THE FUTURE OF VACCINES

DECEMBER 2016
This presentation includes forward-looking statements that involve risks, uncertainties and other factors, many of which are outside of our control that could cause actual results to differ materially from the results discussed in the forward-looking statements. Forward-looking statements include statements regarding our short-term objectives and opportunities, financial expectations for the full year and financial preparedness as of year end, as well as statements concerning our plans, objectives, goals, future events, performance and/or other information that is not historical information. All such forward-looking statements are expressly qualified by these cautionary statements and any other cautionary statements which may accompany the forward-looking statements. We undertake no obligation to publicly update or revise forward-looking statements to reflect subsequent events or circumstances after the date made, except as required by law.
MULTIPLE LAYERS OF VALUE

1 approved product
8 active programs

Validated Platform Technology
(NIH, BARDA, BMS, Janssen)

2 focus areas
Infectious Disease & Oncology

Expertise in T-Cell Stimulation & Antibody Response

3 Phase 3 Products
Multiple near-term milestones

Broad Pipeline & Late-Stage Candidates

$1.2B in US government contracts
$900M in revenues over past 10 years
$975M BMS deal - PROSTVAC
$358M Janssen deals - Ebola and HPV

Strong Revenue Base to Re-Invest in Clinical Pipeline
LIVE VIRUS VACCINE PLATFORM
VALIDATED AND MODULAR APPROACH EMPLOYING POXVIRUSES

Antigenic Complexity
Low
Wide Variety of Target Diseases

High

Recombinant Poxviruses

Simple

Complex

Customized Immunogenicity

Target Multiple Antigens for a Single Disease

Vectors
Antigens
Promoters
Co-Stimulatory Molecules (TRICOM)

Widely Applicable Technology for Infectious Disease and Cancer Immunotherapy
COMMERCIAL MANUFACTURING CAPABILITIES

Commercial Production Facility

- Inspected by the EMA and the FDA
- 28M doses of IMVAMUNE delivered to US national stockpile
- Over 2M doses of MVA-BN Filo (Ebola) delivered to Janssen

Poxvirus Manufacturing Expertise

- Commercial partnerships in place with Janssen & BMS
- All manufacturing performed by BN
- Company has developed IP and extensive know-how in the production of poxvirus based vaccines

Multi-Product Facility

- Highly scalable, fully integrated, reduces dependency on sub-contractors
- Fill/Finish established to support commercial launch of PROSTVAC
- Production of all clinical trial material
FINANCIAL PERFORMANCE

- Revenues of more than DKK 1bn for the fourth consecutive year
- Break-even result for third consecutive year
- Cash preparedness doubled since 2013
# PIPELINE

<table>
<thead>
<tr>
<th>PRODUCT</th>
<th>INDICATION</th>
<th>ONGOING STUDIES</th>
<th>PRECLINICAL</th>
<th>PHASE 1</th>
<th>PHASE 2</th>
<th>PHASE 3</th>
<th>MARKET</th>
<th>COMMERCIAL RIGHTS</th>
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<tbody>
<tr>
<td><strong>INFECTIOUS DISEASES</strong></td>
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<tr>
<td>IMVAMUNE (liquid-frozen ¹)</td>
<td>Smallpox</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Bavarian Nordic</td>
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<tr>
<td>IMVAMUNE freeze-dried</td>
<td>Smallpox</td>
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<td>Bavarian Nordic</td>
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<tr>
<td>MVA-BN Filo</td>
<td>Ebola/Marburg</td>
<td>10</td>
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<td></td>
<td>Janssen</td>
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<tr>
<td>MVA-BN RSV</td>
<td>RSV</td>
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<td></td>
<td>Bavarian Nordic</td>
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<tr>
<td>MVA-BN HPV</td>
<td>Chronic HPV Infection</td>
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<td>Janssen</td>
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<tr>
<td><strong>CANCER IMMUNOTHERAPY</strong></td>
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<td>PROSTVAC</td>
<td>Prostate Cancer</td>
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<td>Bristol-Myers Squibb</td>
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<td>CV301</td>
<td>Lung Cancer (NSCLC)</td>
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<td>Bavarian Nordic</td>
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<tr>
<td>MVA-BN Brachyury</td>
<td>Metastatic Tumors</td>
<td>1</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>Bavarian Nordic</td>
</tr>
</tbody>
</table>

¹) Approved in the European Union under the trade name IMVANEX® and in Canada under the trade name IMVAMUNE®. Phase 3 registration studies are ongoing in the United States.
PROSTVAC
PRIME/BOOST PSA TARGETED “OFF THE SHELF” CANCER VACCINE

