Our commentary and responses to your questions may contain forward-looking statements, including comments concerning clinical trials and product development programs, evaluation of potential opportunities, the level of corporate expenditures, the assessment of Inovio’s technology by potential corporate partners, capital market conditions, timing of events, cash consumption, and other information concerning factors that could cause actual results to differ materially from those set forth in our Annual Report on Form 10-K for the year ended December 31, 2017, our Quarterly Report on Form 10-Q for the quarter ended June 30, 2018, and other regulatory filings from time to time.
Inovio’s technology platform works *in vivo* to activate an individual’s immune system, generating robust T cell and antibody responses to fight cancer and infectious disease.

**SynCon®**: Synthetic consensus full-length DNA plasmid

- **Select** appropriate tumor or viral associated antigens as disease targets
- **Create** a synthetic consensus DNA sequence for the disease target using sequences from multiple species for cancer or primary isolates of the pathogen
- **Modify** the sequence to increase antigen production
- **Insert** the proprietary sequence into a platform-validated DNA plasmid

**CELLECTRA®**: EP delivery device that enhances immune responses

- SynCon immunotherapy delivered into muscle or skin cells
- Uses the most advanced transfection technology to dramatically increase immunotherapy cellular uptake and generate up to a 1000-fold increase in antigen expression
Inovio’s T cell Immunotherapy Strategy

**Human papilloma virus (HPV) Immunotherapeutic**

- HPV is a **viral** infection that causes **cancer**
- Inovio’s MOA and platform developed to target diverse tumor types and pathogens

**Infectious Diseases**

- Applying the same MOA, generating T cells and antibodies against other **viral** diseases

**Immuno-Oncology**

- From pre-cancer into HPV caused H&N and cervical **cancers**
- Expansion beyond virally associated antigens; tumor-antigens
- Novel checkpoint combinations
<table>
<thead>
<tr>
<th>Product</th>
<th>Indication</th>
<th>Preclinical</th>
<th>Phase 1</th>
<th>Phase 2</th>
<th>Phase 3</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>VGX-3100</td>
<td>Cervical Dysplasia</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Ongoing Phase 3; data readout 2020</td>
</tr>
<tr>
<td></td>
<td>Vulvar/Anal Dysplasia</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Initiated P2 2Q17/Initiated P2 2Q18; interim efficacy data 2019</td>
</tr>
<tr>
<td>INO-5401</td>
<td>Bladder Cancer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Dosed first subject August 2018; interim readouts 2019</td>
</tr>
<tr>
<td></td>
<td>Glioblastoma</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Dosed first subject June 2018; interim readouts 2019</td>
</tr>
<tr>
<td>INO-5150</td>
<td>Prostate Cancer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Completed Phase 1; Candidate for Out-licensing</td>
</tr>
<tr>
<td>INO-1400</td>
<td>hTERT antigen</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Reported data 2017; Key Ag component of INO-5401</td>
</tr>
<tr>
<td>INO-1800</td>
<td>Hepatitis B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Completed Phase 1; Candidate for Out-licensing</td>
</tr>
<tr>
<td>MEDI0457</td>
<td>Head &amp; Neck Cancer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>MedImmune</td>
</tr>
</tbody>
</table>

**INTERNALLY FUNDED**

**PARTNER FUNDED**
HPV-Associated Diseases
Cancers linked to the HPV rose dramatically in a 15-year period within the U.S., despite an increase in vaccination rates.

570,000 cases and 311,000 deaths associated with HPV-associated cervical cancer in 2018 worldwide.

CDC reported 43,371 new cases of HPV-associated cancers within the U.S. in 2015.

44% spike since 1999.

Cervical cancer is the most commonly diagnosed cancer in 28 countries and the leading cause of cancer death in 42 countries.

