation, exportation, use or commercial sale of a Product in a given country or regulatory jurisdiction.

1.62 "**Regulatory Authority**" means, in a particular country or jurisdiction, any applicable Governmental Authority involved in granting Regulatory Approval in such country or jurisdiction.

1.63 "**Regulatory Materials**" means regulatory applications (including CTA and MAA), submissions, notifications, communications, correspondence, registrations, Regulatory Approvals and/or other filings made to, received from or otherwise conducted with a Regulatory Authority in order to Develop, Manufacture, market, sell or otherwise Commercialize the Products in a particular country or jurisdiction.

1.64 "**Representatives**" means, as to any Person, such Person's Affiliates and its and their successors, controlling Persons, directors, officers and employees.

1.65 "**Sublicensee**" means a Third Party that has received a license or other right under the Inovio Technology in accordance with Section 2.1(c), but shall not include (i) any Third Party wholesaler or distributor engaged for the sale of the Product (even if such wholesaler or distributor is granted a right or license to sell Product) provided that such wholesaler or distributor does not make any royalty, milestone, profit share or other payment to Advaccine or its Affiliate based on such wholesaler's or distributor's sale of the Product; or (ii) any Third Party contract research organization or manufacturer providing services to Advaccine or its Affiliate (even if such contract research organization or manufacturer is granted a right or license to make the Vaccine or the Product). For clarity, the gross invoiced price for sale of the Product to any wholesaler, distributor, contract research organization or manufacturer described above shall be included in Net Sales.

1.66 "**Third Party**" means any Person other than a Party or an Affiliate of a Party.

1.67 "**U.S. Dollar**" means a U.S. dollar, and "**US$**" shall be interpreted accordingly.

1.68 "**U.S.**" or "**USA**" means the United States of America, including all possessions and territories thereof.

1.69 "**Vaccine**" means INO-4800, which includes the DNA plasmid identified as pGX9501, encoding the Spike protein of SARS-CoV-2.

1.70 "**Valid Claim**" means a claim (including a process, use, or composition of matter claim) of (a) an issued and unexpired patent that has not (i) irretrievably lapsed or been revoked, dedicated to the public or disclaimed or (ii) been held invalid, unenforceable or not patentable by a court, governmental agency, national or regional patent office or other appropriate body that has competent jurisdiction, which holding, finding or decision is final and unappealable or unappealed within the time allowed for appeal, or (b) a pending patent application that has been prosecuted in good faith pending for no more than seven (7) years since its priority date and has not been abandoned or finally disallowed without the possibility of appeal.

1.71 "**Year**" means any period of twelve (12) consecutive months.

1.72 **Additional Definitions**: The following table identifies the location of definitions set forth in various Sections of the Agreement:

Defined Terms	**Section**
Accused Party	9.5
Advaccine	Preamble
Advaccine Housemarks	9.6(b)
Advaccine Indemnitees	11.1
Advaccine Inventions	9.1(d)(ii)
Advaccine Product Mark	9.6(a)
Advaccine Sublicense Agreement	2.1(c)
Agreement	Preamble
Alliance Manager	3.1
Bankruptcy Laws	15.13
Claims	11.1
Clinical Manufacturing Technology Transfer Agreement	7.1(c)
Clinical Supply Agreement	7.1(a)
Combination Product	1.52
Commercialization Plan	6.2(a)
Confidentiality Agreement	1.19
Development Plan	4.3
Divestiture	2.5
Effective Date	Preamble
Enforcing Party	9.4(c)
Executive Officer	14.1
First Supplemental Development Plan	4.3
GAAP	1.1
IFRS	1.1

Indemnified Party	11.3
Indemnifying Party	11.3
Infringement	9.4(a)
Infringement Action	9.5
Initial Development Plan	4.3
Inovio	Preamble
Inovio Device Commercial Supply Agreement	7.2(a)
Inovio Indemnitees	11.2
Inovio Inventions	9.1(d)(i)
Inovio Partner	2.2
Insolvency Event	13.5
Insolvent Party	15.13
Joint Inventions	9.1(d)(iii)
Joint Steering Committee	3.2(a)
Losses	11.1
Non-Exclusive License Agreement	Recitals
Non-Insolvent Party	15.13
Other Products	1.52
Party	Preamble
PDF	15.12
Pharmacovigilance Agreement	5.8
Product Materials	4.7
Region	1.4
Remedial Action	5.9
Royalty Term	8.4(b)
SEC	12.3(c)
Securities Regulators	12.2(c)
SIAC	14.2
SIAC Rules	14.2
Step-In Rights	9.2(d)
Tax Withholding	8.9(b)
Term	13.1
VAT	8.9(c)
Working Group	3.5

Article 2.

License

2.1 License to Advaccine.

(a) License Grant. Subject to the terms and conditions of this Agreement, Inovio hereby grants Advaccine an exclusive (even as to Inovio except as provided in Section 2.1(b) below) license, with the right to sublicense (solely as provided in Section 2.1(c)), under the Inovio Technology, to Develop, Manufacture and have Manufactured (solely in accordance with Section 7.2), distribute, market, promote, sell, have sold, offer for sale, import, label, package and otherwise Commercialize the Products in the Field in the Advaccine Territory. For clarity, no rights shall be granted to Advaccine under this Section 2.1(a), with respect to the Development, Manufacture or Commercialization of any product containing or using for administration an Inovio Device without the Vaccine. For further clarity and unless otherwise agreed in Section 2.1(d), no rights shall be granted to Advaccine under this Section 2.1(a) with respect to the Manufacture of the Inovio Device other than the right to Manufacture the Arrays in the Advaccine Territory. As consideration for the foregoing license and access to and transfers of know-how under this Agreement, Advaccine will make certain payments to Inovio as set out in, and subject to the terms and conditions of, Article 8.

(b) Inovio Retained Rights. Notwithstanding the exclusive rights granted to Advaccine in Section 2.1(a), Inovio and its Affiliates shall retain the following:

i. the right to practice the Inovio Technology within the scope of the license granted to Advaccine under Section 2.1(a) in order to perform, or have performed by a Third Party contractor, Inovio's obligations under this Agreement;

ii. the right to Manufacture or have Manufactured the Products anywhere in the world for sale and use in the Inovio Territory, provided that Inovio shall obtain prior written consent, not to be unreasonably withheld, from Advaccine before Manufacturing or having Manufactured the Products in the Advaccine Territory using any rights granted to Inovio under the Non-Exclusive License Agreement for sale and use in the Inovio Territory; and

iii. the right to practice and license the Inovio Technology outside the scope of the license granted to Advaccine under Section 2.1(a).

(c) Sublicense Rights. Advaccine shall not have the right to grant sublicenses of the license granted in Section 2.1(a) without Inovio's express prior written consent, except that Advaccine may grant such sublicense without Inovio's consent to its Affiliates. Upon receiving approval from Inovio for the grant of a sublicense to a Third Party, Advaccine shall, within thirty (30) days after granting any such sublicense, notify Inovio of the grant of such sublicense and provide Inovio with a true and complete copy of the sublicense agreement (which may have financial information and other confidential information redacted, provided that such redacted information is not reasonably necessary for Inovio to assess compliance of the sublicense agreement with this Section 2.1(c)) (each, a "**Advaccine Sublicense Agreement**"). Each Advaccine Sublicense Agreement shall be consistent with the terms and conditions of this Agreement, and Advaccine shall be solely responsible for all of its Sublicensees' activities and any and all failures by its Sublicensees to comply with the applicable terms of this Agreement. Without limiting the foregoing, each Advaccine Sublicense Agreement shall include the following additional terms and conditions:

i. the Sublicensee shall be bound by non-use and non-disclosure obligations no less stringent than those set forth in this Agreement;

ii. the Sublicensee shall not have any right to grant further sublicenses to the Inovio Technology (excluding sublicenses to Third Party contractors, including distributors and wholesalers);

iii. the Sublicensee shall not have any right to prosecute or maintain or enforce any Inovio Licensed Patents; and

iv. the Sublicensee shall assign or license to Advaccine all Data and Inventions generated by such Sublicensee, and shall grant Advaccine all of the rights necessary for Advaccine to fulfill its obligations under Sections 9.1(a) and 9.1(d).

(d) Additional License. Inovio hereby agrees to expand the license granted to Advaccine under Section 2.1 for Advaccine, by itself or through any ofits Affiliates or a Third Party, to conduct the Phase 3 Clinical Trial in the Inovio Territory at Advaccine's own cost and expense for the purpose of obtaining the Regulatory Approval of the Product in the Advaccine Territory, in the event of (i) unless a Phase 3 Clinical Trial in the Inovio Territory has already been completed, a Change of Control of Inovio, where the acquirer of Inovio, by itself or through any of its Affiliates or a Third Party, is developing, manufacturing or commercializing any Competing Product for the Advaccine Territory; (ii) an official request by any Regulatory Authority in the Advaccine Territory; (iii) the occurrence of such circumstances as described in Section 4.2; or (iv) otherwise upon mutual agreement of the Parties; provided, however, that Inovio shall have the right to review and approve the protocols and design of such Phase 3 Clinical Trial. Inovio hereby agrees to expand the license granted to Advaccine under Section 2.1 for Advaccine to have the Inovio Device Manufactured in the U.S. or any other mutually agreed upon country by a Third Party contract manufacturer for use with the Product in the Advaccine Territory in the event of the occurrence of an Insolvency Event of Inovio.

2.1 Inovio Partner. Inovio has the right, in its sole discretion, to enter into one or more agreements with Third Parties and grant such Third Parties the right to Develop, Manufacture and/or Commercialize the Products in one or more countries in the Inovio Territory (each such Third Party, a "**Inovio Partner**"); provided that (a) Inovio shall remain solely responsible for any Inovio Partner's activities, and (b) the grant of such rights to such Inovio Partner shall not affect Inovio's obligations under the Agreement. So long as such Inovio Partner(s) is not actively developing or commercializing any Competing Product in the Advaccine Territory, (i) Inovio shall have the right (but not the obligation) to fulfill any of its obligations under this Agreement through Inovio Partner(s), including Inovio's obligations under Article 3, and (ii) Inovio shall have the right to disclose to Inovio Partner(s) all Information solely regarding the Products, including all Regulatory Materials relating thereto, disclosed by Advaccine to Inovio under this Agreement, for use by Inovio Partner(s) in their Development, Manufacture and Commercialization of the Product in the Inovio Territory; *provided, however,* that (A) all such Information disclosed to Inovio Partner(s) by Inovio shall be deemed the Confidential Information of Advaccine, and (B) any Inovio Partner(s) that receive such information shall be obligated to abide by restrictions on disclosure and use substantially similar to the provisions set forth in Section 12.1 and Inovio shall remain responsible for the Inovio Partner(s)' performance of such obligations and compliance with such restrictions.

2.3 Negative Covenant. Advaccine covenants that, except as explicitly set forth in this Agreement, it will not, and will not permit any of its Affiliates or Sublicensees to, use or practice any Inovio Technology outside the scope of the license granted to it under Section 2.1(a).

2.4 No Implied Licenses. Except as explicitly set forth in this Agreement, neither Party shall be deemed by estoppel or implication to have granted the other Party any license or other right to any intellectual property of such Party.

2.5 Exclusivity.

(a) Exclusivity Covenant. During the Term, Advaccine hereby covenants not to, itself or through any Affiliate or Third Party, Develop, Manufacture or Commercialize any Competing Product in the Field in the Advaccine Territory. For clarity, the foregoing restrictions shall not apply to (i) internal research and internal non good laboratory practices preclinical work by either Party; and (ii) any Development, Manufacture and Commercialization of any Combination Product by Advaccine in the Advaccine Territory upon mutual agreement of the Parties.

(b) Advaccine Change of Control. In the event that, in connection with an Advaccine Change of Control, Advaccine or any of its Affiliates obtains or holds the rights to a Competing Product that would cause Advaccine to be in breach of Section 2.5(a), then upon written notice to Inovio within thirty (30) days after such rights are first obtained, Advaccine shall elect one of the following: (A) to terminate this Agreement pursuant to Section 13.2, in which case such notice will serve as notice of termination under Section 13.2; or (B) to (or have its Affiliate) sell, exclusively license or transfer rights to the Competing Product to a Third Party without Advaccine or any of its Affiliates receiving a continuing share of profit, royalty payments, or other economic interest in the success of such Competing Product in the Advaccine Territory (a "**Divestiture**"), in which case Advaccine or any of its Affiliates shall, or shall cause the applicable entity to, complete the Divestiture of such Competing Product within twelve (12) months from the date of such Advaccine Change of Control, in which case the conduct of activities with respect to such Competing Product by Advaccine or any of its Affiliates during such 12-month period shall not be deemed a breach of Advaccine's exclusivity obligations under Section 2.5, provided that such activities with respect to such Competing Product during such 12-month period are conducted independently of the activities conducted under this Agreement and no Inovio Technology or Advaccine Inventions is used in the conduct of such activities.

2.6 Transfer of Inovio Licensed Know-How. Inovio shall provide Advaccine with complete and accurate copies of the Inovio Licensed Know-How directly applicable to the Vaccine, the Product and the Arrays to the extent expressly provided for in **Exhibit B** and in accordance with the timeline specified therein. The JSC shall establish a reasonable process and schedule for the transfer of additional Inovio Licensed Know-How related to the Vaccine, the Product and the Array as required for the filing of an MAA in the Advaccine Territory and any other necessary Inovio Licensed Know-How that subsequently comes into existence and becomes Controlled by Inovio or its Affiliates during the Term. Inovio shall reasonably cooperate with Advaccine in providing Advaccine only with copies of such Inovio Licensed Know-How directly applicable to the Vaccine, the Product and the Array (but not the Inovio Device) in accordance with the process and schedule agreed upon through the JSC.

Article 3.

Governance

3.1 Alliance Managers. Within thirty (30) days after the Effective Date, each Party shall appoint and notify the other Party of the identity of a representative having the appropriate qualifications, including a general understanding of pharmaceutical development, manufacturing, and commercialization issues, to act as its alliance manager under this Agreement (the "**Alliance Manager**"). The Alliance Managers shall serve as the primary contact points between the Parties for the purpose of providing each Party with information on the progress and results of Advaccine's Development, Manufacturing, and Commercialization of the Products. The Alliance Managers shall also be primarily responsible for facilitating the flow of information and otherwise promoting communication, coordination and collaboration between the Parties with respect to the Products. Each Party may replace its Alliance Manager at any time upon written notice to the other Party.

3.2 Joint Steering Committees.

(a) Formation; Purpose. Within thirty (30) days after the Effective Date, the Parties shall establish a joint steering committee (the "**Joint Steering Committee**" or "**JSC**") for the overall coordination and oversight of the Parties' activities under this Agreement. The role of the JSC shall be:

i. to review, discuss and coordinate the overall strategy for the Development, Manufacturing, and Commercialization of the Products and the Modified Products in the Field in the Advaccine Territory, including related regulatory activities;

ii. to review, discuss and approve the Initial Development Plan and any proposed amendments or revisions to the Development Plan, including the First Supplemental Development Plan and those with respect to clinical Development activities set forth in Section 4.4(b);

iii. to review and discuss (but not approve) the Commercialization Plan and any proposed amendments or revisions to such plan, and review and discuss (but not approve) the Commercialization of the Products in the Field in the Advaccine Territory (including any pricing strategy with respect to the Products);

iv. to coordinate the Commercialization of the Products in the Advaccine Territory and Inovio Territory to ensure consistent global marketing of the Products in the Field; and

v. to perform such other functions as appropriate to further the purposes of this Agreement, as expressly set forth in this Agreement or as determined by the Parties in writing.

(b) Members. The JSC shall be comprised of an equal number of representatives from each Party. Each Party's representatives shall be an officer or employee of such Party or its Affiliate having sufficient seniority within the applicable Party to make decisions arising within the

scope of the JSC's responsibilities. In addition, at least one of Advaccine's JSC representatives must be someone whose job responsibilities within Advaccine include active involvement in the development and implementation of Advaccine's Development (including regulatory) strategy with respect to the Products in the Field in the Advaccine Territory (at all times that Advaccine or its Affiliate or sublicensee is conducting such Development) or Advaccine's Commercialization strategy with respect to the Products in the Field in the Advaccine Territory (at all times that Advaccine or its Affiliate or sublicensee is conducting such Commercialization), and each of Advaccine's JSC representatives must have up-to-date knowledge of Advaccine's ongoing and planned Development (including regulatory) and Commercialization activities with respect to the Products in the Field in the Advaccine Territory (at all times that Advaccine is conducting such activities). Each Party shall initially appoint two (2) representatives to the JSC. The JSC may change its size from time to time by unanimous consent of its representatives, and each Party may replace its representatives at any time upon written notice to the other Party. Each Party shall appoint one (1) of its representatives on the JSC to act as the co-chairperson. The role of the co-chairpersons shall be to convene and preside at the JSC meetings and to ensure the circulation of meeting agendas at least five (5) Business Days in advance of JSC meetings and the preparation of meeting minutes and any pre-read materials in accordance with Section 3.2(c), but the co-chairpersons shall have no additional powers or rights beyond those held by other JSC representatives. Employees or consultants of either Party that are not representatives of the Parties on the JSC may attend meetings of the JSC, provided that such attendees shall not vote or otherwise participate in the decision-making process of the JSC and are subject to obligations of confidentiality substantially similar to the provisions set forth in Section 12.1.