Heterologous prime/boost regimen

Vaccinia or MVA + Fowlpox

Subcutaneous administration

Heterologous prime/boost regimen

Vaccinia or MVA + Fowlpox

Subcutaneous administration

PSA
CEA, MUC-1
HER-2
Brachyury

Tumor antigens with epitopes enhanced for HLA binding

Prostate, lung, head & neck, bladder, colorectal, breast, ovarian and renal cancers

TRICOM
(TRIad of COstimulatory Molecules)

Enhance T-Cell activation in synergistic manner

Strengthen the anticancer immune response

Safe and well tolerated (11 clinical trials)

Injection site reactions and flu-like symptoms
PROSTVAC INDUCES AN ANTIGEN CASCADE AGAINST PROSTATE CANCER CELLS

Summary of T-cell responses from six PROSTVAC clinical trials

<table>
<thead>
<tr>
<th>Test</th>
<th>Result</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSA-Specific Immune response</td>
<td>56.7% (59/104)</td>
<td>28 days after last vaccine</td>
</tr>
<tr>
<td>Median fold increase in PSA-specific immune response</td>
<td>5X</td>
<td>PSA response 30 / 10^6 cells flu response 33 / 10^6 cells</td>
</tr>
<tr>
<td>Antigen Cascade</td>
<td>67.9% (19/28)</td>
<td></td>
</tr>
<tr>
<td>Anti-PSA Ab</td>
<td>0.57% (2/349)</td>
<td></td>
</tr>
</tbody>
</table>

PROSTVAC CANCER IMMUNOTHERAPY
PHASE 3 STUDY STATUS

PROSPECT
A Randomized, Double-blind, Global Phase 3 Efficacy Trial of PROSTVAC in Metastatic Castration-Resistant Prostate Cancer

Randomization by region (N=1,297)
- 25.7% Rest of World (n=333)
- 38.2% Western Europe (n=497)
- 18.4% North America Oncology (n=239)
- 17.7% North America Urology (n=229)
- USA, Canada
- Australia, Estonia, Israel, Poland, Russia

Final data anticipated in 2017
- Interim Analysis #1 ✓ 214 events 40%
- Interim Analysis #2 ✓ 321 events 60%
- Interim Analysis #3 ✓ 427 events 80%
- Final Analysis 534 events 100%

Injections
- Average was 6.1 injections\(^1\)
- Randomized Phase 2 trial (n=122) had average of 5.4 injections\(^2\)
- An increased number of injections is expected to improve the clinical outcome for patients receiving the active drug.

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\(^1\) Subjects who have completed study treatment phase or have completed 7\(^{th}\) dosing visit. N=1,279
\(^2\) Kantoff et al., Journal of Clinical Oncology, January 2010
## COMMERCIAL LICENSE WITH BRISTOL-MYERS

<table>
<thead>
<tr>
<th>Milestone</th>
<th>Value</th>
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<tr>
<td>Upfront payment</td>
<td>$60M</td>
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<tr>
<td>License</td>
<td>$80M</td>
</tr>
<tr>
<td>Phase 3 data</td>
<td>$50M</td>
</tr>
<tr>
<td>Data-driven milestones</td>
<td>$180M*</td>
</tr>
<tr>
<td>Regulatory milestones</td>
<td>$110M</td>
</tr>
<tr>
<td>Sales milestones</td>
<td>$495M</td>
</tr>
<tr>
<td>Tiered royalties on future sales</td>
<td>High teens up to mid-twenties</td>
</tr>
</tbody>
</table>

* Based on Phase 2 data
PROSTVAC STUDIES
SPAN PROSTATE CANCER DISEASE LANDSCAPE

Hormone dependent
No pain
Nonmetastatic

Castration resistant
Pain
Metastatic

Hormonal, immunotherapy
chemotherapy, radiation therapy

Tumor volume

chemotherapy
radiation therapy

mono (NCI)
hormonal combo (NCI)
mono (NCI)
hormonal combo (NCI)
chemotherapy combo (NCI)

mono (NCI)
hormonal combo (NCI)
mono (NCI)
chemotherapy combo (NCI)

ipi combo (NCI)
mono (NCI)
hormonal combo (NCI)

radiation combo (NCI)

death

mono (NCI)
thrombosis

mono (MUSC)

ipi combo (UCSF)

ipi + nivo combo (NCI)
surgery

Phase 3 (BN)

COMPLETED (8)
ONGOING (10)
PLANNED (1)
• ADT increases thymus size, cell number and regeneration
• ADT increases T cell trafficking to the prostate gland
• ADT treated tumor cells become more sensitive to T cell killing