Unmet Treatment Needs of HPV-Related Precancers

- VGX-3100 is indicated for the treatment of the following precancerous diseases caused by HPV types 16 and 18:
  - High-grade Cervical Dysplasia
  - High-grade Vulvar Dysplasia
  - High-grade Anal Dysplasia
- First-in-class HPV-specific immunotherapy
- Targets the major underlying cause of anogenital cancer
- Treats precancer without invasive surgery

### Annual Incidence (HPV 16/18+ Precancers)

<table>
<thead>
<tr>
<th>Tissue</th>
<th>US</th>
<th>EU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cervical</td>
<td>195,000</td>
<td>233,000</td>
</tr>
<tr>
<td>Vulvar</td>
<td>23,000</td>
<td>15,000</td>
</tr>
<tr>
<td>Anal</td>
<td>13,400</td>
<td>2,514</td>
</tr>
</tbody>
</table>
HPV Caused Precancers: Limitations of Surgery

Loss of Reproductive Health

Pain

Surgical Complications

Negative Psychosocial Impact

Cervical

Recurrence of CIN2/3,4 after LEEP

10% - 16%

23.5%

HPV-16 DNA detected in patients after LEEP

Vulvar

Recurrence post-surgery with clean margins

>50%

Anal

Recurrence post-surgery

40-50%

Phase 2b Achieves All Primary and Secondary Endpoints

**Ph3 Primary Endpoint:** Cervical HSIL regression to low or normal AND HPV clearance

<table>
<thead>
<tr>
<th></th>
<th>VGX-3100</th>
<th>Control</th>
<th>Difference</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>40.2%</td>
<td>14.3%</td>
<td>25.9%</td>
<td>p=0.001</td>
</tr>
</tbody>
</table>

- Efficacy correlates to immune responses
- PP and mITT p-values equal
- 167 subjects
- Paper published in *The Lancet* September 2015
- \(^1\)Strata-adjusted

**T Cell Responses Measured in Blood**

*Statistically significant; bars are 95% CI

**T Cell Responses Measured in Tissue**

“Cold”

“Hot”
VGX-3100 has the potential to be:
1) the first treatment for HPV infection of the cervix and;
2) the first non-surgical treatment for precancerous cervical lesions

- VGX-3100: Targets HPV 16/18 subtypes; E6/E7 oncogenes
- Treats high-grade squamous intraepithelial lesions (HSIL)
- Consists of two studies in parallel:
  - REVEAL I (primary) n=198
  - REVEAL II (confirmatory) n=198
- Randomized (2:1), double-blind, placebo-controlled
- Dosing: month 0, 1, 3 (as in P2b)
- Primary endpoint: month 9 (as in P2b)
- REVEAL 1: Study follow-up through week 88 (as in P2b)
- REVEAL 2: Study follow-up through week 40
- Opened 70 sites across 16 countries as of June
- Report data from both studies in 2020

Primary Endpoint
Regression of HSIL (CIN2/3)
AND clearance of HPV 16/18 in the cervix

Secondary Endpoints
Safety/tolerability
Regression of HSIL
Virologic clearance of HPV-16 and/or HPV-18
Non-progression to cancer
Clearance of HPV from non-cervical anatomic locations
Immuno-Oncology Programs
Rationale for Checkpoint Combinations with Inovio Products

**Checkpoint Inhibitor Therapies Combined with Inovio Cancer Products**

- Potential to improve response rates, without adding toxicity

- Tumor infiltration of antigen-specific, functional CD8+ T cells may prime patients for treatment with checkpoint inhibitors and increase response rates

- Combination studies initiated in 2017
  - MEDI0457 with MedImmune
  - INO-5401 with Regeneron and Genentech

Preclinical mouse model

Paper published in *Molecular Therapy* 2017
Immuno-Oncology Studies with Efficacy Endpoints

MEDI0457
(licensed out to MedImmune)
- Metastatic HPV-related squamous cell carcinoma of the head & neck (SCCHN) with persistent or recurrent disease after chemotherapy treatment
- Combination with durvalumab (IMFINZI™) PD-L1 checkpoint inhibitor
- Phase 1/2 open label study: safety, immunological impact, objective response rate, progression-free survival and overall survival
- ~50 subjects. Enrolling.