(c) Meetings. The JSC shall meet at least once per Calendar Quarter during the Term, unless the Parties mutually agree in writing to a different frequency for such meetings. Either Party may also call a special JSC meeting (by videoconference or teleconference) by at least ten (10) Business Days prior written notice to the other Party in the event such Party reasonably believes that a significant matter must be addressed prior to the next regularly scheduled meeting, and such Party shall provide the JSC no later than ten (10) Business Days prior to the special meeting with materials reasonably adequate to enable an informed decision. The JSC may meet in person, by videoconference or by teleconference. All JSC meetings shall be conducted in English, and all communications, reports and records by and between the Parties under this Agreement shall be in English. The co-chairpersons shall alternate responsibility for preparing reasonably detailed written minutes of the JSC meetings that reflect, without limitation, all material decisions made at such meetings. The co-chairpersons (or their designees) shall send draft meeting minutes to each representative of the JSC for review and approval within ten (10) Business Days after the JSC meeting. Such minutes shall be deemed approved unless one or more JSC representatives object to the accuracy of such minutes within ten (10) Business Days of receipt.

(d) Decision Making. The JSC shall strive to seek consensus in its actions and decision making process and all decisions by the JSC shall be made by consensus, with each Party having collectively one (1) vote in all decisions. If after reasonable discussion and good faith consideration of each Party's view on a particular matter before the JSC, the representatives of the Parties cannot reach an agreement as to such matter (to the extent that such matter requires the agreement of the Parties hereunder) within ten (10) Business Days after such matter was brought to the JSC for resolution or after such matter has been referred to the JSC, then, Advaccine's Executive Officer

shall have the final decision making authority with respect to such matter within the JSC's authority; *provided, however,* that Inovio's Executive Officer shall have the right in their sole discretion to veto any decision by Advaccine reasonably likely to result in Adverse Risk on the Inovio Technology, or the safety or efficacy of the Product, or the Development or Commercialization of the Product in the Inovio Territory, including any global Clinical Trial of Product or Regulatory Approval of any Product in the Inovio Territory, and *provided, further*, that (i) any decision to Develop, Manufacture or Commercialize the Product as a Combination Product in the Advaccine Territory will require the mutual agreement of the Parties, and (ii) Advaccine shall not have the right, by virtue of its decision-making authority, to cause Inovio to violate the terms of any agreement with a Third Party, or cause Inovio to violate any applicable Laws, ethical requirement, or intellectual property right of any Third Party, and Advaccine's exercise of its decision-making authority shall be subject to the limitations set forth in Section 3.3; provided, that Inovio shall provide Advaccine with an explanation as to why any such decision of Advaccine would cause Inovio to violate the terms of any agreement with a Third Party, or cause Inovio to violate any applicable Laws, ethical requirement, or intellectual property right of any Third Party.

For clarity, the JSC shall be a forum for discussing, but shall not have any decision-making authority with respect to, Inovio's Development of the Product in the Inovio Territory, and Inovio shall have full control and authority over the Development, Commercialization of the Product in the Inovio Territory.

3.3 Limitation of JSC Authority. The JSC shall only have the powers expressly assigned to it in this Article 3 and elsewhere in this Agreement and shall not have the authority to: (a) modify or amend the terms and conditions of this Agreement; (b) waive or determine either Party's compliance with the terms and conditions of under this Agreement; or (c) decide any issue in a manner that would conflict with the express terms and conditions of this Agreement.

3.4 Discontinuation of the JSC. The activities to be performed by the JSC shall solely relate to governance under this Agreement, and are not intended to be or involve the delivery of services. The JSC shall continue to exist until the first to occur of: (a) the Parties mutually agree to disband the JSC; or (b) Inovio provides written notice to Advaccine of its intention to disband and no longer participate in the JSC. Thereafter, the JSC shall have no further obligations under this Agreement and each Party shall designate a contact person for the exchange of information relevant to activities that would have been performed by the JSC under this Agreement and decisions of the JSC shall be decisions as between the Parties, subject to the other terms and conditions of this Agreement.

3.5 Working Groups. From time to time, the JSC may establish and delegate duties of the JSC to sub-committees or directed teams (each, a "**Working Group**") on an "as-needed" basis to oversee particular projects or activities; provided that in any case neither Party shall be required by the Working Group to assume any responsibility, financial or otherwise, beyond those agreed to in writing by such Party, in particular pursuant to each Party's respective obligations under this Agreement. Each such Working Group shall be constituted and shall operate as the JSC determines. Working Groups may be established on an ad hoc basis for purposes of a specific project or on such other basis as the JSC may determine. Each Working Group and its activities shall be subject to the oversight, review and approval of, and shall report to, the JSC. In no event shall the authority of the Working Group exceed that of the JSC. All decisions of a Working Group shall be by

consensus. Any disagreement between the members of a Working Group shall be referred to the JSC for resolution.

Article 4.

DEVELOPMENT

4.1 Overview; Diligence of Advaccine. Subject to the terms and conditions of this Agreement (including the diligence obligations set forth below), Advaccine shall be solely responsible for the Development of the Products in the Field in the Advaccine Territory, at its own cost and expense (except as otherwise expressly set forth herein), including (except as set forth in Section 4.7) all non-clinical and clinical studies and collection of CMC Information, as necessary to obtain the Regulatory Approval for the Products in any Region in the Advaccine Territory. Advaccine shall maintain adequate funding and use Commercially Reasonable Efforts to Develop and obtain the Regulatory Approval for the Products in the Field in each Region in the Advaccine Territory. Without limiting the generality of the foregoing, Advaccine shall use Commercially Reasonable Efforts to conduct its Development activities under and in accordance with the Development Plan, as well as Manufacturing activities related to such Development, as set forth in the Initial Development Plan.

4.2 Diligence of Inovio. Inovio shall use Commercially Reasonable Efforts to Develop and obtain the Regulatory Approval for the Products in the Field in the United States, and shall provide all reasonable assistance and cooperation to assist and support Advaccine, at Advaccine's sole cost and expense, as specified in this Agreement, the Development Plan or as reasonably requested by Advaccine from time to time, in obtaining the Regulatory Approval for the Products (as well as the Inovio Device and the Array for use in connection with the Products) in the Advaccine Territory. Except for circumstances provided in Section 2.1 (d) (i), (ii) and (iv), in the event that, within twelve (12) months from the Effective Date, the Inovio US Trial is not Initiated or Inovio decides not to conduct or is not required to conduct the Inovio US Trial, Inovio shall inform Advaccine thereof in writing. In such an event, Advaccine may elect to conduct a Phase 3 Clinical Trial in the Inovio Territory at its own cost and expense for the purpose of obtaining Regulatory Approval of the Product in the Advaccine Territory, subject to Section 2.1(d); provided, however, that Inovio shall have the right to review and approve the protocols and design of such Phase 3 Clinical Trial.

4.3 Development Plan. Without limiting the generality of the other provisions in this Article 4, within thirty (30) days after the Effective Date, Advaccine (in conjunction with assistance from Inovio) will prepare and submit to the JSC an initial, summary plan and budget for research and Development of the Vaccine and the Products in the Field in the Advaccine Territory (the "**Initial Development Plan**"), which Initial Development Plan shall be mutually agreed upon by the Parties. Within ninety (90) days after the Effective Date, Advaccine (in conjunction with assistance from Inovio) will prepare and submit to the JSC a detailed plan containing the strategy, activities, study designs, timeline, study material needs (including Inovio Devices and the Vaccine) and budget for research and Development of the Vaccine and the Products in the Field in the Advaccine Territory (the "**First Supplemental Development Plan**," and together with the Initial Development Plan and any subsequent updates pursuant to this Section 4.3, the "**Development Plan**"). The First Supplemental Development Plan shall include among other things, all material non-clinical and clinical studies, CMC Information collection activities and regulatory activities with respect to the Vaccine and the Products to be

conducted by or on behalf of Advaccine or its Affiliates or their respective Sublicensees in the Advaccine Territory. From time to time during the Term (but at least once per Fiscal Year), Advaccine shall prepare amendments and updates, as appropriate, to the then-current Development Plan, and shall submit such amendments and updates to the JSC in accordance with Section 4.4. For further clarity, if there are no amendments or updates to the then-current Development Plan that are applicable in a Fiscal Year, Advaccine's sole responsibility under this Section 4.3 during such Fiscal Year shall be to inform Inovio that the then-current Development Plan is up to date. Advaccine shall be solely responsible for all decisions regarding the day-to-day conduct of Development within the Advaccine Territory.

4.4 Other Development Activities.

(a) Pre-Clinical Development. Upon prior written consent from Inovio, Advaccine may conduct pre-clinical studies to generate and obtain Data that is reasonably useful for the Development of any Product in the Field in the Advaccine Territory, provided that Advaccine shall promptly amend the Development Plan to include such pre-clinical studies and submit such amendment to the JSC for review.

(b) Clinical Development. If Advaccine wishes to conduct any Clinical Trials for the Development of any Product in the Field other than as set forth in the First Supplemental Development Plan in the Advaccine Territory, Advaccine may propose an amendment to the Development Plan to include such Clinical Trials and submit such amendment to the JSC for review and approval. If and upon receipt of such proposal, the JSC shall promptly (but in any event within thirty (30) days) review and decide on whether to approve such proposal. Upon the JSC's approval of such amendment, such Clinical Trials shall be included in the amended Development Plan and Advaccine may conduct such Clinical Trials at its own cost. Advaccine shall ensure that any Clinical Trials conducted in the Advaccine Territory, whether by itself or through a subcontractor pursuant to Section 4.9, are conducted only at medical facilities that are qualified and registered with the NMPA or any other applicable Regulatory Authority. For clarity, Advaccine shall not conduct any Clinical Trials of any Product outside of the Field.

(c) Cooperation. As agreed to between the Parties, Inovio may provide such technical assistance and cooperation to Advaccine as Advaccine may reasonably request, at Advaccine's sole cost and expense, as necessary or reasonably useful for Advaccine to Develop or Commercialize the Products in the Field in the Advaccine Territory.

4.5 Development Records. Advaccine shall maintain complete, current and accurate records of all activities (and all Data and other Information resulting from such activities) conducted with respect to Products by Advaccine, its Affiliates and their respective Sublicensees in the Advaccine Territory. Such records shall fully and properly reflect all work done and results achieved in the performance of the Development activities in good scientific manner appropriate for regulatory and patent purposes. Advaccine shall document all non-clinical studies and Clinical Trials for the Products in formal written study records according to applicable Laws, including applicable national and international guidelines such as ICH, GCP and GLP, and shall, at Inovio's reasonable request, provide Inovio English translations thereof (to the extent prepared and originated in a language other than English) at Inovio's sole cost and expense. Subject to provisions in Section 4.8, Inovio shall have the right to review and copy such records at reasonable times and to obtain access to the original to the

extent necessary or useful for regulatory or patent purposes and for legal proceedings in accordance with this Agreement.

4.6 Development Reports. Advaccine shall keep Inovio reasonably informed as to the progress and results of Advaccine's, its Affiliates' and their respective Sublicensees' Development activities (including prompt reporting of available clinical Data). Without limiting the foregoing, at each regularly scheduled JSC meeting, Advaccine shall provide Inovio with a reasonably detailed written report summarizing its Development activities performed since the last JSC meeting and the results thereof, as reasonably sufficient to enable Inovio to determine Advaccine's compliance with its diligence obligations under Section 4.1; provided that, even if the JSC does not hold a meeting in one or more Calendar Quarters, Advaccine shall provide such written report to Inovio at least once every Calendar Quarter. At such JSC meeting, the Parties shall discuss the status, progress and results of Advaccine's, its Affiliates' and their respective Sublicensees' Development activities. Advaccine shall promptly respond to Inovio's reasonable questions or requests for additional information relating to such Development activities. In addition, within thirty (30) days after the end of each Fiscal Year, Advaccine shall provide Inovio with a detailed written annual report regarding the progress of its Development activities and any results therefrom.

4.7 Data Exchange. In addition to Inovio's obligation with respect to the transfer of Inovio Licensed Know-How set forth under Section 2.6 and each Party's adverse event and safety Data reporting obligations pursuant to Section 5.8, but subject to the remainder of this Section 4.7 and Section 4.8, each Party shall, at its sole cost and expense, promptly provide the other Party with copies of any Data and Regulatory Materials related to the Vaccine or the Products generated by or on behalf of such Party or its Affiliates or Sublicensees in the performance of Development activities hereunder that would be reasonably necessary for the Development, Manufacture and Commercialization of the Vaccine or the Products in the Field in the other Party's respective territory (the "**Product Materials**"). The JSC may establish reasonable policies to effectuate the exchange of additional Product Materials between the Parties. Advaccine shall have the right to use the data provided by Inovio hereunder for the purpose of obtaining and maintaining Regulatory Approval for and Commercializing the Product in the Field in the Advaccine Territory. Inovio shall have the right to use the data provided by Advaccine hereunder for the purpose of obtaining and maintaining Regulatory Approval for and Commercializing the Product in the Inovio Territory.

4.8 Clinical Trial Data. The Parties acknowledge and agree that certain government approval or filing may be required in the Advaccine Territory before certain Data generated from the Clinical Trials in the Advaccine Territory may be provided to or otherwise made available to Inovio or its designee. The Parties agree to use their Commercially Reasonable Efforts to collaborate with each other and with Third Parties in obtaining such approval or filing in the most efficient manner as permitted by the applicable Laws.

4.9 Subcontractors. Advaccine, upon prior express written consent from Inovio, shall have the right to engage subcontractors to conduct any activities necessary for Development or Manufacturing (subject to the terms of Article 7) of the Products, including but not limited to non-clinical studies, Clinical Trials, CMC activities, and regulatory services for the Products, under this Agreement, provided that such subcontractors (a) are bound by written obligations of confidentiality,

non-use and compliance with applicable Laws, including Proper Conduct Practices, consistent with this Agreement and have agreed in writing to assign to Advaccine all Data, Information, inventions or other intellectual property generated by such subcontractor in the course of performing such subcontracted work, (b) are capable of producing Data (including non-clinical Data, clinical Data and CMC Information, as applicable) acceptable to the NMPA, the FDA and the EMA (and other applicable Regulatory Authorities in the Advaccine Territory, the United States or the European Union) and (c) as applicable, with respect to matters covered by Article 7, meet the specifications and requirements thereunder. Advaccine shall remain responsible for any obligations that have been delegated or subcontracted to any subcontractor, and shall be responsible for the performance of its subcontractors.

Article 5.

Regulatory Matters

5.1 Regulatory Responsibilities.

(a) Subject to the terms and conditions of this Agreement, Advaccine will be responsible, at its sole cost and expense, for the conduct of all regulatory activities required to obtain and maintain Regulatory Approval of the Products (including the Inovio Device and the Arrays for use in connection with the Products) in the Field in the Advaccine Territory, including the preparation and submission of all Regulatory Materials and all communications and interactions with Regulatory Authorities, as necessary to obtain Regulatory Approval for the Products in any Region in the Field in the Advaccine Territory. Advaccine shall be responsible for filing each CTA in the Field in the Advaccine Territory for each Product. Advaccine shall be responsible for filing each MAA in the Field in the Advaccine Territory for each Product in Advaccine's name. The Development Plan shall include the regulatory strategy for obtaining Regulatory Approval of the Products in the Field in the Advaccine Territory. Advaccine shall use Commercially Reasonable Efforts to carry out its regulatory obligations for the Products pursuant to such strategy.

(b) Inovio shall provide all reasonable assistance and cooperation to Advaccine as Advaccine may reasonably request, at Advaccine's sole cost and expense, during the Term of this Agreement, with respect to the satisfaction of its obligations under Section 5.1(a), including (i) in connection with the preparation of Regulatory Materials, (ii) (A) making available competent personnel to attend regulatory meetings or join such meetings by teleconference and (B) providing documentation within Inovio's possession and control, in each case as requested by Regulatory Authorities at Advaccine's cost, and (iii) providing Advaccine with additional Product Materials in the Inovio Territory as requested by Regulatory Authorities in the Advaccine Territory within a reasonable timeframe commensurate with the volume of Advaccine's reasonable request. In the event that Inovio believes that such requests are not reasonable or are otherwise burdensome to Inovio, then such matter shall be promptly submitted to the JSC for review and discussion.

5.2 Regulatory Information Sharing. Advaccine shall (a) provide Inovio with the original documents (in the electronic format in which it has been prepared by Advaccine) of draft package inserts, CTA and CTD, and, at Inovio's request, together with English translations (to the extent originated by Advaccine in Chinese), for Inovio's review and comment, in connection with obtaining or maintaining any MAA approval for the Products in the Field in the Advaccine Territory, prior to the submission of such documents to the Regulatory Authority in the Advaccine Territory; and (b) shall

keep Inovio informed of any material verbal or written communication or question relating to the Products received by Advaccine from the Regulatory Authority in the Advaccine Territory. Except as required by applicable Law, (i) Advaccine, its Affiliates and Sublicensees shall not submit any Regulatory Materials to, or communicate with, any Regulatory Authority in the Inovio Territory regarding any Products. If such submission or communication is required by applicable Law, Advaccine shall, if legally permitted, promptly notify Inovio in writing of such requirement and the content of such submission or communication; (ii) except to the extent in connection with the exercise of its retained rights under Section 2.1(b), Inovio, its Affiliate and Sublicensees shall not submit any Regulatory Materials to, or communicate with, any Regulatory Authority in the Advaccine Territory regarding any Products. If such submission or communication is required by applicable Law, Inovio shall, if legally permitted, promptly notify Advaccine in writing of such requirements and the content of such submission or communication.