Aragon-Ching et al.: Frontiers in Bioscience 2007
Mercader M et al.: Proc Natl Acad Sci USA 2001
Demonstrated potential as a combination therapy with BMS’ ipilimumab

Prostvac + ipilimumab Phase 1 Trial

Additional Phase 2 Combination Studies:

Neoadjuvant Prostate cancer

Phase 2 (n=75)

- Prostvac
- Ipilimumab
- Prostvac + ipi

Sponsor: UCSF Clinicaltrials.gov NCT02506114

Phase 2 (n=65)

- Prostvac + ipi + nivo
- Prostvac + ipi
- Prostvac + nivo

Sponsor: NCI

Patients in 10mg/kg dose cohort (N=15) reported 37.2 months median overall survival. ~20% of 10mg/kg patients remain alive at 80 months.

Large unmet medical need: children & elderly

- Global RSV disease burden is estimated at 64 million cases and 160,000 deaths every year
- The U.S. Centers for Disease Control and Prevention (CDC) reports that each year the disease causes 177,000 hospitalizations and 14,000 deaths among adults older than 65
- No approved prophylactic vaccine available

Development strategy

- 2H2016: Phase 2
  - Elderly + Adults at risk
  - Children >5yrs

- 2017: Phase 2 field efficacy
  - Phase 1/2
MORE TRANSGENES INCREASE THE PROTECTIVE EFFICACY OF RSV VACCINES

Improved efficacy by multi-antigen vaccine in the sensitive RT-qPCR

![Graph showing the efficacy of different vaccines](image)

- **Non-vaccinated**
- **RSV**
- **MVA-BN G**
- **MVA-BN F**
- **MVA-BN FG**
- **MVA-BN-RSV**

**RSV in the lungs (L gene copies)**

- **10^7**
- **10^6**
- **10^5**
- **10^4**
- **10^3**
- **10^2**
- **10^1**

**MVA-BN-RSV encodes F, G (a), G (b), N and M2**
MVA-BN AN IDEAL RSV VACCINE PLATFORM

**MVA-BN RSV**

- Based upon the MVA-BN vaccine vector - favorable safety profile, approved in EU & Canada and commercial manufacturing in-place
- Designed to generate a balanced antibody and T cells responses to both RSV subtypes (A&B)
  - Encodes two main surface proteins F & G
  - Encodes the G surface protein from both RSV subtype A&B - poor cross reactivity between RSV subtypes
  - Encodes two highly conserved internal RSV proteins (N & M2) - good inducers of T cell responses

Construct was designed for a balanced immune response to minimize the risk of enhanced disease & encourage cross strain reactivity (protection against both RSV subtypes)
RSV PHASE 1 POSITIVE TOP LINE RESULTS

**Safety**
- No unexpected and/or serious adverse reactions
- Vast majority of events represent local and systemic reactions typical for vaccines - reported as mild to moderate and resolved rapidly without intervention (≤5 days)
- Low incidence of local and systemic reactions typical for vaccines and comparable between age groups

**Immunogenicity**
- Dose response and differences between age groups was observed in the immune responses
- Antibodies against RSV significantly boosted in the majority of subjects
  - 2-fold increase in both IgG and IgA in elderly
  - Boosted neutralizing antibodies against both RSV subtypes (A&B)
- T cell responses were boosted in all elderly subjects
  - 3-5 fold increase in T cell responses (F, G, N proteins & whole RSV)
  - Robust T cell response

Randomized, placebo controlled study, 63 healthy subjects
PHASE 2 ELDERLY STUDY INITIATED

Randomized, blinded, placebo controlled dose ranging study in 400 volunteers

- Objective: Identify optimal dose and schedule
- Topline data available mid-2017

<table>
<thead>
<tr>
<th>Groups</th>
<th>N</th>
<th>Vaccine Dose (Inf.U)</th>
<th>Schedule (Day)</th>
<th>0</th>
<th>28</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>80</td>
<td>1x10^8</td>
<td>Vaccine</td>
<td>Vaccine</td>
<td>Placebo</td>
</tr>
<tr>
<td>2</td>
<td>80</td>
<td>1x10^8</td>
<td>Vaccine</td>
<td>Vaccine</td>
<td>Vaccine</td>
</tr>
<tr>
<td>3</td>
<td>80</td>
<td>5x10^8</td>
<td>Vaccine</td>
<td>Vaccine</td>
<td>Placebo</td>
</tr>
<tr>
<td>4</td>
<td>80</td>
<td>5x10^8</td>
<td>Vaccine</td>
<td>Vaccine</td>
<td>Vaccine</td>
</tr>
<tr>
<td>5</td>
<td>80</td>
<td>-</td>
<td>Placebo</td>
<td>Placebo</td>
<td>Placebo</td>
</tr>
<tr>
<td>Total</td>
<td>400</td>
<td></td>
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</tbody>
</table>
CV-301 CANCER IMMUNOTHERAPY
DESIGNED FOR THE TREATMENT OF MULTIPLE CANCERS