INO-5401
(combination of 3 tumor-associated antigens: hTERT, PSMA, WT1)
- Advanced unresectable or metastatic urothelial carcinoma (bladder cancer)
- Combination with atezolizumab (TECENTRIQ®) PD-L1 checkpoint inhibitor
- Phase 1b/2 open-label trial: safety, immune response and clinical efficacy
- ~80 subjects; ~60 will be PD-1/PD-L1 refractory patients
- 1st patient dosed Aug. 2018

INO-5401
(combination of 3 tumor-associated antigens: hTERT, PSMA, WT1)
- Newly diagnosed glioblastoma multiforme (GBM)
- Combination with REGN2810 PD-1 checkpoint inhibitor
- Phase 1b/2a open label trial: safety, tolerability, immunological impact, progression-free survival and overall survival.
- ~50 subjects
- 1st patient dosed June 2018
MEDI0457: Turning “Cold” Tumors to “Hot” Tumors in Phase 1

Before treatment with MEDI0457

After treatment with MEDI0457

CD8+ T Cells in H&N Tumor

Phase 1 study of MEDI0457 in 22 HPV+ H&N Cancer Patients

• Increase in CD8+ killer T cell observed in 20 of 22 patients

• One patient developed progressive disease at 11 months into the study and exited the study

• Subsequently received four doses of PD-1 inhibitor nivolumab and sustained complete response

• Continues on therapy with no evidence of disease 24 months (and counting) after initiation of a PD-1 inhibitor

• Immune analyses suggest that MEDI0457 had activated HPV16-specific CD8+ T cells in the patient and the subsequent treatment with a checkpoint inhibitor helped to unleash the expansion of these killer T cells

• MEDI conducting phase 2 studies combining MEDI0457 and durvalumab (PD-L1 inhibitor)

Presented at SITC 2017
Published in Clinical Cancer Research (CCR) 2018
Platform Development Programs
## Positive Clinical Data & Partnering Opportunities

<table>
<thead>
<tr>
<th>Product</th>
<th>Indication</th>
<th>Data Reported (to date)</th>
<th>Partner/s</th>
<th>Next Milestone</th>
</tr>
</thead>
</table>
| **PENNVAX-GP** | HIV        | • Phase 1: **93% (71 of 76)** evaluable vaccinated participants showed a CD4+ or CD8+ cellular immune response to at least one of the vaccine antigens  
• **94% (62 of 66)** demonstrated an env specific antibody response | [NIH](https://www.nih.gov) / [NIAID/HVTN](https://www.ho) | Expect results from P1/2 HIV trial study 2H19 (UCSF; Deeks) |
| **INO-4201** | Ebola      | • Phase 1: High levels of binding antibodies measured (ELISA) in **95% (170 of 179)** of evaluated subjects | [DARPA](https://www.darpa.mil)                | Additional data to report 4Q18                    |
| **GLS-5300** (INO-4301) | MERS   | • Phase 1: High levels of binding antibodies measured (ELISA) in **92% (57 of 62)** of evaluated subjects  
• **98% (61 of 62)** generated an antibody and/or T cell response against MERS | [GeneOne](https://www.geneone.com) / [CEPI](https://www.cepii.org) | Additional Data 4Q18; begin CEPI funded P2 trial in 2019 |
| **GLS-5700** | Zika       | • Phase 1: High levels of binding antibodies measured (ELISA) in **100% (39 of 39)** of evaluated subjects  
Highlights & Upcoming Milestones
## 2017-2018 Company Highlights

### Collaborations & Partnerships

<table>
<thead>
<tr>
<th>MedImmune</th>
<th><strong>REGENERON</strong></th>
<th><strong>Roche</strong></th>
<th><strong>Genentech</strong></th>
<th><strong>PARKER INSTITUTE</strong></th>
<th><strong>ApolloBio</strong></th>
<th><strong>CEPI</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Initiation of the Phase 2 portion of the SSCHN trial; $7.0 million milestone</td>
<td>Entered into collaboration agreement; INO-5401 + cemiplimab for treating GBM</td>
<td>Entered into collaboration agreement; INO-5401 + TECENTRIQ for treating Bladder Cancer</td>
<td>Entered into collaboration agreement; Evaluation of novel combo regimens within I-O</td>
<td>Closed license agreement; VGX-3100 (CIN) in Greater China; upfront $23M</td>
<td>Signed R&amp;D agreement for MERS and Lassa; $56M funding over 5 yrs.</td>
<td></td>
</tr>
</tbody>
</table>