5.3 Meetings with Regulatory Authorities. Advaccine shall lead all interactions with Regulatory Authorities in the Advaccine Territory with respect to the Products for use in the Field. Advaccine shall keep Inovio reasonably informed of any material regulatory developments related to the Products in the Field in the Advaccine Territory. At each regularly scheduled JSC meeting, Advaccine shall provide Inovio with a list and schedule of any in-person meeting or teleconference with the applicable Regulatory Authorities (or related advisory committees) in the Advaccine Territory planned for the next Calendar Quarter that relates to any Product in the Field. In addition, Advaccine shall notify Inovio as soon as reasonably possible (but in no event later than two (2) Business Days if possible) after Advaccine becomes aware of any additional such meetings or teleconferences that become scheduled for such Calendar Quarter. Inovio shall provide all assistance and documentation reasonably requested by Advaccine to prepare for any such meeting or teleconference, including making available competent personnel to attend any such meeting or teleconference at Advaccine's reasonable request (subject to reimbursement by Advaccine of Inovio's costs and expenses with respect thereto). To the extent permitted by applicable Laws and by the Regulatory Authorities (as reasonably determined by Advaccine), Inovio shall have the right to participate (whether directly or through a representative) in all such meetings and teleconferences, at Inovio's cost.

5.4 Regulatory Costs. Unless otherwise provided in this Agreement, Advaccine shall be responsible for the costs and expenses incurred in connection with the preparation and filing of any and all Regulatory Materials and the maintenance of any and all Regulatory Approvals (including MAA approvals) for the Products in the Field in the Advaccine Territory.

5.5 Right of Reference to Regulatory Materials. Each Party hereby grants to the other Party the right of reference to all Regulatory Materials pertaining to the Products submitted by or on behalf of such Party, subject to provisions in Section 4.8. The receiving Party may use such right of reference solely for the purpose of seeking, obtaining and maintaining Regulatory Approval of the Products in its respective territory. Each Party shall support the other Party, as reasonably requested by such other Party and at such other Party's expense, in obtaining Regulatory Approvals in such other Party's territory, including providing necessary documents or other materials required by applicable Laws to obtain Regulatory Approval in such territory, all in accordance with the terms and conditions of this Agreement.

5.6 No Harmful Actions. If either Party believes that the other Party is taking or intends to take any action with respect to any Product that could reasonably be expected to have an Adverse Risk, whether in the Inovio Territory or in the Advaccine Territory, such Party may bring the matter to the attention of the JSC and the Parties shall discuss in good faith to promptly resolve such concern. Without limiting the foregoing, unless the Parties otherwise agree: (a) (i) Advaccine shall not communicate with any Regulatory Authority having jurisdiction outside the Advaccine Territory, unless so ordered by such Regulatory Authority, in which case Advaccine shall immediately notify Inovio of such order; and (ii) Advaccine shall not submit any Regulatory Materials or seek Regulatory Approvals for the Vaccine or the Product in the Inovio Territory; and (b) (i) except to the extent in connection with the exercise of its retained rights under Section 2.1(b), Inovio shall not communicate with any Regulatory Authority having jurisdiction outside the Inovio Territory, unless so ordered by such Regulatory Authority, in which case Inovio shall immediately notify Advaccine of such order; (ii) except to the extent in connection with the exercise of its retained rights under Section 2.1(b), Inovio shall not submit any Regulatory Materials or seek Regulatory Approvals for the Vaccine or the Product in the Advaccine Territory.

5.7 Notification of Threatened Action. Each Party shall immediately notify the other Party (including by providing notice to the other Party's Alliance Manager) of any information it receives regarding any threatened or pending action, inspection or communication by or from any Third Party, including without limitation a Regulatory Authority, which may affect the Development, Manufacture, Commercialization or regulatory status of any Product. Upon receipt of such information, the Parties shall consult with each other in an effort to arrive at a mutually acceptable procedure for taking appropriate action.

5.8 Adverse Event Reporting and Safety Data Exchange. No later than ninety (90) days before the Initiation of a Clinical Trial with respect to the Development of any Product in the Advaccine Territory, the Parties shall define and finalize the actions that the Parties shall employ with respect to such Product to protect patients and promote their well-being in a written pharmacovigilance agreement (the "**Pharmacovigilance Agreement**") for the Development of the Product globally. Further, no later than one hundred and eighty (180) days before the anticipated launch date of any Product in the Advaccine Territory, the Parties shall enter into a separate Pharmacovigilance Agreement for the Commercialization of the Product. Each of the Pharmacovigilance Agreements shall include mutually acceptable guidelines and procedures for the receipt, investigation, recording, communication, and exchange (as between the Parties) of adverse event reports, pregnancy reports, and any other information concerning the safety of the Product, and other routine pharmacovigilance reporting requirements. Such guidelines and procedures shall be in accordance with, and enable the Parties to fulfill, local and national regulatory reporting obligations under applicable Laws. Furthermore, such agreed procedure shall be consistent with relevant ICH guidelines, except where said guidelines may conflict with existing local regulatory reporting safety reporting requirement, in which case local reporting requirement shall prevail. The Pharmacovigilance Agreement shall provide for an adverse event database for the Products in the Field in the Advaccine Territory to be maintained by Advaccine at Advaccine's expense, and a global safety database for the Products to be maintained by Inovio at Inovio's expense. As between the Parties, Advaccine shall be responsible for preparing all adverse event reports and responses to safety issues and requests of Regulatory Authorities relating to the Products in the Field in the Advaccine Territory, and Advaccine shall be responsible for filing such

reports and responses with Regulatory Authorities in the Advaccine Territory. As between the Parties, Advaccine shall also be responsible for reporting any quality complaints, adverse events and safety data related to the Products in the Field in the Advaccine Territory to Inovio for inclusion in the global safety database. Each Party hereby agrees to comply with its respective obligations under such Pharmacovigilance Agreement and to cause its Affiliates and permitted Sublicensees to comply with such obligations.

5.9 Remedial Actions. Each Party will notify the other Party immediately, and promptly confirm such notice in writing, if it obtains information indicating that any Product may be subject to any recall, corrective action or other regulatory action taken by virtue of applicable Laws (a "**Remedial Action**"). The Parties will assist each other in gathering and evaluating such information as is necessary to determine the necessity of conducting a Remedial Action. Advaccine shall, and shall ensure that its Affiliates and Sublicensees will, maintain adequate records to permit the Parties to trace the packaging, labeling, distribution, sale and use (to the extent possible) of the Product in the Advaccine Territory. Advaccine shall have sole discretion with respect to any matters relating to any Remedial Action in the Advaccine Territory, including the decision to commence such Remedial Action and the control over such Remedial Action in its territory, at its cost and expense.

Article 6.

Commercialization

6.1 Overview; Diligence. Subject to the terms and conditions of this Agreement (including the diligence obligations set forth below), Advaccine shall have the sole right and responsibility for and have operational control over all aspects of the Commercialization of the Products in the Field in the Advaccine Territory, including: (a) developing and executing a commercial launch and pre-launch plan, (b) negotiating with applicable Governmental Authorities regarding the price and reimbursement status of the Products; (c) marketing, advertising and promotion; (d) booking sales and distribution and performance of related services; (e) handling all aspects of order processing, invoicing and collection, inventory and receivables; (f) providing customer support, including handling medical queries, and performing other related functions; and (g) conforming its practices and procedures to applicable Laws relating to the marketing, detailing and promotion of the Products in the Field in the Advaccine Territory. Advaccine shall bear all of the costs and expenses incurred in connection with such Commercialization activities. Advaccine shall use Commercially Reasonable Efforts to Commercialize the Products in the Advaccine Territory and to actively market and sell the Products in the Advaccine Territory and to expand annual Net Sales of the Products in the Advaccine Territory. Without limiting the generality of the foregoing, Advaccine shall use Commercially Reasonable Efforts to conduct its Commercialization activities under and in accordance with the Commercialization Plan.

6.2 Commercialization Plan.

(a) General. Advaccine shall Commercialize the Products in the Field in the Advaccine Territory pursuant to a commercialization plan (the "**Commercialization Plan**"). The Commercialization Plan shall include (i) a detailed description of all key strategic decisions (including messaging, branding, marketing, advertising, sales force positioning, number of representatives and details, pricing strategy, etc.), implementation tactics and pre-launch and post-launch activities; (ii) a reasonably detailed description and timeline of Advaccine's, its Affiliates' and their respective

Sublicensees' Commercialization activities for the Products in the Advaccine Territory for the next Fiscal Year, including medical marketing activities, sales forecasts and projections, pricing, reimbursement, market research, sales training, distribution channels, customer service and sales force matters related to the launch and sale of the Products in the Advaccine Territory, and (iii) a strategic plan for Commercialization of the Products in the Advaccine Territory for the following two (2) Fiscal Years. In the event that Advaccine's Commercialization Plan requires the use of Inovio internal resources to conduct additional activities, the extent of such need shall be clearly specified in the Commercialization Plan and will require the prior written approval of Inovio.

(b) Initial Plan and Amendments. Within a reasonable time (but no less than six (6) months) prior to the anticipated Regulatory Approval of each Product in the Advaccine Territory, Advaccine shall prepare and present to the JSC an initial Commercialization Plan for review and discussion (but not approval) by the JSC. From time to time (but at least on an annual basis) during the Term, Advaccine shall prepare updates and amendments, as appropriate, to the then-current Commercialization Plan (including to take into account changed circumstances that are material to the Commercialization of Product, including changes in the marketplace, relative success of the Product, and other relevant factors influencing such plan and activities), and shall submit all updates and amendments to the Commercialization Plan to the JSC for review and discussion (but not approval). Notwithstanding anything to the contrary contained in this Agreement, the Commercialization Plan, and any updates and amendments thereto, shall not require the approval of the JSC or Inovio.

6.3 Data Exchange. Advaccine shall keep Inovio reasonably informed of Advaccine's, its Affiliates' and their respective Sublicensees' Commercialization activities with respect to the Products in the Field in the Advaccine Territory. Inovio shall provide to Advaccine, upon Advaccine's request, and no more than once every six (6) months, at Inovio's cost, copies of any materials prepared by or on behalf of Inovio that are necessary or reasonably useful in connection with Advaccine's Commercialization of the Products in the Field in the Advaccine Territory (including relevant training materials, global brand and global market research, in each case, with respect to the Products), and, to the extent elected by Advaccine, Advaccine shall have the right to use such materials in connection with the Commercialization of the Products in the Field in the Advaccine Territory in accordance with the Agreement.

6.4 No Diversion. Each Party hereby covenants and agrees that it shall not, and shall ensure that its Affiliates and Sublicensees (in the case of Advaccine) or licensees, including Inovio Partners (in the case of Inovio) will not, directly or indirectly, promote, market, distribute, import, sell or have sold the Products, including via internet or mail order, in the other Party's territory. With respect to any country in the other Party's territory, a Party shall not, and shall ensure that its Affiliates and their respective Sublicensees (in the case of Advaccine) or licensees, including Inovio Partners (in the case of Inovio) will not: (a) establish or maintain any branch, warehouse or distribution facility for the Products in such countries, (b) knowingly engage in any advertising or promotional activities relating to the Products that are directed primarily to customers or other purchaser or users of the Products located in such countries, (c) actively solicit orders for the Products from any prospective purchaser located in such countries, or (d) knowingly sell or distribute the Products to any person in such Party's territory who intends to sell or has in the past sold the Products in such countries. If either Party receives any order for any Product from a prospective purchaser reasonably believed to be located in a country in the

other Party's territory, such Party shall immediately refer that order to the other Party and such Party shall not accept any such orders. Each Party shall not deliver or tender (or cause to be delivered or tendered) the Products into a country in the other Party's territory. Each Party shall not, and shall ensure that its Affiliates and their respective Sublicensees (in the case of Advaccine) or licensees, including Inovio Partners (in the case of Inovio) will not, knowingly restrict or impede in any manner the other Party's exercise of its retained exclusive rights in the other Party's territory. For the avoidance of doubt, nothing in this Section 6.4 shall limit Inovio's retained rights under Section 2.1(b).

6.5 Field Restrictions. Advaccine hereby covenants that it shall not, and shall cause its Affiliates and Sublicensees not to, promote or encourage the use of the Products in the Advaccine Territory for any use outside the Field.

Article 7.

MANUFACTURE AND SUPPLY

7.1 Clinical Supply.

(a) Clinical Inovio Device. During the Term, Inovio will supply Advaccine's clinical requirements of the applicable Inovio Device for clinical use in the Advaccine Territory, at Inovio's fully burdened manufacturing cost plus an agreed-to profit margin to support preclinical development and clinical studies in the Field in the Advaccine Territory. Upon Advaccine's reasonable request, the Parties agree to negotiate in good faith the terms and conditions of a supply of Inovio Device manufactured by or on behalf of Inovio under a separate agreement (the "**Clinical Supply Agreement**"). The Clinical Supply Agreement shall contain commercially reasonable terms as may be agreed upon in good faith by the Parties. Notwithstanding the foregoing, Advaccine shall have the right to Manufacture in the Advaccine Territory any Arrays used with the Inovio Device for use in the Field in the Advaccine Territory.

(b) Vaccine Supply. During the Term, Inovio will supply Advaccine's clinical requirements of the Vaccine for clinical use in the Advaccine Territory, at Inovio's fully burdened manufacturing cost plus an agreed-to profit margin to support preclinical development and clinical studies in the Field in the Advaccine Territory. Upon Advaccine's reasonable request, the Parties agree to negotiate in good faith the terms and conditions of a supply of the Vaccine manufactured by or on behalf of Inovio under a separate agreement.

(c) Vaccine Manufacturing Technology Transfer. Advaccine shall have the right to appoint additional or alternative suppliers (or conduct its own Manufacturing) of the applicable Vaccine for clinical use in the Advaccine Territory. Additionally, Inovio may elect to transfer Manufacturing responsibility for the Vaccine to Advaccine. Upon either Party's request, the Parties shall enter into a manufacturing technology transfer agreement ("**Clinical Manufacturing Technology Transfer Agreement**") as more fully detailed below. Under such Clinical Manufacturing Technology Transfer Agreement, Inovio shall transfer to Advaccine (or its designee) such documents and information, and provide such technical assistance and support, necessary or reasonably useful for Advaccine to Manufacture or have Manufactured the Vaccine or the Products, to the extent Controlled by Inovio as of such date; *provided* that (i) Advaccine shall notify Inovio of any such Third Party

contractor and shall not engage with such Third Party contractor if Inovio believes in good faith that such Third Party contractor is not capable of manufacturing the applicable Vaccine with sufficient quality to satisfy GMP requirements, and (ii) any such Third Party contractor shall (A) be bound by written obligations of confidentiality, non-use and compliance with applicable Laws (including Proper Conduct Practices, GMP and any regulations required by the NMPA, the FDA and the EMA), consistent with this Agreement and have agreed in writing to assign to Advaccine all Data, Information, inventions or other intellectual property generated by such subcontractor in the course of performing such subcontracted work, and (B) upon reasonable prior written notice given by Inovio to Advaccine, shall permit Inovio or its representatives to audit, during such subcontractor's normal business hours and without additional charge, the performance of Manufacturing activities hereunder, the facilities used and relevant processes, systems, books, documents and records, in order to determine Advaccine's compliance with this Agreement. Advaccine shall pay Inovio's reasonable external costs (including FTEs) incurred in connection with providing such information or assistance pursuant to this Section 7.1(c).

7.2 Commercial Supply.

(a) Commercial Inovio Device. During the Term, Inovio will supply Advaccine's commercial requirements of the applicable Inovio Device for commercial use in the Field in the Advaccine Territory, at Inovio's fully burdened manufacturing cost plus an agreed-to profit margin. Upon Advaccine's reasonable request, the Parties agree to negotiate in good faith the terms and conditions of a supply of Inovio Device manufactured by or on behalf of Inovio under a separate agreement (the "**Inovio Device Commercial Supply Agreement**"). The Inovio Device Commercial Supply Agreement shall contain commercially reasonable terms as may be agreed upon in good faith by the Parties. Notwithstanding the foregoing, Advaccine shall have the right to Manufacture Arrays used with the Inovio Device for use in the Field in the Advaccine Territory. Notwithstanding the foregoing, in the event that Inovio is unable to supply sufficient quantity of the Inovio Device pursuant to the Inovio Device Commercial Supply Agreement to meet at least eighty-five percent (85%) of Advaccine forecasted requirements of the Products in the Advaccine Territory for a period of six (6) consecutive months, then Inovio shall establish a second source supplier for the Inovio Device in order to Manufacture the Inovio Device for use in the Advaccine Territory for use with the Products.

(b) Manufacture and Supply. Advaccine assumes responsibility for the manufacture and supply of the Vaccine itself or through a contract manufacturer, for commercial use in the Field in the Advaccine Territory. Advaccine assumes responsibility for the manufacture and supply of any Arrays itself or through a contract manufacturer for use in the Field in the Advaccine Territory.

(c) Manufacturing Technology Transfer. In the event that neither Party has already initiated a technology transfer in accordance with Section 7.1(c), then, upon either Party's request, the Parties shall enter into a manufacturing technology transfer agreement for the applicable Vaccine in the manner set forth in Section 7.1(c). Advaccine shall pay Inovio's reasonable external costs incurred in connection with providing such information or assistance pursuant to this Section 7.2(c).

7.3 Distribution. Advaccine will be solely responsible for the distribution of the Products in the Field in the Advaccine Territory.

7.4 Brand Security and Anti-Counterfeiting. The Parties will establish contacts for communication regarding brand security issues, and each Party shall reasonably cooperate with the other Party with respect thereto. Practices around these incidents will comply with Inovio's then-current standards, where such standards define product security features, warehouse/cargo protection requirements, and response and communication process for such incidents.

Article 8.

Compensation

8.1 Upfront Payment. Within thirty (30) calendar days after the Effective Date, Advaccine shall pay to Inovio a one-time, non-refundable, non-creditable upfront payment of three million U.S. Dollars (US$3,000,000).