### Clinical & Regulatory Milestones

- Commenced Phase 3 trial (REVEAL 1) of VGX-3100 for treating high-grade cervical dysplasia (HPV 16/18)
- Completed a Phase 1 trial with INO-5150 for treating prostate cancer and reported interim data
- Dosed first patients in two cancer studies; GBM and Bladder Cancer
- Dosed first patient in Phase 1/2 trial to determine PENNVAX®-GP’s Ability to Induce Remission of HIV Infection
- Completed enrollment of 160 patient Zika-002 Phase 1/2 trial in Puerto Rico
2018-2019 Upcoming Milestones

2018 Upcoming Milestones & Catalysts

• 4Q18: Additional data report/publications of HIV, Ebola, and Prostate Cancer Phase 1 Studies
• 4Q18: Report on Zika vaccine Puerto Rico study
• 4Q18/early 1Q19: Dose last patient in REVEAL 1, Phase 3 study of VGX-3100; begin enrollment for REVEAL 2
• 4Q18: Collaborative partner MedImmune/AstraZeneca to expand HPV study with MD Anderson (trigger milestone to Inovio)

2019 Upcoming Milestones & Catalysts

• 2019: Phase 1/2 interim data from Bladder INO-5401 study
• 2019: Phase 1/2 interim data from GBM INO-5401 study
• 2019: Phase 2 interim data on MEDI0457 study
• 2019: Phase 1/2 interim data on MERS vaccine Korea study; initiate Phase 2 trial in Middle East
Financials and Management
# Financial Information

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recent share price</td>
<td>$5.56</td>
</tr>
<tr>
<td>Shares outstanding</td>
<td>91.5 M</td>
</tr>
<tr>
<td>Market cap</td>
<td>$508.74 M</td>
</tr>
<tr>
<td>Cash &amp; short-term investments</td>
<td>$95.6 M</td>
</tr>
<tr>
<td>Debt</td>
<td>0 M</td>
</tr>
</tbody>
</table>

1 September 28, 2018

2 June 30, 2018
Senior Management

J. Joseph Kim, Ph.D.
President & CEO
- Decades of biotechnology/pharma management
- Merck: hepatitis A and B vaccines manufacturing; HIV vaccine (Ad5) R&D

Peter Kies
CFO
- Ernst & Young
- Experience with growth companies

Niranjan Y. Sardesai, Ph.D.
COO
- Extensive biotech management and product development experience
- Led diagnostics development for mesothelioma, bladder cancer, and ovarian cancer for Fujirebio Diagnostics

Mark L. Bagarazzi, M.D.
CMO
- Clinical research experience incl. Merck
- Led clinical/regulatory for shingles and rotavirus vaccines; DNA vaccine expert

Laurent Humeau, Ph.D.
SVP, R&D
- Extensive R&D leadership experience in vaccine, cell and gene therapy developments in private biotech and mid-cap companies
- Led Translational Research, Human Therapeutics Division for Intrexon
Board of Directors

Avtar Dhillon, MD Chairman, BOD
• Seasoned venture capitalist and biotech entrepreneur

Simon X. Benito
• Former Senior Vice President, Merck Vaccine Division

Angel Cabrera, PhD
• President, George Mason University

Morton Collins, PhD
• General Partner, DSV Ventures, Battelle Ventures and Innovations Val. Partners

J. Joseph Kim, PhD
• President & CEO, Inovio

David B. Weiner, PhD
• Executive VP, The Wistar Institute; Director, Vaccine Center

Wendy Yarno
• Former Chief Marketing Officer, Merck & Co.
Scientific Advisory Board

David B. Weiner, PhD
Chairman
• “Father of DNA vaccines”
• Executive VP, The Wistar Institute; Director, Vaccine Center

Anthony W. Ford-Hutchinson, PhD
• Former SVP, Vaccines R&D, Merck
• Oversaw development: Singulair®, Januvia®, Gardasil®, Zostavax®, Proquad® and Rotateq®

Stanley A. Plotkin, MD
• Developed rubella and rabies vaccines
• Oversaw Sanofi flu vaccine
• Emeritus Professor, Wistar Institute & University of Pennsylvania
Investment Thesis

Bringing **IMMUNO-INGENUITY** to life

- Powerful T-cell activating immunotherapy platform, with multiple cancer and infectious disease targets
- Checkpoint inhibitor combination programs leading with big pharma
- Transforming treatment of HPV-associated Diseases
- Validation: Partnerships, Publishing, Grants, and Global Expansion

INO: NASDAQ
Appendix
Inovio’s Key Differentiators

**Potent, in vivo generation of antigen-specific CD8+ killer T cells**

- Highly optimized DNA sequences and efficacy-enabling delivery device
- Favorable safety profile – **6,000+ administrations across 1,600+ patients**
- Zero anti-vector response – allows for effective boosting

**Combining T Cell-Generating Technology with Checkpoint Inhibitors**

- Checkpoint inhibitors are only effective in ~20% of treated patients in most cancer indications
- Combining CD8+ killer T cells could potentially unlock the full capabilities of checkpoint inhibitors

**Speed and versatility of platform**

- From concept to human testing in 7 months, **fastest in vaccine history (e.g. Inovio Zika vaccine)**
- Thermal stability and distribution (room temp storage >1 yr.)
- Rapid and scalable manufacturing
A Proven Technology Platform

**SynCon® antigen genetic code enables precise targeting of cancer or pathogen**
- Designed to break tolerance and cover mutating strains
- Versatility to target a broad range of diseases, with multiple antigens that direct a specific and potent immune response to disease targets

**Highly optimized SynCon® plasmid + novel CELLECTRA® delivery**
- Generates optimal antigen production *in vivo*
- Activates robust functional CD8+ killer T cell and antibody responses
- Significant antigen-specific immune responses in more than 1,000 patients and counting
- Phase 2b proof of concept data published in *The Lancet*

**Favorable safety profile**
- Administered in over 1,500 subjects and 5,000 immunizations
- Immunotherapy consists of highly purified DNA, water, and salt
Inovio Immunotherapy Technology Platform – Steps to Activating Potent Antigen Specific Immune Responses

Inovio immunotherapies induce a patient’s immune system to produce functional antibodies and killer T cells to fight cancer and infectious disease.

1. Identify diverse strains/variants of a target virus or cancer
2. Assess gene sequence of selected antigen(s) from chosen strains/variants of the virus or cancer
3. Create optimal Consensus Sequence for the selected antigen
4. Insert Synthetic Consensus Sequence for each selected antigen into a separate DNA plasmid
5. Manufacture SynCon® Immunotherapy
6. Deliver immunotherapy into muscle or skin using efficacy-enhancing CELLECTRA® Device
7. Protective antibodies and killer T cells produced by immune system against diverse strains of a virus or cancer

Sequence 1: MEKIVLFAIV...SL
Sequence 2: AMEKIVLFAIV...SL
Sequence X Consensus: AMEKIVLFAIV...SK
AMEKIVLFAIV...SL
Inovio’s therapeutic immunotherapy induces a patient’s immune system to produce functional antibodies and killer T cells

- **SynCon® plus CELLECTRA® Delivery Technology**
  - **SymCon**: Synthesizes the DNA vaccine
  - **CELLECTRA**: Delivers the DNA vaccine to the cells
  - **DNA vaccine**: Injected into the muscle or skin tissue
  - **Electrical pulses**: Create temporary openings in the cell membrane
  - **Nucleus**: DNA enters the cell
  - **Lymph node**: ANTIGEN PRESENTING CELL engulfs the antigen and carries it to lymph nodes
  - **Killer T cells**: Identify and destroy virus-infected cells
  - **Antigen**: Prevents future infections and clears already-infected cells

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Enhanced Cellular Delivery: Key Enabler of SynCon® Immunotherapies

- DNA plasmids must get through protective membrane into a cell to work
- Best method to enhance cellular uptake is electroporation
- SynCon® DNA plasmid and CELLECTRA® delivery device are currently being used in our Phase 3 program
CELLECTRA® 5PSP Delivery Device
Innovation in the Delivery of SynCon® Immunotherapy