8.2 Development Milestone Payments. Advaccine shall pay to Inovio the one-time, non-refundable, non-creditable payments set forth in the table below. Advaccine shall notify Inovio in writing within ten (10) days of achievement by a Product of a regulatory milestone event (except for milestone No. 3, which Inovio shall notify Advaccine upon achievement) and Advaccine shall pay to Inovio the required milestone payment within thirty (30) Business Days of the achievement by a Product of the applicable milestone event.

No.	Milestone Event	Milestone Payment
1	Enrollment of first subject in first Phase 2 Clinical Trial or Pivotal Clinical Trial for the Product in the Advaccine Territory	[***]
2	Enrollment of first subject in first Phase 3 Clinical Trial or Pivotal Clinical Trial for the Product in the Advaccine Territory	[***]
3	Marketing Authorization for a Product in the Field in the U.S. by the FDA	[***]
4	Marketing Authorization for a Product in the Field by the NMPA	[***]
5	First Commercial Sale of a Product in the Advaccine Territory	[***]

If any development milestone event set forth above is achieved before any prior development milestone event, then such prior development milestone event(s) shall then also be due and payable together with the achieved development milestone event. For the avoidance of doubt, two or more development milestones may be achieved concurrently.

8.3 Commercial Milestone Payments. Advaccine shall pay to Inovio the additional one-time, non-refundable, non-creditable payments set forth in the table below within forty-five (45) Business Days after the Calendar Quarter in which the aggregate Net Sales of the Products sold in the Advaccine Territory in a Calendar Year of the corresponding threshold value indicated below is first achieved. For clarity, each of the following milestone payments shall be payable only once regardless of the number of times such milestone is achieved.

Commercial Milestone Event	Milestone Payment
The aggregate Net Sales of the Products in the Advaccine Territory in a given Calendar Year first reaches [***]	[***]
The aggregate Net Sales of the Products in the Advaccine Territory in a given Calendar Year first reaches [***]	[***]
The aggregate Net Sales of the Products in the Advaccine Territory in a given Calendar Year first reaches [***]	[***]
The aggregate Net Sales of the Products in the Advaccine Territory in a given Calendar Year first reaches [***]	[***]

8.4 Royalties on Net Sales.

(a) Royalty Rates. Subject to the terms and conditions of this Section 8.4, Advaccine shall pay to Inovio non-creditable, non-refundable royalties equal to [***] Net Sales of all Products in the Advaccine Territory on a Product-by- Product and Region-by-Region basis during the applicable Royalty Term.

(b) Royalty Term. Royalties payable under Section 8.4(a) shall be paid by Advaccine (on a Product-by-Product and Region-by-Region basis) from the period beginning on the date of the First Commercial Sale of each Product in a Region in the Advaccine Territory and continuing until the later of: (i) ten (10) years from the date of First Commercial Sale of such Product in such Region, and (ii) expiration of the last Valid Claim of an Inovio Licensed Patent Covering such Product in such Region (the "**Royalty Term**"). For clarity, if a Valid Claim of an Inovio Licensed Patent Covers the Manufacture of such Product in such Region, then regardless of whether such Product is actually Manufactured in such Region, such Product shall be deemed to be Covered by a Valid Claim of an Inovio Licensed Patent in such Region.

(c) Royalty Reduction.

i. **Biosimilar Entry**. If a Product is generating Net Sales in a Region during the applicable Royalty Term at a time when a Biosimilar Product with respect to such Product is being sold in such Region, and such Biosimilar Product(s) obtain (x) a market share of at least [***] in such Region on a volume basis, then, subject to Section 8.4(c)(iv), the royalty rates applicable to Net Sales of such Product in such Region shall be reduced to [***] of the royalty rate set forth in Section 8.4(a), or (y) a market share of at least [***] in such Region on a volume basis, then, subject to Section 8.4(c)(iv), the royalty rates applicable to Net Sales of such Product in such Region shall be reduced to [***] of the royalty rate set forth in Section 8.4(a), but in each case of (x) and (y) only for so long as the Biosimilar Product with respect to such Product is being sold in such Region with such market share.

ii**. Third Party Royalty Credit**. If Advaccine determines (based on advice of outside Patent counsel) that it is necessary to obtain a license to any Patent owned by a Third Party that contains claims that cover the Vaccine in a Region in the Advaccine Territory (i.e., but for such license, the making, having made, using, selling, offering for sale, or importing of the Vaccine, as

contained in or comprising a Product, would infringe such Patent owned by such Third Party in such Region) and Advaccine obtains such a license, then, subject to Section 8.4(c)(iv), Advaccine shall have the right to deduct, from the royalty payment that would otherwise be payable to Inovio pursuant to Section 8.4(a) with respect to Net Sales of such Product in such Region in a particular Calendar Quarter, an amount equal to [***] of the payments by Advaccine to such Third Party pursuant to such license on account of the sale of such Product in such Region during such Calendar Quarter; provided that (i) in no event will the royalty payment that would otherwise be payable to Inovio pursuant to this Section 8.4 with respect to Net Sales of such Product in such Region in such particular Calendar Quarter (without regard to any other reductions) be reduced by more than [***] in any given Calendar Quarter as a result of any deduction under this Section 8.4(c)(ii) and (ii) Advaccine will be entitled to carry forward to subsequent Calendar Quarters any amounts with respect to which Advaccine would have been entitled to take a deduction pursuant to this Section 8.4(c)(ii) but is unable to take such deduction pursuant to the foregoing sub-clause (i).

iii. **No Valid Claim**. For each Product and for any period during the Royalty Term in which the sale of such Product in a given country is neither: (i) Covered by any Valid Claim of an Inovio Licensed Patent or Joint Patent nor (ii) protected by any data exclusivity right applicable to such Product in such country, then the Royalty rate applicable to Net Sales of such Product in such country during such period shall be equal to [***] of the applicable Royalty rate set forth in this Section 8.4.

iv. Notwithstanding the foregoing, in no event shall the operation of Section 8.4(c)(i), Section 8.4(c)(ii) or Section 8.4(c)(iii)), individually or in combination, reduce the royalties paid to Inovio with respect to the Net Sales of any Product in any Region in the Advaccine Territory in any Calendar Quarter to less than [***] of the amount that would otherwise have been payable to Inovio pursuant to Section 8.4(a) with respect to such Net Sales.

8.5 Royalty Payments; Reports. Royalties under Section 8.4 shall be calculated and reported for each Calendar Quarter during the Royalty Term and shall be paid within thirty (30) Business Day after the end of the applicable Calendar Quarter, commencing with the Calendar Quarter in which the First Commercial Sale of a Product occurs. Each payment of royalties shall be accompanied by a report of Net Sales of the Products by Advaccine, its Affiliates and their respective Sublicensees in sufficient detail to permit confirmation of the accuracy of the royalty payment made, including: (a) the amount of gross sales and Net Sales of the Products in the Advaccine Territory on a Product-by-Product and Region-by-Region basis, (b) an itemized calculation showing the deductions from gross sales (by major category as set forth in the definition of Net Sales) to determine Net Sales, and (c) a calculation of the amount of royalties due to Inovio in U.S. Dollars, including the application of any exchange rate used.

8.6 Payment Method; Foreign Exchange; Blocked Payments. All payments owed by Advaccine under this Agreement shall be made by wire transfer in immediately available funds to a bank and account designated in writing by Inovio. For clarity, all payments by Advaccine to Inovio pursuant to Sections 8.1, 8.2, 8.3 and 8.4 shall be in U.S. Dollars. The rate of exchange to be used in computing the amount of currency equivalent in U.S. Dollars of any amounts payable in U.S. Dollars by Advaccine to Inovio under this Agreement shall be determined and calculated (i) with respect to the

Chinese Yuan, using the middle rate published by the Bank of China for exchange of US dollars with the Chinese Yuan on the date of transfer of the payment, and (ii) with respect to any other currency, the average rate of exchange based on OANDA rates for the Calendar Quarter in which the applicable payment is due. In the event that, by reason of applicable Laws in the Advaccine Territory, it becomes impossible or illegal for Advaccine or its Affiliate to transfer, or have transferred on its behalf, payments to Inovio, Advaccine shall promptly notify Inovio of the conditions preventing such transfer and such payments shall be deposited in local currency in the relevant country to the credit of Inovio in a recognized banking institution designated by Inovio.

8.7 Interest on Late Payments. If Inovio does not receive payment of any sum due to it on or before the due date, interest shall thereafter accrue on the sum due to Inovio until the date of payment at the per annum rate of [***] over the then-current prime rate reported in The Wall Street Journal or the maximum rate allowable by applicable Laws, whichever is lower, with such interest compounded quarterly.

8.8 Records; Audits.

(a) Advaccine shall, and shall cause its Affiliates and their respective Sublicensees to, maintain in accordance with Accounting Standards, reasonably complete and accurate records in sufficient detail to permit Inovio to confirm the accuracy of the calculation of royalty payments and the achievement of the milestone events. All payments and other relevant amounts under this Agreement shall be accounted for in accordance with Accounting Standards. Upon reasonable prior written notice, in any event no less than thirty (30) days prior written notice, such records shall be available for examination during regular business hours and in a manner that does not interfere with Advaccine's business activities for a period of three (3) years from the end of the Fiscal Year to which they pertain, and not more often than once each Fiscal Year, by an independent certified public accountant selected by Inovio and reasonably acceptable to Advaccine, for the sole purpose of verifying the accuracy of the financial reports furnished by Advaccine pursuant to this Agreement and any payments with respect thereto. Any such auditor shall not disclose Advaccine's Confidential Information, except to the extent such disclosure is necessary to verify the accuracy of the financial reports furnished by Advaccine or the amount of payments due under this Agreement. Any amounts shown to be owed but unpaid shall be paid within thirty (30) days from the accountant's report, plus interest (as set forth in Section 8.7) from the original due date. Inovio shall bear the full cost of such audit unless such audit discloses an underpayment by Advaccine of more than [***] of the amount due for the audited period, in which case Advaccine shall bear the full cost of such audit.

(b) Inovio shall, and shall ensure that its Affiliates and its and their respective employees, agents and contractors, maintain complete and accurate records with respect to Inovio's pharmacovigilance-related obligations set forth in Section 5.8. Upon reasonable prior notice, such records shall be available for examination during regular business hours for a period of three (3) years from the end of the Fiscal Year to which they pertain, and not more often than once each Fiscal Year, by Advaccine or its designee that is reasonably acceptable to Inovio, for the sole purpose of ensuring compliance with NMPA and other Regulatory Authority regulations. Any such records shall be deemed Confidential Information of Inovio.

8.9 Taxes.

(a) Taxes on Income. Except as set forth in this Section 8.9, each Party shall be solely responsible for the payment of all taxes imposed on its share of income arising directly or indirectly from the efforts of the Parties under this Agreement.

(b) Withholding Taxes. Subject to Section 8.9(d), if Advaccine is required by applicable Laws to make any tax deduction, tax withholding or similar payment (other than value-added tax, any goods and services tax, harmonized sales tax and any similar provincial sales tax) from any amount paid or payable by Advaccine to Inovio (a "**Tax Withholding**") under this Agreement, then in the case of any payments to be made by Advaccine to Inovio under this Agreement (including pursuant to Sections 8.1, 8.2, 8.3, and 8.4), Advaccine will (A) deduct and withhold the amount of such Tax Withholding for the account of Inovio to the extent required by applicable Laws (such amounts payable to Inovio shall be reduced by the amount of Tax Withholding deducted and withheld) and (B) pay any such Tax Withholding (including any additional Tax Withholding required with respect to Advaccine's additional payments under this Section 8.9) directly to the proper Governmental Authority.

(c) VAT. All payments due to Inovio from Advaccine pursuant to this Agreement shall be paid exclusive of, and without reduction for, any value-added tax (including, for greater certainty, any goods and services tax, harmonized sales tax and any similar taxes) ("**VAT**") (which, if applicable, shall be payable by Advaccine). Advaccine shall be responsible for the payment of all VAT applicable to the payments made by Advaccine to Inovio under this Agreement in the Advaccine Territory and shall file all applicable VAT tax returns or seek any exemption or reduction of such VAT pursuant to any applicable Laws. Inovio shall cooperate, to the extent reasonably required, with the filing of any such VAT tax returns or any application of reduction or exemption of such VAT with the proper Government Authority in the Advaccine Territory. Advaccine shall indemnify Inovio for any VAT imposed on Inovio in the Advaccine Territory with respect to the payments made to it by Advaccine under this Agreement and if Inovio directly pays any such VAT, Advaccine shall promptly reimburse Inovio for such VAT including all reasonable related costs. If Inovio determines that it is required to report any such tax, Advaccine shall promptly provide Inovio with applicable receipts and other documentation necessary or appropriate for such report. For clarity, this Section 8.9(c) is not intended to limit Advaccine's right to deduct VAT in determining Net Sales.

(d) Tax Cooperation. Without limiting Section 8.9(b) and 8.9(c), the Parties agree to cooperate with one another and use reasonable efforts to reduce or eliminate Tax Withholding or similar obligations in respect of payments made by Advaccine to Inovio under this Agreement (including pursuant to Sections 8.1, 8.2, 8.3 and 8.4). To the extent Advaccine is required to make any Tax Withholdings for any payment to Inovio, Advaccine shall pay the amounts of such taxes to the proper Governmental Authority in a timely manner and promptly transmit to Inovio an official tax certificate or other evidence of such withholding sufficient to enable Inovio to claim such payment of taxes from any applicable Government Authority. Inovio shall provide Advaccine any tax forms or other similar documentation that may be reasonably necessary in order for Advaccine not to make any Tax Withholdings or to make Tax Withholdings at a reduced rate under an applicable bilateral income tax treaty, and shall update such forms and documentation from time to time as necessary to reflect changes in facts. Each Party shall provide the other with reasonable assistance to enable the recovery, as permitted by applicable Laws, of Tax Withholdings, VAT or similar obligations resulting from payments made under this Agreement, such recovery to be for the benefit of the Party bearing such

withholding tax or VAT. Specifically, in the event that any tax has been withheld upon a payment made under this Agreement or has otherwise been remitted to a Governmental Authority, if requested by either Party, and if, and for so long as, the Parties acting in good faith mutually agree that there is a reasonable prospect of successfully obtaining a refund of such tax, then the other Party shall, at the requesting Party's sole cost and expense, seek a refund of such tax from the proper Governmental Authority. In the event that any taxes withheld or reimbursed by Advaccine under Section 8.9(a) are subsequently refunded to Advaccine by the appropriate Governmental Authority, Advaccine shall pay over the amount of such refund, less any cash Taxes attributable to the receipt thereof and any reasonable expenses incurred by Advaccine in obtaining such refund. Advaccine agrees to reasonably cooperate with Inovio and its Affiliates in the pursuit of such tax refund (including, if required by applicable Laws or by the applicable Governmental Authority, permitting Inovio to seek such tax refund in Advaccine's name and participating in any application or appeal that requires that Advaccine be the party applying for such tax refund, solely with Advaccine's prior written consent); provided that, Inovio agrees to assume responsibility for direct payment of lawyers' and other advisors' fees and any other costs associated with seeking such refund. Notwithstanding anything contained in the Agreement to the contrary, in the event that Inovio is unable to utilize any portion of a Tax Withholding as tax credit to effectively lower its income tax for the applicable tax year during which the applicable payment is received, Advaccine shall reimburse Inovio for any such portion thereof within forty-five (45) days after receipt of an invoice from Inovio (and shall gross-up Inovio for any Tax Withholding on such payment).

Article 9.

Intellectual Property Matters

9.1 Ownership; License Grants.

(a) Data Generated by Inovio. Inovio shall solely own all Data generated by Inovio. For clarity, all Data solely directed to the Vaccine and the Array Controlled by Inovio are included in the Inovio Licensed Know-How and licensed to Advaccine under Section 2.1(a).

(b) Data Generated by Advaccine. Advaccine shall solely own all Data generated by Advaccine in the Development of the Vaccine and the Products in the Field in the Advaccine Territory. Advaccine hereby grants to Inovio (i) an irrevocable, perpetual, royalty-free, fully paid-up, exclusive license, with the right to grant sublicenses, to use such Data generated and owned by Advaccine for the purpose of seeking and maintaining any Regulatory Approval for the Vaccine or the Product in the Inovio Territory, and (ii) upon expiration or termination of the Agreement (other than termination of the Agreement by Advaccine pursuant to Sections 13.4 or 13.5), an irrevocable, perpetual, royalty-free, fully paid-up, non-exclusive license, with the right to grant sublicenses, to use such Data generated and owned by Advaccine for the Development, Manufacture and Commercialization of the Vaccine or the Product in the Field in the Advaccine Territory.

(c) Product Materials. Subject to the terms and conditions of this Agreement, each Party hereby grants to the other Party a fully-paid up, royalty-free exclusive license, with the right to grant sublicenses under multiple tiers, to use Product Materials generated and owned by such Party, solely to the extent reasonably necessary for the Development, Manufacture (with respect to Advaccine, solely to the extent applicable under Section 7.2) and Commercialization of the Vaccine and the Product in the Field in the other Party's respective territory during the Term of this Agreement.