**CELLECTRA®-5PSP**
- Intra muscular
- 13, 19, 25mm electrodes
- In clinical use

**CELLECTRA®-3P**
- Intradermal – Minimally invasive
- 3 mm electrodes
- In clinical use

**Surface EP (SEP)**
- Surface
- Noninvasive
- 4x4 electrode array
- Specifically targets epidermis
- In late stage preclinical development
Inovio’s Technology Platform Addresses Shortcomings of Conventional Vaccine Platforms

- Robust Immune Responses (T cell and B cell)
- SynCon® Rapid Design
- Multi-antigen Immunotherapy in Single Vial
- Refrigerated (2-8°C) Storage >3 years
- Rapid & Scalable Manufacture
- No Anti-Vector Response (effective boosting)
- Room Temp (25°C) Storage >1 year; 37°C > 2 months

SynCon®, CELLECTRA®, Plasmids, Host DNA
Design + Delivery = Improved Immune Responses

Display of GFP gene expression after electroporation delivery into rabbit muscle

Immunized 3x with 15ug pNP responses @2 wk post Imm
Clinical Confirmation of Inovio’s MOA Benefit
HIV Antigen Response

- CD4 and CD8 intracellular cytokine staining (IFN-γ, IL-2) response associated with IL-12 and EP administration (2 clinical studies) with HIV gag, pol, env antigens/plasmids
- Dosing at 0, 4, 12 weeks
- Performed by independent HVTN Core Lab at University of Washington in NIH-sponsored trials

Responses to three doses of vaccine delivered with EP are greater than responses to four doses of vaccine delivered IM

\* HVTN 080 (N = 48 total). Responses shown against global peptides post-third dose, based on evaluable responders.

\* HVTN 070 (N = 120 total). Responses shown against global peptides post-third dose, based on evaluable responders.
Inovio and ApolloBio Transaction: VGX-3100

- On December 28, 2017, Inovio entered into an amended and restated Collaboration and License Agreement with ApolloBio Corporation
  - ApolloBio to receive exclusive rights to VGX-3100 within Greater China (China, Hong Kong, Macao, Taiwan)
  - Potential inclusion of The Republic of Korea within three years of the Effective Date
  - Inovio to receive upfront cash payment of $23M
  - Inovio to further receive up to $20M based upon achievement of VGX-3100 regulatory milestones (US, China, Korea), and double digit royalties on all net sales of VGX-3100 within the licensed territory
- Agreement subject to closing conditions including the final approval of ApolloBio’s Board of Directors and shareholders, as well as regulatory and currency approvals required by The People’s Republic of China
- Closed in 1Q 2018; reflected in 1Q18 reported cash
First Partnership to Initiate Immuno-Oncology Strategy

**AstraZeneca/MedImmune**  
*(deal signed August 2015)*

<table>
<thead>
<tr>
<th>Products</th>
<th>MEDI0457 (previously INO-3112) HPV-driven cancer immunotherapy + 2 new R&amp;D products</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upfront Payment</td>
<td>$27.5 million</td>
</tr>
<tr>
<td>Development Costs</td>
<td>All development costs</td>
</tr>
<tr>
<td>Milestone Payments</td>
<td>$700 million</td>
</tr>
<tr>
<td>Royalties</td>
<td>Up to double digit tiered royalties on MEDI0457 + royalties for additional cancer vaccine products</td>
</tr>
</tbody>
</table>

- MedImmune intends to study MEDI0457 in combination with selected immuno-oncology molecules within its pipeline
- On Dec. 28, 2017, Inovio received a milestone payment upon advancement of H&N cancer combination trial into Phase 2
Lytic phenotype: patient PBMCs stimulated 120 hours \textit{in vitro} with antigen. No co-stimulation; no cytokine added at any time.