(d) Inventions. Inventorship of any Invention will be determined in accordance with the standards of inventorship and conception under U.S. patent laws.

i. **Inovio Inventions**. Any Invention generated, developed, conceived or reduced to practice (constructively or actually) solely by or on behalf of Inovio, its Affiliates and their respective licensees (including Inovio Partners), including their employees, agents and contractors ("**Inovio Inventions**") shall be solely and exclusively owned by Inovio. For clarity, any and all Inovio Inventions that are Controlled by Inovio and reasonably necessary for the Development, Manufacture and Commercialization of the Vaccine and the Product in the Field in the Advaccine Territory shall be included in the Inovio Technology licensed to Advaccine under Section 2.1(a), including any Patent rights therein.

ii. **Advaccine Inventions** . Any Inventions generated, developed, conceived or reduced to practice (constructively or actually) solely by or on behalf of Advaccine, its Affiliates and their respective Sublicensees, including their employees, agents and contractors ("**Advaccine Inventions**") shall be solely and exclusively owned by Advaccine. Advaccine shall disclose in writing to Inovio all Advaccine Inventions promptly following the generation, development, conception or reduction to practice thereof. Advaccine hereby grants Inovio (A) an irrevocable, perpetual, royalty-free, fully paid-up, exclusive license, with the right to grant sublicenses, under the Advaccine Inventions in the Inovio Territory, and (B) upon expiration or termination of this Agreement (other than termination of this Agreement by Advaccine pursuant to Sections 13.4 or 13.5) an irrevocable, perpetual, royalty-free, fully paid-up, non-exclusive license, with the right to grant sublicenses, under the Advaccine Inventions in the Advaccine Territory, in each case of (A) and (B), solely for the Development, Manufacture and Commercialization of the Vaccine or the Products in the Field.

iii. **Joint Inventions** . Any Invention generated, developed, conceived or reduced to practice (constructively or actually) jointly by or on behalf of Advaccine and Inovio, their Affiliates and respective Sublicensees, including their employees, agents and contractors ("**Joint Inventions**") shall be jointly owned by the Parties, and, subject to the licenses set forth in this Agreement, each Party may freely exploit such Joint Inventions without any duty to account to the other Party. Each Party shall disclose in writing to the other Party all Joint Inventions promptly following the generation, development, conception or reduction to practice thereof. Advaccine hereby grants Inovio an irrevocable, perpetual, royalty-free, fully paid-up, exclusive license, with the right to grant sublicenses, under its rights in such Joint Inventions (i) in the Inovio Territory, and (ii) upon termination of the Agreement (other than termination of the Agreement by Advaccine pursuant to Sections 13.4 or 13.5), in the Advaccine Territory, in each case of (i) and (ii), solely for the Development, Manufacture and Commercialization of the Vaccine or the Product in the Field. Inovio hereby grants Advaccine an irrevocable, perpetual, royalty-free, fully paid-up, exclusive license, with the right to grant sublicenses, under its rights in such Joint Inventions in the Advaccine Territory solely for the Development, Manufacture and Commercialization of the Vaccine or the Product in the Field.

(e) Affiliates, Sublicensees and Subcontractors. Each Party shall ensure that each of its Affiliates, Sublicensees and subcontractors under this Agreement has a contractual obligation to disclose to it all Data, Product Materials and Inventions generated, invented, discovered, developed,

made or otherwise created by them or their employees, agents or independent contractors, and to provide sufficient rights with respect thereto, so that each Party can comply with its obligations to the other Party under this Section 9.1.

9.2 Patent Prosecution.

(a) Definition. For the purpose of this Article 9, "prosecution" of Patents shall include, without limitation, all communication and other interaction with any patent office or patent authority having jurisdiction over a Patent application throughout the world in connection with any pre-grant proceedings and post-grant proceeding, including opposition proceedings.

(b) Inovio Licensed Patents; Joint Patents. Except as set forth in Section 9.2(d), as between the Parties, Inovio shall have the sole right to prepare, file, prosecute and maintain or abandon the Inovio Licensed Patents on a worldwide basis. Except as set forth in Section 9.2(d), as between the Parties, Inovio shall have the sole right to prepare, file, prosecute and maintain or abandon the Joint Patents on a worldwide basis. Inovio shall provide Advaccine with a copy of the draft prepared for the filing of a Joint Patent, before the filing of such Joint Patent and will consider in good faith comments thereto provided by Advaccine in connection with the filing thereof. Inovio shall, at the request of Advaccine, provide Advaccine with regular updates on the prosecution of the Inovio Product-Specific Licensed Patents and Joint Patents in the Field in the Advaccine Territory. For clarity, Advaccine shall not have any rights pursuant to this Agreement with respect to any Inovio Licensed Patents in the Inovio Territory (including any Step-In Rights relating thereto).

(c) Advaccine Patents. Except as set forth in Section 9.2(d), as between the Parties, Advaccine shall have the sole right to prepare, file, prosecute and maintain or abandon the Advaccine Patents. Advaccine shall provide Inovio with a copy of the draft prepared for the filing of a Advaccine Patent, before the filing of such Advaccine Patent and will consider in good faith comments thereto provided by Inovio in connection with the filing thereof. Advaccine shall provide Inovio with regular updates on the prosecution of the Advaccine Patents in the Field in the Advaccine Territory.

(d) Step-In Rights. Either Party may cease prosecution and/or maintenance of any Patent that such Party is responsible for prosecuting and maintain pursuant to this Section 9.2 on a country-by-country basis by providing the other Party written notice reasonably in advance of such due date. If the responsible Party elects to cease prosecution or maintenance of the relevant Patent in a country, the other Party, shall have the right, but not the obligation, at its sole discretion and cost, to continue prosecution or maintenance of such Patent and in such country ("**Step-In Rights**"), provided that Advaccine may only exercise its Step-In Rights with respect to Joint Patents and Inovio Product-Specific Licensed Patents in the Advaccine Territory. If the other Party elects to continue prosecution or maintenance or elects to file additional applications following the responsible Party's election to cease prosecution or maintenance pursuant to this Section 9.2(d), the responsible Party shall transfer the applicable patent files to such other Party or its designee and execute such documents and perform such acts at the responsible Party's expense as may be reasonably necessary to allow the other Party to initiate or continue such filing, prosecution or maintenance at the other Party's sole expense.

(e) Cooperation. Each Party shall provide the other Party with all reasonable assistance and cooperation in the patent prosecution efforts set forth in this Section 9.2, including

providing any necessary powers of attorney and executing any other required documents or instruments for such prosecution.

9.3 Patent Term Extensions in the Advaccine Territory. The JSC will discuss and recommend for which, if any, of the Patents within the Inovio Licensed Patents, Advaccine Patents and Joint Patents in the Advaccine Territory the Parties should seek patent term extensions. If after reasonable discussion and good faith consideration of each Party's view on a particular matter before the JSC, the representatives of the Parties cannot reach an agreement as which Patents such extensions should be sought for, (a) Inovio, in the case of Inovio Licensed Patents and Joint Patents, and (b) Advaccine, in the case of Advaccine Patents, shall have the final decision-making authority with respect to applying for any such patent term extension in the Advaccine Territory, and will act with reasonable promptness in light of the development stage of the Products to apply for any such patent term extension, where it so elects; provided, however, that if only one such Patent can obtain a patent term extension, the Parties will consult in good faith to determine which such Patent should be the subject of efforts to obtain a patent term extension, and *further provided* that, if an Inovio Licensed Patent is the only Patent that is eligible for a patent term extension with respect to a Product in the Advaccine Territory, then (i) Advaccine shall have the right, but not the obligation, to request Inovio to apply for such patent term extension at Advaccine's sole discretion and cost, and (ii) upon Inovio's receipt of such request, Inovio shall use Commercially Reasonable Efforts to apply for such patent term extension. Each Party will cooperate fully with the other Party in making such filings or actions, for example and without limitation, making available all required regulatory Data and Information and executing any required authorizations to apply for such patent term extension. All expenses incurred in connection with activities of each Party with respect to the Patent(s) for which such Party seeks patent term extensions pursuant to this Section 9.3 shall be borne by such Party.

9.4 Patent Enforcement.

(a) Notification; Information Sharing. If either Party becomes aware of any existing or threatened infringement of any Inovio Licensed Patent, Advaccine Patent or Joint Patent ("**Infringement**"), it shall promptly notify the other Party in writing to that effect and the Parties will consult with each other regarding any actions to be taken with respect to such Infringement. Each Party shall share with the other Party all Information available to it regarding such alleged Infringement, pursuant to a mutually agreeable "common interest agreement" executed by the Parties under which the Parties agree to their shared, mutual interest in the outcome of any suit or other action to enforce the Inovio Licensed Patents, Advaccine Patent and Joint Patent against such Infringement.

(b) Enforcement Rights.

i. **Inovio Product-Specific Licensed Patents; Joint Patents**.

(1) Inovio shall have the first right, but not the obligation, to bring an appropriate suit or other action against any Person engaged in the Infringement of any Inovio Product-Specific Licensed Patent or Joint Patent in the Advaccine Territory, at Inovio's cost and expense. If Inovio elects to commence a suit or other action to enforce the applicable Inovio Product-Specific Licensed Patent or Joint Patent against such Infringement in the Advaccine Territory, then Advaccine shall have the right to join such enforcement action upon written notice to Inovio, and the

Parties shall share the cost and expense of such enforcement action equally. If Inovio notifies Advaccine in writing that it does not intend to commence a suit or other action to enforce the applicable Inovio Product-Specific Licensed Patent or Joint Patent against such Infringement or to take other action to secure the abatement of such Infringement, or fails to take any such action after a period of forty-five (45) Business Days following either Party's receipt of the notice of Infringement pursuant to Section 9.4(a), then, to the extent that such Infringement is resulting from a Third Party's use or sale of a product that competes with a Product in the Field in the Advaccine Territory, Advaccine shall have the right, but not the obligation, to commence such a suit or take such action, at Advaccine's sole cost and expense; provided that, in the event the Person engaged in the Infringement of any Inovio Product-Specific Licensed Patent or Joint Patent in the Advaccine Territory is also engaged in such Infringement in the Inovio Territory, and Inovio has commenced a suit to secure the abatement of such Infringement in the Inovio Territory, then Inovio shall promptly notify Advaccine thereof and Advaccine shall not have the right to commence such suit or action without the prior written consent of Inovio, not to be unreasonably withheld. In such case, Inovio shall take appropriate actions in order to enable Advaccine to commence a suit or take the actions set forth in the preceding sentence.

(2) Neither Party shall settle any such suit or action under Section 9.4(b)(i)(1) in any manner that would negatively impact the Inovio Product-Specific Licensed Patents or Joint Patents or that would limit or restrict the ability of Advaccine to sell the Products in the Advaccine Territory, without the prior written consent of the other Party. For clarity, Advaccine shall not have the right to commence any such suit or action against any existing or threatened infringement of the Inovio Product-Specific Licensed Patents or Joint Patents outside the Advaccine Territory.

ii. **Advaccine Patents**. Advaccine shall have the first right, but not the obligation, to bring an appropriate suit or other action against any Person engaged in the Infringement of any Advaccine Patent, at Advaccine's cost and expense. If Advaccine elects to commence a suit to enforce the applicable Advaccine Patent against such Infringement, where such Infringement relates to the Commercialization in the Advaccine Territory of unauthorized products containing the Vaccine, then Inovio shall have the right to join such enforcement action upon notice to Advaccine, and in this case the Parties shall share the cost and expense of such enforcement action equally. If Advaccine notifies Inovio that it does not intend to commence a suit to enforce the applicable Advaccine Patent against such Infringement or to take other action to secure the abatement of such Infringement, or fails to take any such action after a period of ninety (90) days, then Inovio shall have the right, but not the obligation, to commence such a suit or take such action, at Inovio's cost and expense. In such case, Advaccine shall take appropriate actions in order to enable Inovio to commence a suit or take the actions set forth in the preceding sentence.

(c) Collaboration. Each Party shall provide to the Party bringing a claim, suit or action under Section 9.4(b) (the "**Enforcing Party**") with reasonable assistance in such enforcement, including joining such action as a party plaintiff if required by applicable Laws to pursue such action. The Enforcing Party shall keep the other Party regularly informed of the status and progress of such enforcement efforts, and shall reasonably consider the other Party's comments on any such efforts. The non-enforcing Party shall be entitled to separate representation in such matter by counsel of its own choice and at its own expense, but such Party shall at all times cooperate fully with the Enforcing Party.

(d) Expenses and Recoveries. The Enforcing Party shall be solely responsible for any expenses it incurs as a result of such enforcement action, except that the Parties shall share equally the cost and expense of the enforcement action when Inovio is the Enforcing Party and Advaccine elects to join the enforcement action. If the Enforcing Party recovers monetary damages in such claim, suit or action brought under Section 9.4(b), such recovery shall be allocated first to the reimbursement of any documented expenses incurred by the Parties in such enforcement action, and any remaining amounts shall be shared by the Parties as follows:

i. if (A) Inovio is the Enforcing Party under Section 9.4(b)(i)(1) and Advaccine elects to join the enforcement action and share the cost and expenses related thereto, or (B) Advaccine is the Enforcing Party under Section 9.4(b)(ii) and Inovio elects to join the enforcement action and share the cost and expenses related thereto: [***] of the remaining amounts shall be retained by Inovio, and [***] of the remaining amounts shall be paid to Advaccine;

ii. if Inovio is the Enforcing Party (A) under Section 9.4(b)(i)(1) and Advaccine does not elect to join the enforcement action and share the cost and expenses related thereto, or (B) under Section 9.4(b)(ii): [***] of the remaining amounts shall be retained by Inovio, and [***] of the remaining amounts shall be paid to Advaccine;

iii. if Advaccine is the Enforcing Party (A) under Section 9.4(b)(ii) and Inovio does not elect to join the enforcement action and share the cost and expenses related thereto, or (B) under Section 9.4(b)(i)(1): [***] of the remaining amounts shall be retained by Advaccine, and [***] of the remaining amounts shall be paid to Inovio.

(e) Sections 9.4(c) and 9.4(d) shall survive the termination of this Agreement solely with respect to any pending enforcement action initiated during the Term under this Section 9.4.

9.5 Third Party Infringement Claims. If the Manufacture, use or sale of the Products in the Field in the Advaccine Territory pursuant to this Agreement results in a claim, suit or proceeding alleging patent infringement against Inovio or Advaccine (or their respective Affiliates, licensees or Sublicensees) (collectively, "**Infringement Actions**"), such Party shall promptly notify the other Party hereto in writing. Subject to Article 11, the Party for which the Infringement Action is brought against (the "**Accused Party**") shall have the right to direct and control the defense of such Infringement Action, at its own expense with counsel of its choice; *provided, however,* that the other Party may participate in the defense and/or settlement thereof, at its own expense with counsel of its choice. In any event, the Accused Party agrees to keep the other Party reasonably informed of all material developments in connection with any such Infringement Action for which the Accused Party exercises its right to direct and control the defense. The Accused Party agrees not to settle such Infringement Action, or make any admissions or assert any position in such Infringement Action, in a manner that would adversely affect the rights or interests of the other Party, without the prior written consent of the other Party, which shall not be unreasonably withheld or delayed. Subject to Article 11, if the Accused Party does not exercise its right to direct and control the defense of an Infringement Action that is brought against the other Party, then the other Party shall have such right and it shall agree to keep the Accused Party reasonably informed of all material developments in connection with such Infringement Action and it shall not settle such Infringement Action, or make any admissions or assert

any position in such Infringement Action, in a manner that would materially adversely affect the rights or interests of the Accused Party, without the prior written consent of the Accused Party, which shall not be unreasonably withheld or delayed.

9.6 Trademarks.

(a) Subject to Section 9.6(c) below, Advaccine shall Commercialize the Products in the Field in the Advaccine Territory under any trademark owned or Controlled by Advaccine (the "**Advaccine Product Mark**"); provided that, prior to finalizing any Advaccine Product Mark, Advaccine shall provide Inovio with such proposed trademark and related trade dress and shall reasonably consider in good faith Inovio's comments with respect thereto. Advaccine shall, and shall cause its Affiliates and Sublicensees to, use the Advaccine Product Mark solely in connection with the Development, Manufacturing, and Commercialization of the Products in the Field in the Advaccine Territory. Advaccine shall own all rights in the Advaccine Product Mark, and all goodwill in the Advaccine Product Mark shall accrue to Advaccine. Advaccine shall register and maintain, at Advaccine's cost and expense, the Advaccine Product Marks in the Advaccine Territory.

(b) Subject to Section 9.6(c) below, Advaccine shall have the right to brand the Products in the Field in the Advaccine Territory with those trademarks of Advaccine that are associated with Advaccine's name or identity ("**Advaccine Housemarks**"). Advaccine shall own all rights in the Advaccine Housemarks, and all goodwill in the Advaccine Housemarks shall accrue to Advaccine.

(c) In connection with Advaccine's use of any Advaccine Product Mark or Advaccine Housemark, subject to Section 9.6(d), Advaccine shall not, and shall cause its Affiliates and their respective Sublicensees to not make any use of trademarks that are confusingly similar to any trademarks or housemarks of Inovio or its Affiliates (including the corporate name of Inovio or any of its Affiliates), without the prior written consent of Inovio.

(d) Notwithstanding anything to the contrary, to the extent required by applicable Laws, (i) Advaccine may include Inovio's name and corporate logo on the Product label, packaging, promotional/marketing materials to indicate that the Product is in-licensed from Inovio, and shall display Inovio's name and corporate logo with equal prominence and comparable size, resolution, print quality, and location, as instructed by Inovio from time to time, as Advaccine's name and corporate logo is displayed, and (ii) Inovio hereby grants to Advaccine a non-exclusive, fully paid-up, royalty free, sublicensable license to use Inovio's name and corporate logo solely for the Commercialization of the Product in the Field in the Advaccine Territory, to the extent consistent with the foregoing.

Article 10.

Representations And Warranties; covenants

10.1 Mutual Representations and Warranties. Each Party hereby represents and warrants to the other Party, as follows:

(a) Corporate Existence. As of the Effective Date, it is a company or corporation duly organized, validly existing, and in good standing under the Laws of the jurisdiction in which it is incorporated;

(b) Corporate Power, Authority and Binding Agreement. As of the Effective Date, (i) it has the corporate power and authority and the legal right to enter into this Agreement and perform its obligations hereunder; (ii) it has taken all necessary corporate action on its part required to authorize the execution and delivery of this Agreement and the performance of its obligations hereunder; and (iii) this Agreement has been duly executed and delivered on behalf of such Party, and constitutes a legal, valid, and binding obligation of such Party that is enforceable against it in accordance with its terms, subject to applicable bankruptcy, insolvency, reorganization, moratorium and similar Laws affecting creditors' rights and remedies generally;

(c) No Conflict. The execution and delivery of this Agreement, the performance of such Party's obligations in the conduct of the Development Plan and the license to be granted pursuant to this Agreement (i) do not and will not conflict with or violate any requirement of applicable Laws existing as of the Effective Date; (ii) do not and will not conflict with or violate the certificate of incorporation or by-laws (or other constating documents) of such Party; and (iii) do not and will not conflict with, violate, breach or constitute a material default under any contractual obligations of such Party or any of its Affiliates existing as of the Effective Date;

(d) No Violation. Neither such Party nor any of its Affiliates is under any obligation to any Person, contractual or otherwise, that is in violation of the terms of this Agreement or that would impede the fulfillment of such Party's obligations hereunder;

(e) No Debarment. Neither such Party nor any of its Affiliates is debarred or disqualified under the Act or comparable applicable Laws outside the U.S.; and

(f) No Consents. No authorization, consent, approval of a Third Party, nor to such Party's knowledge, any license, permit, exemption of or filing or registration with or notification to any court or Governmental Authority is or will be necessary for the (i) valid execution and delivery of this Agreement by such Party; or (ii) the consummation by such Party of the transactions contemplated hereby.

10.2 Additional Representations and Warranties of Inovio. Inovio represents and warrants to Advaccine, as of the Effective Date, as follows:

(a) License. Inovio (i) has the right to grant the license that it grants in Section 2.1(a); and (ii) has not granted, and will not grant during the Term, any right to any Third Party that would conflict with the License that it grants in Section 2.1(a) or rights granted to Advaccine hereunder;

(b) Notice of Infringement or Misappropriation. It has not received any written notice from any Third Party asserting or alleging that (i) any research, development, manufacture, or commercialization of a Product by Inovio prior to the Effective Date infringed or misappropriated the intellectual property rights of such Third Party, or (ii) the Development, Manufacture, or Commercialization of the Vaccine and the Products in the Advaccine Territory would infringe or misappropriate the intellectual property rights of such Third Party; to Inovio's actual knowledge, except as otherwise disclosed to Advaccine prior to the Effective Date, the Development, Manufacture or Commercialization of the Vaccine and theProducts does not infringe or misappropriate any intellectual property rights of any Third Party;

(c) Non-Infringement of Rights by Third Parties. To Inovio's actual knowledge, no Third Party is infringing or has infringed the Inovio Product-Specific Licensed Patents as of the Effective Date;

(d) Non-Assertion by Third Parties. To Inovio's actual knowledge, no Third Party has asserted in writing that the issued patents within the Inovio Licensed Patents set forth in **Exhibit A** are invalid or unenforceable;

(e) No Proceeding. There is no pending, and to Inovio's actual knowledge, no threatened, adverse action, suit or proceeding against Inovio involving any Inovio Technology or the safety (including any product liability claim) of a Product;

(f) Prosecution of Inovio Licensed Patents. Except with respect to any Inovio Product-Specific Licensed Patents for which Inovio has ceased prosecution and/or maintenance and granted Advaccine Step-In Rights therewith pursuant to Section 9.2(d), all maintenance fees, annuity payments, and similar payments relating to the Inovio Product-Specific Licensed Patents in the Advaccine Territory have been made, and during the Term will be made, in a timely manner. To Inovio's actual knowledge, prior to the Effective Date, Inovio has not taken action or failed to undertake an action, in connection with filing, prosecuting and maintaining the Inovio Product-Specific Licensed Patents set forth in **Exhibit A** in the Advaccine Territory in violation of any applicable Laws;

(g) Compliance with Laws. To Inovio's actual knowledge, Inovio has complied with all applicable Laws in connection with the prosecution of the Inovio Product-Specific Licensed Patents, including the duty of candor owed to any patent office pursuant to such Laws;

(h) Inovio Licensed Patents. Inovio does not have actual knowledge of any Information which leads it to believe that any issued patents included in the Inovio Licensed Patents set forth in **Exhibit A** are invalid or unenforceable; and

(i) No Conflicts. Inovio has not entered, and shall not enter, into any agreement with any Third Party that is in conflict with the rights granted to Advaccine under this Agreement, and has not taken and shall not take any action that would in any way prevent it from granting the rights granted to Advaccine under this Agreement, or that would otherwise materially conflict with or adversely affect Advaccine's rights under this Agreement.

10.3 Additional Representations and Warranties of Advaccine. Advaccine represents and warrants to Inovio that, to Advaccine's knowledge as of the Effective Date Advaccine does not Control any Patent that is necessary to make, use, import, offer for sale or sell the Products in the Field.

10.4 Compliance with Laws.

(a) Each Party shall, and shall ensure that its Affiliates and their respective Sublicensees will, comply in all respects with Proper Conduct Practices, and all applicable Laws (including all applicable Laws regarding data privacy) in the Development, Manufacturing, and Commercialization of the Products and performance of its obligations under this Agreement, including

the ICH, GCP, GLP and any Regulatory Authority and Governmental Authority health care programs having jurisdiction in such Party's respective territory, each as may be amended from time to time.

(b) Each Party shall immediately notify the other Party if it has any information or suspicion that there may be a violation of any applicable Laws (including Anti-Corruption Laws) in connection with its performance under this Agreement or the Development or Commercialization of any Product hereunder. In the event that either Party has violated or been suspected of violating any of its obligations, representations, warranties or covenants in Section 10.4(a), such Party will take reasonable actions to remedy such breach and to prevent further such breaches from occurring.

(c) Notwithstanding the foregoing, each Party will have the right, upon reasonable prior written notice and during the other Party's regular business hours, to audit the other Party's books and records in the event that a suspected violation of any Anti-Corruption Law needs to be investigated (in such Party's reasonable, good-faith discretion). Such audit shall be conducted by such Party's audit team comprised of qualified auditors who have received anticorruption training. For clarity, a credible finding, after a reasonable investigation, of any breach of Section 10.4(a) or 10.4(b) with respect to any Anti-Corruption Law, shall be deemed a material breach of this Agreement and allow the non-breaching Party to terminate this Agreement in accordance with Section 13.4.

10.5 Additional Covenants. In addition to any covenants made by Advaccine elsewhere in this Agreement:

(a) Advaccine hereby covenants to Inovio that neither Advaccine nor any of its Affiliates or Sublicensees, will employ or use the services of any Person who is debarred or disqualified under the Act, or comparable applicable Laws outside the U.S., in connection with activities relating to any Product; and in the event that Advaccine becomes aware of the debarment or disqualification or threatened debarment or disqualification of any Person providing services to Advaccine or any of its Affiliates with respect to any activities relating to any Product, Advaccine will immediately notify Inovio in writing and Advaccine will cease, or cause its Affiliate to cease (as applicable), employing, contracting with, or retaining any such Person to perform any services relating to any Product; and

(b) Each Party hereby covenants to the other Party that neither such Party nor any of its Affiliates, nor any of their respective employees shall use any confidential information obtained from any Third Party (including any prior employer) to which such Party or any of its Affiliates, or any of their respective employees has a duty to keep in confidence such information, directly or indirectly, whether obtained prior to the Effective Date or during the Term, in connection with activities performed under this Agreement, unless consented to in writing by such Third party, and such Party shall be solely responsible and liable for, and shall indemnify the other Party pursuant to Article 11 in connection with, any breach of this covenant by such Party, any of its Affiliates, or their respective employees.

10.6 No Other Representations or Warranties. EXCEPT AS EXPRESSLY STATED IN THIS AGREEMENT, NO REPRESENTATIONS OR WARRANTIES WHATSOEVER, WHETHER EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, NON-INFRINGEMENT OR NON-MISAPPROPRIATION OF THIRD PARTY INTELLECTUAL PROPERTY RIGHTS, ARE MADE OR GIVEN BY OR ON BEHALF OF A PARTY OR ITS AFFILIATES, AND ALL

REPRESENTATIONS AND WARRANTIES, WHETHER ARISING BY OPERATION OF LAW OR OTHERWISE, ARE HEREBY EXPRESSLY EXCLUDED. FOR CLARITY AND WITHOUT LIMITING THE FOREGOING, INOVIO MAKES NO REPRESENTATION OR WARRANTY CONCERNING THE PRODUCTS OR INOVIO TECHNOLOGY EXCEPT AS EXPRESSLY SET FORTH IN THIS ARTICLE 10.

Article 11.

Indemnification

11.1 Indemnification by Inovio. Inovio shall defend, indemnify, and hold Advaccine and its Affiliates and their respective officers, directors, employees, and agents (the "**Advaccine Indemnitees**") harmless from and against any and all losses, damages, liabilities, actually incurred expenses and costs, including reasonable legal expense and attorneys' fees ("**Losses**") to which any Advaccine Indemnitee may become subject as a result of any claim, demand, action or other proceeding by any Third Party (collectively, "**Claims**") arising out of, based on, or resulting from (a) the Development, Manufacture, or Commercialization of the Products in the Field in the Advaccine Territory by or on behalf of Inovio or its Affiliates prior to the Effective Date, (b) the Development, Manufacture, or Commercialization of the Products in the Inovio Territory, (c) the breach of any of Inovio's obligations under this Agreement, including Inovio's representations, warranties or covenants set forth herein, (d) the conduct of any pharmacovigilance-related activities set forth in Section 5.8 by or on behalf of Inovio (except to the extent that such Claim arises from Advaccine's provision of false, misleading, inaccurate or incomplete information to Inovio under Section 5.8 or Advaccine's breach of its obligations under the Pharmacovigilance Agreement) or (e) the willful misconduct or negligent acts of any Inovio Indemnitee. The foregoing indemnity obligation shall not apply to the extent that (i) the Advaccine Indemnitees fail to comply with the indemnification procedures set forth in Section 11.3 and Inovio's defense of the relevant Claim is materially prejudiced by such failure, or (ii) any Claim arises from, is based on, or results from any activity or occurrence for which Advaccine is obligated to indemnify the Inovio Indemnitees under Section 11.2.

11.2 Indemnification by Advaccine. Advaccine shall defend, indemnify, and hold Inovio and its Affiliates and their respective officers, directors, employees, and agents (the "**Inovio Indemnitees**") harmless from and against any and all Losses to which any Inovio Indemnitee may become subject as a result of any Claims arising out of, based on, or resulting from (a) the Development, Manufacture, or Commercialization of the Products by or on behalf of Advaccine or its Affiliates or Sublicensees on or after the Effective Date (except to the extent that any such activities are conducted by or on behalf of Inovio or its Affiliates) (including any Infringement Actions), (b) the breach of any of Advaccine's obligations under this Agreement, including Advaccine's representations, warranties, or covenants set forth herein, or (c) the willful misconduct or negligent acts of any Advaccine Indemnitee. The foregoing indemnity obligation shall not apply to the extent that (i) the Inovio Indemnitees fail to comply with the indemnification procedures set forth in Section 11.3 and Advaccine's defense of the relevant Claim is materially prejudiced by such failure, or (ii) any Claim arises from, is based on, or results from any activity or occurrence for which Inovio is obligated to indemnify the Advaccine Indemnitees under Section 11.1.

11.3 Indemnification Procedures. The Party claiming indemnity under this Article 11 (the "**Indemnified Party**") shall give written notice to the Party from whom indemnity is being sought (the "**Indemnifying Party**") promptly after learning of such Claim and shall offer control of the defense of such Claim to the Indemnifying Party. The Indemnified Party shall provide the Indemnifying Party with reasonable assistance, at the Indemnifying Party's expense, in connection with the defense of the Claim for which indemnity is being sought. The Indemnified Party may participate in and monitor such defense with counsel of its own choosing at its sole expense; *provided, however,* the Indemnifying Party shall have the right to assume and conduct the defense of the Claim with counsel of its choice. The Indemnifying Party shall not settle any Claim without the prior written consent of the Indemnified Party, not to be unreasonably withheld, unless the settlement involves only the payment of money. So long as the Indemnifying Party is actively defending the Claim in good faith, the Indemnified Party shall not settle or compromise any such Claim without the prior written consent of the Indemnifying Party. If the Indemnifying Party does not assume and conduct the defense of the Claim as provided above, (a) the Indemnified Party may defend against, consent to the entry of any judgment, or enter into any settlement with respect to such Claim in any manner the Indemnified Party may deem reasonably appropriate (and the Indemnified Party need not consult with, or obtain any consent from, the Indemnifying Party in connection therewith), and (b) the Indemnifying Party shall remain responsible to indemnify the Indemnified Party as provided in this Article 11. Notwithstanding anything contained in this Section 11.3, the provisions of Section 9.5 shall govern the defense of any Infringement Actions. Additionally, in the event that Inovio has elected to defend any such Infringement Action, then Advaccine shall not be obligated to indemnify Inovio for any Claims related to such Infringement Action; rather, the Parties shall share equal responsibility for any Losses resulting therefrom.

11.4 Limitation of Liability. NEITHER PARTY SHALL BE LIABLE TO THE OTHER PARTY FOR ANY SPECIAL, CONSEQUENTIAL, INCIDENTAL, PUNITIVE, OR INDIRECT DAMAGES ARISING FROM OR RELATING TO ANY BREACH OF THIS AGREEMENT, REGARDLESS OF ANY NOTICE OF THE POSSIBILITY OF SUCH DAMAGES. NOTWITHSTANDING THE FOREGOING, NOTHING IN THIS SECTION 11.4 IS INTENDED TO OR SHALL LIMIT OR RESTRICT THE INDEMNIFICATION RIGHTS OR OBLIGATIONS OF ANY PARTY UNDER SECTION 11.1 OR 11.2, OR DAMAGES AVAILABLE FOR A PARTY'S BREACH OF ITS EXCLUSIVITY OBLIGATIONS IN SECTION 2.5 OR ITS CONFIDENTIALITY OBLIGATIONS IN ARTICLE 12.

11.5 Insurance. Each Party shall procure and maintain insurance, including product liability insurance, adequate to cover its obligations hereunder and consistent with normal business practices of prudent companies similarly situated. It is understood that such insurance shall not be construed to create a limit of either Party's liability with respect to its indemnification obligations under this Article 11. Each Party shall provide the other Party with written evidence of such insurance upon request. Each Party shall provide the other Party with written notice at least thirty (30) days prior to the cancellation, nonrenewal or material change in such insurance.

Article 12.

Confidentiality

12.1 Confidentiality. Each Party agrees that, during the Term and for a period of ten (10) years thereafter, it shall keep confidential and shall not publish or otherwise disclose and shall not use for any purpose other than as provided for in this Agreement (which includes the exercise of any rights or the performance of any obligations hereunder or thereunder) any Confidential Information of the other Party, except to the extent expressly agreed in writing by the Parties. The foregoing confidentiality and non-use obligations shall not apply to any portion of the other Party's Confidential Information that the receiving Party can demonstrate by competent written proof:

(a) was already known to the receiving Party or its Affiliate, other than under an obligation of confidentiality, at the time of disclosure by the other Party;

(b) was generally available to the public or otherwise part of the public domain at the time of its disclosure to the receiving Party;

(c) became generally available to the public or otherwise part of the public domain after its disclosure and other than through any act or omission of the receiving Party or its Affiliate in breach of this Agreement;

(d) was disclosed to the receiving Party or its Affiliate without any confidentiality obligations by a Third Party who, to the Party's knowledge, had a legal right to make such disclosure and who did not obtain such information directly or indirectly from the other Party; or

(e) was independently discovered or developed by the receiving Party or its Affiliate without use of or reference to the other Party's Confidential Information, as evidenced by a contemporaneous writing.

12.2 Authorized Disclosure. Notwithstanding the obligations set forth in Section 12.1, a Party may disclose the other Party's Confidential Information and the terms of this Agreement to the extent:

(a) such disclosure is reasonably necessary (i) for the filing or prosecuting of Patent rights as contemplated herein; (ii) to comply with the requirements of Regulatory Authorities with respect to obtaining and maintaining Regulatory Approval of the Product; or (iii) for the prosecuting or defending litigation as contemplated herein;

(b) such disclosure is reasonably necessary to its or its Affiliate's employees, agents, consultants, contractors, licensees or Sublicensees, (including Inovio Partners) on a need-to-know basis for the sole purpose of performing its obligations or exercising its rights hereunder; provided that in each case, the disclosees are bound by written obligations of confidentiality consistent with those contained in this Agreement; or

(c) such disclosure is (i) reasonably necessary to comply with applicable Laws, including regulations or rules promulgated by applicable securities commissions (or other securities regulatory authorities), security exchanges (the "**Securities Regulators**", including without limitation to, the Securities and Futures Commission of Hong Kong, The Stock Exchange of Hong Kong Limited, the China Securities Regulatory Commission, the Shanghai Stock Exchange or the U.S. Securities and

Exchange Commission), court order, administrative subpoena or order; or (ii) at the request of applicable Securities Regulators, or reasonably anticipated by one Party that such disclosure will be required by applicable Laws or applicable Securities Regulators; and

(d) solely with respect to the terms of this Agreement and excluding disclosure of any other Confidential Information, such disclosure is reasonably necessary to any bona fide potential or actual investor, acquiror, merger partner, or other financial or commercial partner for the sole purpose of evaluating or carrying out an actual or potential investment, acquisition or other business relationship; provided that in connection with such disclosure, such Party shall inform each disclosee of the confidential nature of such Confidential Information and require each disclosee to treat such Confidential Information as confidential.