- Activation markers: CD38, CD69, CD137
- Lytic proteins: perforin, granzyme A, granzyme B, granulysin
Induction of CD8+ Activation, Lytic Protein Synthesis, and Humoral Immune Responses to HPV 16 and 18 in MEDI0457 Treated HNSCC Patient

8 of 9 patients show CD8+ responses to MEDI0457

Representative patient
Rationale for Checkpoint Combinations with Inovio Products

Figure 1: Delivery of αCTLA-4 or αPD-1 post-1st vaccination synergizes with mTERT above checkpoint alone in generating anti-tumor immune response.
MEDI0457: Turning “Cold” Tumors to “Hot” Tumors in Phase 1

Before treatment with MEDI0457

After treatment with MEDI0457

Control: FoxP3

CD8

“Cold”

“Hot”
Rapid response technology platform desired by health authorities to fight emerging infectious diseases

- Inovio DNA vaccine platform demonstrates rapid design, manufacturing, and clinical development of products for emerging diseases

- Commercialization drivers
  - Grants, such as CEPI $56M MERS & Lassa grant, DARPA $45M Ebola award, Gates $8.8M, IVI grant for MERS
  - Priority review voucher potential
  - Stockpiling contracts: scale manufacturing

- Coalition for Epidemic Preparedness Innovations (CEPI)
  - “The coalition will also develop so-called platform technologies—experimental approaches to producing new vaccines that use synthetic DNA to kick-start an immune response.” – MIT Technology Review
    - Newly formed CEPI is largest-ever initiative to finance/develop new vaccines to address emerging infectious diseases
    - Initial $540M investment: Germany, Japan, Norway, Bill & Melinda Gates Foundation and Wellcome Trust
Safety and Immunogenicity of an Anti–Zika Virus DNA Vaccine — Preliminary Report

Pablo Tebas, M.D., Christine C. Roberts, Ph.D., Kar Muthumani, Ph.D., Emma L. Reuschel, Ph.D., Sagar B. Kudchodkar, Ph.D., Faraz I. Zaidi, M.S., Scott White, M.D., Armir S. Khan, Ph.D., Trina Racine, Ph.D., Hyeree Choi, B.S., Jean Boyer, Ph.D., Young K. Park, J.D., Sylvie Trottier, M.D., Celine Remigio, D.P.T., R.N., Diane Krieger, M.D., Susan E. Spruill, M.S., Mark Bagarazzi, M.D., Gary P. Kobinger, Ph.D., David B. Weiner, Ph.D., and Joel N. Maslow, M.D., Ph.D.

- Concept to 1st patient dosed in ~6 months.
- Only vaccine with clinical data – 100% antibody response rates
- Current Puerto Rico study is ongoing
Inovio’s DNA-based monoclonal antibody products target:

<table>
<thead>
<tr>
<th>Cancers</th>
<th>Infectious Diseases</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Checkpoint Inhibitors (CI)</td>
<td>• Influenza A &amp; B (published)</td>
</tr>
<tr>
<td>• PD-1</td>
<td>• Pseudomonas (published)</td>
</tr>
<tr>
<td>• PD-L1</td>
<td>• MRSA/Staph</td>
</tr>
<tr>
<td>• 4 additional CIs</td>
<td>• Ebola</td>
</tr>
<tr>
<td>• Trastuzumab</td>
<td>• MERS</td>
</tr>
<tr>
<td>• Anti-PSMA (published)</td>
<td>• Dengue (published)</td>
</tr>
<tr>
<td>• Anti-Tregs</td>
<td>• CHIKV (published)</td>
</tr>
<tr>
<td>• Other anti-cancer pathways</td>
<td>• HIV (published)</td>
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<td>• Other infectious diseases</td>
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DARPA awards $57M to advance dMAb application and develop products for Ebola, influenza and antibiotic resistant bacteria
Inovio: Fully Integrated Capabilities for Immunotherapy R&D and Manufacturing

- Corporate, Clinical, Regulatory, Compliance, Biostatistics, and Data Management functions
- ~120 FTE

**Philadelphia Corporate and Operations Site**

- Molecular biology, cell biology, and clinical immune monitoring
- Research grade DNA manufacture capabilities
- 6,000 sf dedicated BSL-2 research lab (wet lab and cell culture)
- 5,000 sf cGLP labs to process, store, and analyze human clinical trial samples
- Well established QA capability
- ~65 FTE

**San Diego Research Center**

- Electroporation delivery device and consumable design, engineering, and manufacturing
- Delivery device testing and distribution
- 53,000 sf facility opened in July 2017
- ISO 13485 and MDD certified by TÜV America in San Diego
- ~100 FTE

**San Diego Device Engineering and Manufacturing Facility**

- ~100 FTE