Notwithstanding the foregoing, in the event a Party is required to make a disclosure of the other Party's Confidential Information pursuant to Section 12.2(a), 12.2(c) or 12.2(d), such Party shall promptly notify the other Party of such required disclosure, to the extent that it is legally authorized or permitted to so, and shall use reasonable efforts to obtain, or to assist the other Party in obtaining, a protective order preventing or limiting the required disclosure.

12.3 Publicity; Terms of Agreement.

(a) The Parties agree that the existence or terms of this Agreement are the Confidential Information of both Parties, subject to the special authorized disclosure provisions set forth in this Section 12.3.

(b) If either Party desires to make a public disclosure concerning the existence or terms of this Agreement, such Party shall give the proposed text of such disclosure to the other Party reasonably in advance (but in any case no less than three (3) Business Days prior to the disclosure) for its prior review and approval (except as otherwise provided herein), which approval shall not be unreasonably withheld or delayed. A Party commenting on such a proposed disclosure shall provide its comments, if any, within three (3) Business Days after receiving the proposed disclosure for review (or such shorter period of time as necessitated by regulatory requirements). In addition, where required by applicable Laws, including regulations promulgated by applicable security exchanges, either Party shall have the right to make a press release or other public disclosure regarding the achievement of each milestone under this Agreement as it is achieved, the achievements of Regulatory Approval in the Advaccine Territory as they occur, or the occurrence of other events that affect either Party's rights or obligations under this Agreement, including the results of any Clinical Trial of the Products, whether in the Advaccine Territory or the Inovio Territory; provided that such Party shall provide the proposed text of such disclosure to the other Party at least one (1) Business Day in advance, and the other Party shall provide its comments thereto within such one (1) Business Day. In relation to the other Party's review of such an announcement, such other Party may make specific, reasonable comments on such proposed press release within the prescribed time for commentary. Neither Party shall be required to seek the permission of the other Party to repeat any information regarding the terms of this Agreement that has already been publicly disclosed by such Party, or by the other Party, in accordance with this Section 12.3.

(c) The Parties acknowledge that either or both Parties or their Affiliates may be obligated to file under applicable Laws a copy of this Agreement with Governmental Authorities, including, without limitation, the U.S. Securities and Exchange Commission (the "**SEC**"). Each Party and its Affiliates shall be entitled to make such a required filing, provided that it requests confidential treatment of the commercial terms and sensitive technical terms hereof to the extent such confidential treatment is reasonably available. In the event of any such filing, each Party will provide the other Party with a copy of this Agreement marked to show provisions for which such Party or its Affiliate intends to seek confidential treatment and shall reasonably consider and incorporate the other Party's timely comments thereon to the extent consistent with the legal requirements, with respect to the filing Party or Affiliate, governing disclosure of material agreements and material information that must be publicly filed.

12.4 Technical Publication. Neither Party may publish peer reviewed manuscripts, or give other forms of public disclosure such as abstracts and presentations, of results of studies carried out under this Agreement or otherwise pertaining to the Development of the Vaccine or the Products in the Advaccine Territory, without the opportunity for prior review and comment by the other Party in accordance with this Section 12.4, except to the extent required by applicable Laws. A Party seeking publication shall provide the other Party the opportunity to review and comment on any such proposed publication at least five (5) calendar days for abstracts ten (10) calendar days for manuscripts prior to its intended submission for publication. The other Party shall provide the Party seeking publication with its comments in writing, if any, within three (3) calendar days for abstracts and seven (7) calendar days for manuscripts after receipt of such proposed publication. The Party seeking publication shall consider in good faith any comments thereto provided by the other Party and shall comply with the other Party's request to remove any and all of such other Party's Confidential Information from the proposed publication. Further, if Inovio reasonably determines and notifies Advaccine that a proposed publication is reasonably likely to result in Adverse Risk in the Inovio Territory, Advaccine shall not submit such publication unless and until the Parties agree to a proposal to mitigate such Adverse Risk. In addition, the Party seeking publication shall delay the submission for a period up to thirty (30) calendar days in the event that the other Party can demonstrate reasonable need for such delay for the preparation and filing of a patent application. If the other Party fails to provide its comments to the Party seeking publication within the specified time frame, such other Party shall be deemed to not have any comments, and the Party seeking publication shall be free to publish in accordance with this Section 12.4. The Party seeking publication shall provide the other Party a copy of the manuscript at the time of the submission. Each Party agrees to acknowledge the contributions of the other Party and its employees in all publications in accordance with scientific practices.

12.5 Equitable Relief. Each Party acknowledges that its breach of this Article 12 will cause irreparable harm to the other Party, which cannot be reasonably or adequately compensated in damages in an action at law. By reasons thereof, each Party agrees that the other Party shall be entitled, in addition to any other remedies it may have under this Agreement or otherwise, to preliminary and permanent injunctive and other equitable relief to prevent or curtail any actual or threatened breach of the obligations relating to Confidential Information set forth in this Article 12 by the other Party.

Article 13.

Term And Termination

13.1 Term. The term of this Agreement (the "**Term**") shall commence upon the Effective Date and, unless earlier terminated pursuant to this Article 13, shall remain in effect until the expiration of the Royalty Term on a Region-by-Region basis. Upon the expiration (but not early termination) of this Agreement, on a Region-by-Region basis, the licenses granted hereunder by Inovio to Advaccine shall become fully paid-up and royalty free; provided that such licenses shall thereafter be granted on a non-exclusive basis.

13.2 Termination by Advaccine. Advaccine may terminate this Agreement in its entirety for convenience upon (i) nine (9) months prior written notice to Inovio (if such notice is provided before the First Commercial Sale in any Region) or (ii) eighteen (18) months prior written notice to Inovio (if such notice is provided following the First Commercial Sale in any Region); *provided, however,* that in each case under (i) and (ii) Inovio may, in its discretion, upon prior written notice to Advaccine accelerate the effectiveness of such termination to the extent permitted by Law in the Advaccine Territory.

13.3 Termination by Inovio.

(a) Inovio may terminate this Agreement upon written notice to Advaccine, if Advaccine ceases all Development (including all regulatory activities) or all Commercialization of the Products (including through Sublicensees and contractors) in the Advaccine Territory for a period of nine (9) or more consecutive months, unless Development or Commercialization of the Products was prevented throughout such period by a force majeure for which Advaccine provided notice pursuant to Section 15.2 prior to or at the start of such period and that persisted throughout such period despite Advaccine's Commercially Reasonable Efforts to remove or mitigate it. Such termination shall go into effect on the date specified in the applicable termination notice. For clarity, a delay by Regulatory Authorities and/or a decision by Regulatory Authorities to suspend a Clinical Trial (e.g., a "regulatory hold") shall not give Inovio the right to terminate this Agreement under this Section 13.3(a), so long as Advaccine continues to use Commercially Reasonable Efforts to remove such regulatory hold.

(b) Inovio may terminate this Agreement in its entirety upon thirty (30) days' prior written notice to Advaccine, if Advaccine or its Affiliates or their respective Sublicensees (directly or indirectly, individually or in association with any other Person) challenges the validity, enforceability or scope of any Inovio Licensed Patent, unless during such thirty (30)-day period the subject challenge is permanently dismissed or withdrawn and is not thereafter reinstituted or continued; provided that in the event a Sublicensee of Advaccine initiates such challenge, Inovio may not terminate this Agreement if (i) Advaccine successfully causes such Sublicensee to abort such challenge within such thirty (30)-day period, or (ii) Advaccine (A) provides Inovio a written notice of its intent to terminate its sublicense with such Sublicensee within such thirty (30)-day period, and (B) successfully terminates such sublicense within such thirty (30)-day period.

(c) Inovio may terminate this Agreement in its entirety upon thirty (30) days' prior written notice to Advaccine, if the Ringpu License Agreement (as defined in the Non-exclusive License Agreement) is not executed in a form reasonably satisfactory to Inovio within thirty (30) days after the Effective Date.

13.4 Termination for Breach. Each Party shall have the right to terminate this Agreement in its entirety immediately upon written notice to the other Party if the other Party materially breaches its obligations under this Agreement and, after receiving written notice identifying such material breach in reasonable detail, fails to cure such material breach within ninety (90) (or thirty (30) days in case of failure to make a payment due under this Agreement for reasons other than that set forth in Section 8.6) days from the date of such notice; provided that, if either Party disputes (a) whether such material breach has occurred, or (b) whether the defaulting Party has cured such material breach, the Parties agree to resolve the dispute as expeditiously as possible under Article 14. It is understood and acknowledged that during the pendency of such a dispute, all of the terms and conditions of this Agreement shall remain in effect and the Parties shall continue to perform all of their respective obligations hereunder.

13.5 Termination Due to Bankruptcy. Either Party may terminate this Agreement if, at any time, the other Party files in any court or agency pursuant to any statute or regulation of any state, country or jurisdiction, a petition in bankruptcy or insolvency or for reorganization or for an arrangement or for the appointment of a receiver or trustee of that Party or of its assets, or if the other Party proposes a written agreement of composition or extension of its debts, or if the other Party is served with an involuntary petition against it, filed in any insolvency proceeding, and such petition is not dismissed within sixty (60) days after the filing thereof, or if the other Party proposes or becomes a Party to any dissolution or liquidation, or if the other Party makes an assignment for the benefit of its creditors (each, an "**Insolvency Event**").

13.6 Effect of Termination. Upon any termination of this Agreement, the following shall apply (in addition to any other rights and obligations under this Agreement with respect to such termination):

(a) Licenses. All licenses and other rights granted by Inovio to Advaccine under this Agreement shall terminate. Inovio shall have a reversion of all rights previously licensed to Advaccine hereunder for which the relevant licenses have terminated on a fully paid-up and royalty-free basis, itself or with or through an Affiliate or Third Party, to Develop and Commercialize the Products in the Field in the Advaccine Territory at Inovio's discretion.

(b) Wind-Down. Advaccine will (i) responsibly wind-down, in accordance with accepted pharmaceutical industry norms and ethical practices, any on-going Clinical Trials for which it has responsibility hereunder in which patient dosing has commenced or, (ii) unless if this Agreement is terminated by Advaccine pursuant to Sections 13.4 or 13.5, at Inovio's reasonable request, (A) transfer to Inovio of its designee such Clinical Trial to the extent permitted under applicable Laws and accepted pharmaceutical industry norms and ethical practices, or (B) if reasonably practicable and not adverse to patient safety, complete such Clinical Trials and Inovio shall reimburse Advaccine its reasonable, out-of-pocket costs associated therewith. For clarity, except as provided for above, Advaccine may transfer to Inovio or its designee or wind-down any ongoing Clinical Trials prior to the date of termination in accordance with accepted pharmaceutical industry norms and ethical practices and Advaccine will be responsible for any costs associated with such transfer or wind-down. Notwithstanding the foregoing, if this Agreement is terminated by Advaccine pursuant to Sections 13.4 or 13.5, then Inovio will be responsible for any costs associated with such wind-down.

(c) Regulatory Materials; Data. Except if this Agreement is terminated by Advaccine pursuant to Sections 13.4 or 13.5, Advaccine shall (i) provide and assign to Inovio or its designee all Regulatory Materials, including Regulatory Approvals, for the Products to the extent possible under applicable Laws in the Advaccine Territory, (ii) promptly provide to Inovio all Data (to the extent not already provided to Inovio), including pharmacovigilance data, generated by or on behalf of Advaccine, and (iii) promptly return or destroy, at Inovio's election, all Confidential Information of Inovio.

(d) Trademarks. Except if this Agreement is terminated by Advaccine pursuant to Sections 13.4 or 13.5, upon Inovio's written request, Advaccine shall grant to Inovio, effective as of the date of such request, an exclusive, transferable, fully paid-up, royalty free, sublicensable license to use Advaccine Product Marks in connection with the Commercialization of the Products in the Advaccine Territory (and excluding, for clarity, any Advaccine Housemarks).

(e) Transition Assistance. Upon Inovio's reasonable request, (i) Advaccine shall provide such assistance as may be reasonably necessary or useful for Inovio to continue the Development and Commercialization of the Products in the Advaccine Territory, to the extent Advaccine or its Affiliate is then performing or having performed such activities, including upon the reasonable request of Inovio, assigning (to the extent Advaccine has rights to assign) or using Commercially Reasonable Efforts to amend as appropriate any agreements or arrangements Advaccine or its Affiliate have with any Third Party for the Development, distribution, sale or otherwise Commercialization of the Products; and (ii) Advaccine shall provide Inovio with copies of any promotional and marketing materials generated by or on behalf of Advaccine with respect to the Products prior to the effective date of termination. If this Agreement is terminated by Advaccine pursuant to Sections 13.4 or 13.5, Inovio shall bear all costs arising out of any of the transition assistance activities set forth in clause (i) or (ii) performed by Advaccine. If this Agreement is terminated by Advaccine pursuant to Section 13.2 or by Inovio pursuant to Sections 13.3, 13.4, or 13.5, Advaccine shall bear all costs arising out of any of the transition assistance activities set forth in clause (i) or (ii) performed by Advaccine.

(f) Inventory. In the event that this Agreement is terminated in its entirety, Inovio shall have the right, but not the obligation, to purchase any and all of the inventory of the Products held by Advaccine or its Affiliates as of the date of termination, at a price equal to the transfer price paid by Advaccine to Inovio for such inventory. Notwithstanding the foregoing, if this Agreement is terminated by Advaccine pursuant to Sections 13.4 or 13.5, upon Advaccine's request, at its sole discretion, Inovio shall re-purchase any and/or all of its inventory of the Products, at a price equal to the transfer price paid by Advaccine to Inovio (if supplied by Inovio) or Advaccine's manufacturing cost (if manufactured by Advaccine or its subcontractor) therefor. Advaccine shall also have the right to continue to be permitted to sell such inventory for up to at least twelve (12) months after the effective date of termination of this Agreement.

13.7 Survival. Any expiration or termination of this Agreement shall not affect rights or obligations of the Parties under this Agreement that have accrued prior to the date of expiration or termination (including with respect to any payments that have accrued prior to the effective date of expiration or termination of this Agreement). Notwithstanding anything to the contrary, the following

provisions shall survive any expiration or termination of this Agreement: Sections 2.4, 4.5, 8.5 through 8.9 (inclusive), 9.1(a), 9.1(b), 9.1(d), 10.6, 13.6, 13.7 and 13.8 and Articles 1, 11, 12, 14 and 15.

13.8 Termination Not Sole Remedy. Termination is not the sole remedy under this Agreement and, whether or not termination is effected and notwithstanding anything contained in this Agreement to the contrary, all other remedies shall remain available except as agreed to otherwise herein.

Article 14.

Dispute Resolution

14.1 Disputes; Internal Resolution. The Parties recognize that disputes as to certain matters may from time to time arise that relate to either Party's rights and/or obligations hereunder. It is the objective of the Parties to establish procedures to facilitate the resolution of disputes arising under this Agreement in an expedient manner by mutual cooperation. To accomplish this objective, the Parties agree that, except as otherwise provided in Section 3.2(d), if a dispute arises under or relates to this Agreement, including, without limitation, any alleged breach under this Agreement or any issue relating to the interpretation or application of this Agreement, and the Parties are unable to resolve such dispute within thirty (30) days after such dispute is first identified by either Party in writing to the other, the Parties shall refer such dispute to a senior executive of each of Inovio (or one of its Affiliates) and Advaccine (the "**Executive Officers**") for attempted resolution by good faith negotiations within thirty (30) days after notice referring to the dispute is received. If the dispute is not resolved within such thirty (30) days, then the dispute shall be resolved by arbitration in accordance with Section 14.2 and thereafter neither Party shall have any further obligation under this Section 14.1. Notwithstanding the foregoing, and without waiting for the expiration of any such thirty (30)-day periods, each Party shall each have the right to apply to any court of competent jurisdiction for appropriate interim or provisional relief, as necessary to protect the rights or property of such Party.

14.2 Arbitration. All disputes arising out of or in connection with this Agreement, including any questions regarding its formation, existence, validity or termination, or the scope or applicability of this agreement to arbitrate, shall be referred to and finally resolved by arbitration administered by the Singapore International Arbitration Centre ("**SIAC**") under the Arbitration Rules of the Singapore International Arbitration Centre ("**SIAC Rules**") for the time being in force and as may be amended by the rest of this clause.

(a) The seat, or legal place, of arbitration shall be the Republic of Singapore. There shall be three (3) arbitrators, with two (2) arbitrators to be respectively nominated by each Party and the third (presiding) arbitrator to be appointed by SIAC. The language of the arbitration shall be English.

(b) Any decision or arbitral award of SIAC shall be final and binding on each Party. If any Party fails to implement the final arbitral award, the other Party may file an application for the enforcement of the arbitral award to a court with competent jurisdiction. The costs of arbitration shall be borne by the losing Party or as otherwise determined by the arbitral tribunal.

(c) In the course of arbitration, the Parties shall make Commercially Reasonable Efforts to continue to implement the Agreement except for those matters subject to arbitration.

(d) Each Party retains the right to apply to any court of competent jurisdiction for interim and/or conservatory measures, including pre-arbitral attachments or preliminary injunctions, and any such request shall not be deemed incompatible with, or a waiver of, this agreement to arbitrate.

(e) The existence and content of the arbitral proceedings and any rulings or awards shall be kept confidential by the Parties and members of the arbitral tribunal except (i) to the extent that disclosure may be required of a Party to fulfill a legal duty, protect or pursue a legal right, or enforce or challenge an award in bona fide legal proceedings before a state court or other judicial authority, (ii) with the consent of all Parties, (iii) where needed for the preparation or presentation of a claim or defense in this arbitration, (iv) where such information is already in the public domain other than as a result of a breach of this clause, or (v) by order of the arbitral tribunal upon application of a Party.

(f) For avoidance of doubt, nothing contained in this Section 14.2 shall operate as a restriction on a Party's rights to terminate this Agreement pursuant to Article 13.

14.3 Governing Law. This Agreement shall be governed by and construed under, and all disputes arising under or in connection with this Agreement shall be resolved in accordance with, the laws of the State of New York, U.S., without regard to the conflicts of law provisions thereof. The United Nations Convention on International Contracts on the Sale of Goods does not apply to this Agreement and is expressly and entirely excluded.

Article 15.

Miscellaneous

15.1 Entire Agreement; Amendment. This Agreement, including the Exhibits hereto, sets forth the complete, final and exclusive agreement and all the covenants, promises, agreements, warranties, representations, conditions and understandings between the Parties hereto with respect to the subject matter hereof and supersedes, as of the Effective Date, all prior and contemporaneous agreements and understandings between the Parties with respect to the subject matter hereof (other than the Non-Exclusive License Agreement, and that certain Research Service Contract dated December 30, 2020); provided, however, that, Advaccine shall pay to Inovio all amounts invoiced under the Research Service Contract dated December 30, 2020 within thirty (30) days after the Effective Date. The foregoing shall not be interpreted as a waiver of any remedies available to either Party as a result of any breach, prior to the Effective Date, by the other Party of its obligations under the Confidentiality Agreement. There are no covenants, promises, agreements, warranties, representations, conditions or understandings, either oral or written, between the Parties other than as are set forth in this Agreement. No subsequent alteration, amendment, change or addition to this Agreement shall be binding upon the Parties unless reduced to writing and signed by an authorized officer of each Party.

15.2 Force Majeure. Both Parties shall be excused from the performance of their obligations under this Agreement to the extent that such performance is prevented by force majeure and the nonperforming Party promptly provides notice of the prevention to the other Party. Such excuse

shall be continued only for so long as (a) the condition constituting force majeure continues and (b) the nonperforming Party takes all reasonable efforts to remove the condition. For purposes of this Agreement, force majeure shall include conditions beyond the reasonable control of the applicable Party, which may include an act of God, war, civil commotion, terrorist act, labor strike or lock-out, epidemic, pandemic, failure or default of public utilities or common carriers, destruction of production facilities or materials by fire, earthquake, storm or like catastrophe, action or inaction of any Governmental Authority, and failure of plant or machinery. Notwithstanding the foregoing, a Party shall not be excused from making payments owed hereunder because of a force majeure affecting such Party. If a force majeure persists for more than ninety (90) days, then the Parties will discuss in good faith the modification of the Parties' obligations under this Agreement in order to mitigate the delays caused by such force majeure.

15.3 Notices. Any notice required or permitted to be given under this Agreement shall be in writing, shall specifically refer to this Agreement, and shall be addressed to the appropriate Party at the address specified below or such other address as may be specified by such Party in writing in accordance with this Section 15.3, and shall be deemed to have been given for all purposes (a) when received, if hand-delivered or sent by a reputable courier service, (b) five (5) Business Days after mailing, if mailed by first class certified or registered airmail, postage prepaid, return receipt requested, or (c) if sent by electronic mail, upon electronic confirmation of receipt.

If to Inovio: Inovio Pharmaceuticals, Inc.
600 W. Germantown Pike, Suite 110
Plymouth Meeting, PA 19462
Attn: Joseph Kim, President and CEO
Email : joseph.kim@inovio.com

with copies to (which shall not constitute notice):

Inovio Pharmaceuticals, Inc.
600 W. Germantown Pike, Suite 110
Plymouth Meeting, PA 19462
Attn: Tom Mancini, Vice President, Intellectual Property
Email : Thomas.Mancini@inovio.com

and

Cooley LLP
500 Boylston Street
Boston, MA 02116-3737
USA
Attn: Geoffrey Spolyar
Email : gspolyar@cooley.com

If to Advaccine: Advaccine Biopharmaceuticals Suzhou Co., Ltd.
18 Qingqiu Road

Suzhou, China

Attn: Alliance Manager
Email : partner@advaccine.com

with copies to (which shall not constitute notice):

Mengyu LU
Partner
Sidley Austin LLP
39/F, Two International Finance Center
Central, Hong Kong
Email: Mengyu.lu@Sidley.com

15.4 No Strict Construction; Headings. This Agreement has been prepared jointly by the Parties and shall not be strictly construed against either Party. Ambiguities, if any, in this Agreement shall not be construed against any Party, irrespective of which Party may be deemed to have authored the ambiguous provision. The headings of each Article and Section in this Agreement have been inserted for convenience of reference only and are not intended to limit or expand on the meaning of the language contained in the particular Article or Section. Except where the context otherwise requires, the use of any gender shall be applicable to all genders, and the word "or" is used in the inclusive sense (and/or). The term "including" as used herein means including, without limiting the generality of any description preceding such term.

15.5 Assignment; Change of Control.

(a) Except as provided in Section 15.5(b), this Agreement may not be assigned or otherwise transferred, nor may any right or obligation hereunder be assigned or transferred, by either Party without the prior written consent of the other Party. Any attempted assignment not in accordance with the foregoing shall be null and void and of no legal effect. Any permitted assignee shall assume all assigned obligations of its assignor under this Agreement. The terms and conditions of this Agreement shall be binding upon, and shall inure to the benefit of, the Parties and their respected successors and permitted assigns.

(b) Notwithstanding the foregoing, Inovio may, without the consent of Advaccine, (i) assign this Agreement and its rights and obligations hereunder in whole or in part to an Affiliate of Inovio, or in whole to its successor-in-interest in connection with the sale of all or substantially all of its stock or its assets to which this Agreement relates, or in connection with a merger, acquisition or similar transaction; (ii) sell or otherwise assign to any Third Party Inovio's right to receive any payment (or portion thereof) from Advaccine under this Agreement, and/or (iii) grant a security interest in its rights, title and interest in, to and under this Agreement. If Inovio sells or assigns to any Third Party a right to receive a portion or all of its payments under this Agreement, such Third Party shall also have the right to receive the information received by Inovio pursuant to this Agreement and to conduct audits in accordance with Section 8.8 and Advaccine shall, at Inovio's request, cooperate to

facilitate the provision of any such information and the payment of any such amounts directly to such Third Party.

(c) Notwithstanding the foregoing, Advaccine may without consent of Inovio, assign this Agreement or delegate its rights and obligations hereunder in whole or in part to an Affiliate of Advaccine (provided that in such case, Advaccine shall inform Inovio of such assignment or delegation and remain responsible for the performance of its Affiliate under this Agreement), or in whole to its successor-in-interest in connection with the sale of all or substantially all of its stock or its assets to which this Agreement relates, or in connection with a merger, acquisition or similar transaction.

15.6 Performance by Affiliates. Each Party may discharge any obligations and exercise any right hereunder through any of its Affiliates. Each Party hereby guarantees the performance by its Affiliates of such Party's obligations under this Agreement, and shall cause its Affiliates to comply with the provisions of this Agreement in connection with such performance. Any breach by a Party's Affiliate of any of such Party's obligations under this Agreement shall be deemed a breach by such Party, and the other Party may proceed directly against such Party without any obligation to first proceed against such Party's Affiliate.

15.7 Further Actions. Each Party agrees to execute, acknowledge and deliver such further instruments, and to do all such other acts, as may be necessary or appropriate in order to carry out the purposes and intent of this Agreement.

15.8 Severability. If any one or more of the provisions of this Agreement is held to be invalid or unenforceable by an arbitral tribunal constituted in accordance with Section 14.2, the provision shall be considered severed from this Agreement and shall not serve to invalidate any remaining provisions hereof. The Parties shall make a good faith effort to replace any invalid or unenforceable provision with a valid and enforceable one such that the objectives contemplated by the Parties when entering this Agreement may be realized.

15.9 No Waiver. Any delay in enforcing a Party's rights under this Agreement or any waiver as to a particular default or other matter shall not constitute a waiver of such Party's rights to the future enforcement of its rights under this Agreement, except with respect to an express written and signed waiver relating to a particular matter for a particular period of time.

15.10 Independent Contractors. Each Party shall act solely as an independent contractor, and nothing in this Agreement shall be construed to give either Party the power or authority to act for, bind, or commit the other Party in any way. Nothing herein shall be construed to create the relationship of partners, principal and agent, or joint-venture partners between the Parties.

15.11 English Language. This Agreement was prepared in the English language, which language shall govern the interpretation of, and any dispute regarding, the terms of this Agreement.

15.12 Counterparts. This Agreement may be executed in one (1) or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument. This Agreement may be executed via electronic signature or via the exchange

of signed portable document format ("**PDF**") versions of this Agreement. Such electronic signatures, and signatures on PDF versions of this Agreement, will be considered the legally binding equivalent of wet-ink, original, hand-written signatures.

15.13 Rights in Bankruptcy. All rights and licenses granted under or pursuant to this Agreement are, and shall otherwise be deemed to be, for purposes of Section 365(n) of Title 11 of the U.S. Code and other similar laws in any jurisdiction outside the U.S. (collectively, the "**Bankruptcy Laws**"), licenses of rights to "intellectual property" as defined under the Bankruptcy Laws. Upon the occurrence of any Insolvency Event with respect to a Party (the "**Insolvent Party**"), the Insolvent Party agrees that the other Party (the "**Non-Insolvent Party**"), as licensee of such rights under this Agreement, shall retain and may fully exercise all of its rights and elections under the Bankruptcy Laws. Each Party shall, during the Term, create and maintain current copies or, if not amenable to copying, detailed descriptions or other appropriate embodiments, to the extent feasible, of all such intellectual property. Each Party agrees and acknowledges that "embodiments" of intellectual property within the meaning of Section 365(n) include, without limitation, laboratory notebooks, cell lines, product samples and inventory, research studies and data, Regulatory Approvals and Regulatory Materials, in each case to the extent related to the Products. If (i) a case is commenced during the Term by or against a Party under the Bankruptcy Laws, (ii) this Agreement is rejected as provided for under the Bankruptcy Laws, and (iii) the Non-Insolvent Party elects to retain its rights hereunder as provided for under the Bankruptcy Laws, then the Insolvent Party (in any capacity, including debtor-in-possession) and its successors and assigns (including a Title 11 trustee), shall (x) provide to the Non-Insolvent Party immediately upon the Non-Insolvent Party's written request copies of all such intellectual property (including embodiments thereof) held by the Insolvent Party and such successors and assigns, or otherwise available to them, and (y) not interfere with the Non-Insolvent Party's rights under this Agreement, or any related agreements between the Parties, to such intellectual property (including such embodiments), including any right to obtain such intellectual property (or such embodiments) from another entity, to the extent provided in the Bankruptcy Laws. Whenever the Insolvent Party or any of its successors or assigns provides to the Non-Insolvent Party any of the intellectual property licensed hereunder (or any embodiment thereof) pursuant to this Section 15.13, the Non-Insolvent Party shall have the right to perform the Insolvent Party's obligations hereunder with respect to such intellectual property, but neither such provision nor such performance by the Non-Insolvent Party shall release the Insolvent Party from liability resulting from rejection of the license or the failure to perform such obligations. All rights, powers and remedies of the Non-Insolvent Party as provided herein are in addition to and not in substitution for any and all other rights, powers and remedies now or hereafter existing at law or in equity (including the Bankruptcy Laws) in the event of the commencement of a case by or against a Party under the Bankruptcy Laws. In particular, it is the intention and understanding of the Parties that the rights granted to the Parties under this Section 15.13 are essential to the Parties' respective businesses and the Parties acknowledge that damages are not an adequate remedy. The Parties agree that they intend the following rights to extend to the maximum extent permitted by applicable Laws, and to be enforceable under Section 365(n) of Title 11 of the U.S. Code: (A) the right of access to any intellectual property (including embodiments thereof) of the Insolvent Party, or any Third Party with whom the Insolvent Party contracts to perform an obligation of the Insolvent Party under this Agreement, and, in the case of the Third Party, which is necessary for the Development, Manufacture and Commercialization of Products; and (B) the right to contract directly with any Third

Party to complete the contracted work upon failure of the Insolvent Party to comply with its applicable obligations.

{Signature Page Follows}

In Witness Whereof, the Parties have executed this Collaboration and License Agreement in duplicate originals by their duly authorized officers as of the Effective Date.

Inovio Pharmaceuticals, Inc.

By: /s/ J. Joseph Kim

Name: J. Joseph Kim, PhD

Title: President & CEO

Advaccine Biopharmaceuticals Suzhou Co., Ltd.

By: /s/ Jane Yu

Name: Jane Yu

Title: President

List of Exhibits

Exhibit A: Inovio Licensed Patents
Exhibit B: Inovio Licensed Know-How

Exhibit A

CERTAIN CONFIDENTIAL INFORMATION CONTAINED IN THIS DOCUMENT, MARKED BY [***], HAS BEEN OMITTED BECAUSE IT IS NOT MATERIAL AND WOULD LIKELY CAUSE COMPETITIVE HARM TO THE COMPANY IF PUBLICLY DISCLOSED

Inovio Licensed Patents

[***]

CERTAIN CONFIDENTIAL INFORMATION CONTAINED IN THIS DOCUMENT, MARKED BY [***], HAS BEEN OMITTED BECAUSE IT IS NOT MATERIAL AND WOULD LIKELY CAUSE COMPETITIVE HARM TO THE COMPANY IF PUBLICLY DISCLOSED

Exhibit B
Inovio Licensed Know-How

To be mutually agreed upon within thirty (30) days after the Effective Date. Exhibit B shall only include a requirement to provide Licensed Know-How not previously provided to Advaccine.

CERTAIN CONFIDENTIAL INFORMATION CONTAINED IN THIS DOCUMENT, MARKED BY [***], HAS BEEN OMITTED BECAUSE IT IS NOT MATERIAL AND WOULD LIKELY CAUSE COMPETITIVE HARM TO THE COMPANY IF PUBLICLY DISCLOSED

Exhibit 21.1

INOVIO PHARMACEUTICALS, INC.
Subsidiaries

Subsidiary Name(1)	Jurisdiction of Organization
Inovio Asia, LLC	South Korea

Exhibit 23.1

Consent of Independent Registered Public Accounting Firm

We consent to the incorporation by reference in the following Registration Statements:

1. Registration Statement (Form S-3 No. 333- 236202) of Inovio Pharmaceuticals, Inc.,
2. Registration Statement (Form S-3 No. 333- 237172) of Inovio Pharmaceuticals, Inc.,
3. Registration Statement (Form S-3 No. 333- 252256) of Inovio Pharmaceuticals, Inc.,
4. Registration Statement (Form S-8 No.333-161559) pertaining to Inovio Biomedical Corporation 2007 Omnibus Incentive Plan,
5. Registration Statement (Form S-8 Nos. 333-166906, 333-174353, 333-181532, 333-192318, 333-196325, 333-209155, and 333-216061) pertaining to Inovio Pharmaceuticals, Inc's 2007 Omnibus Incentive Plan,
6. Registration Statement (Form S-8 Nos. 333-216059, 333-223776, 333-230337, and 333-231872) Inovio Pharmaceutical, Inc.'s 2016 Omnibus Incentive Plan, and
7. Registration Statement (Form S-8 No. 333-236201) Inovio Pharmaceutical, Inc.'s 2016 Omnibus Incentive Plan, as amended

of our reports dated March 1, 2021, with respect to the consolidated financial statements and the effectiveness of internal control over financial reporting of Inovio Pharmaceuticals, Inc. included in this Annual Report (Form 10-K) of Inovio Pharmaceuticals, Inc. for the year ended December 31, 2020.

/s/ Ernst & Young LLP

San Diego, California

March 1, 2021

Exhibit 31.1

Certification of CEO Pursuant to
Securities Exchange Act Rules 13a-15(e) and 15d-15(e)
as Adopted Pursuant to
Section 302 of the Sarbanes-Oxley Act of 2002

I, J. Joseph Kim, certify that:

1. I have reviewed this annual report on Form 10-K of Inovio Pharmaceuticals, Inc.

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15(d)-15(f)) for the registrant and have:

   (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

   (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

   (c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

   (d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

   (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

   (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: March 1, 2021

/s/ J. Joseph Kim

J. Joseph Kim
President, Chief Executive Officer and Director

Exhibit 31.2

Certification of CFO Pursuant to
Securities Exchange Act Rules 13a-15(e) and 15d-15(e)
as Adopted Pursuant to
Section 302 of the Sarbanes-Oxley Act of 2002

I, Peter Kies, certify that:

1. I have reviewed this annual report on Form 10-K of Inovio Pharmaceuticals, Inc.;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15(d)-15(f)) for the registrant and have:

   (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

   (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

   (c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

   (d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

   (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

   (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control

Date: March 1, 2021

/s/ PETER KIES

Peter Kies
Chief Financial Officer

Exhibit 32.1

Certification Pursuant to
18 U.S.C. Section 1350,
As Adopted Pursuant to
Section 906 of the Sarbanes-Oxley Act of 2002

In connection with the Annual Report of Inovio Pharmaceuticals, Inc. (the "Company") on Form 10-K for the year ending December 31, 2020 as filed with the Securities and Exchange Commission on the date hereof (the "Report"), each of the undersigned, in the capacities and on the date indicated below, hereby certifies, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that to his knowledge:

(1) The Report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934; and

(2) The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Date: March 1, 2021

/s/ J. Joseph Kim

J. Joseph Kim
President, Chief Executive Officer and Director
(Principal Executive Officer)

Date: March 1, 2021

/s/ Peter Kies

Peter Kies
Chief Financial Officer
(Principal Financial and Accounting Officer)