New and improved vaccine construct based on MVA-BN

MVA-BN + CEA + MUC-1 = CV-301

Lung, Breast, Colorectal, Ovarian, Gastric, Bladder, Liver and Renal cancer

Leverage Existing Clinical Data

Preliminary evidence of efficacy generated in multiple clinical studies.

Safety data with over 300 subjects treated.

CV-301 in Combination with Immune Checkpoint Inhibitors

BN sponsored

NCSLC

Bladder

Colorectal

Exploring combinations with PD-1/PD-L1 in company collaborations or with NCI
CV-301 IN COLORECTAL CANCER: MONOTHERAPY

- NCI-sponsored Phase 2 study at Duke University
- 74 patients with surgical resection and chemotherapy for metastatic colon cancer followed by CV-301 (with GM-CSF or dendritic cells)
- 161 concurrent, matched Duke control patients

![Survival Probability Graph]

- Longer overall survival (p < 0.0001)
- PFS not different

Morse MA et al., Ann Surg 2013
UPREGULATION OF PD-L1 AFTER CV301 TREATMENT
MC38-MUC1 MOUSE CRC MODEL

Tissue harvest: day 25
1E7 Inf.U CV-301-V on day 4
5E7 Inf.U CV-301-F on day 11 and 18
CV301 & NIVO PROOF-OF-CONCEPT STUDY IN NSCLC

Phase 1
Safety CV301 single agent (n=18)

Phase 1b
Single dose combination with nivolumab (n=22)

Phase 2
Multi-center trial
Up to 20 sites in USA

Randomization
CV301 + nivo (n=60)
  nivo (mono) (n=60)

Treatment schedule: 24 months

Endpoints
• Safety, tolerability
• Primary endpoint: OS
• Secondary endpoints: ORR, DOR, PFS, Immune effects

• BMS will supply nivolumab at no cost to BN
• Bavarian Nordic retains all commercial rights to CV301

Clinicaltrials.gov
NCT02840994
OUR COLLABORATION WITH JANSSEN

MVA-BN Filo (Ebola)
License & Supply Agreement
US$ 187m

2014

MVA-BN HPV
License Agreement
US$ 171m

2015

MVA-BN
Undisclosed target
Potential license agreement

MVA-BN
Undisclosed target
Potential license agreement

A sustained partnership

- Janssen took almost 5% equity stake in BN upon signing Ebola deal
- Validation of our MVA-BN technology & manufacturing
- Recent publication of Ebola Phase 1 data confirms durable immune responses when combining MVA-BN and AdVac.
FIRST IN HUMAN DATA FOR THE BAVARIAN NORDIC/JANSSEN EBOLA PRIME-BOOST VACCINE

- 72 healthy volunteers randomized into four groups receiving prime-boost vaccine regimen or placebo at intervals of 28 or 56 days

- An open-label arm with 15 healthy volunteers is also investigating a shorter prime-boost interval of 14 days for Ad26.ZEBOV prime and MVA-BN Filo boost

AdVac + MVA-BN Provides Durable Response

Phase 2 & 3 Clinical Trials Ongoing in the US, EU and Africa
# MVA-BN BRACHYURY
## PHASE 1 NOVEL IMMUNOTHERAPY CANDIDATE WITH BROAD POTENTIAL

<table>
<thead>
<tr>
<th>Indications</th>
<th>Development Strategy</th>
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<tbody>
<tr>
<td>• Chordoma (ultra-orphan disease)</td>
<td>• NCI Phase 1 and Phase 2 trials</td>
</tr>
<tr>
<td>• Triple negative breast cancer</td>
<td>• NCI Phase 2 chemotherapy combination trial(s)</td>
</tr>
<tr>
<td>• Merkel Cell Carcinoma</td>
<td>• NCI erlotinib combination trial(s)</td>
</tr>
<tr>
<td>• NSCLC</td>
<td>• NCI and BN immune checkpoint inhibitor combinations</td>
</tr>
<tr>
<td>• Multiple solid tumors</td>
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</tbody>
</table>

- Brachyury expression is highly correlated with metastatic disease, and multi-drug resistance
- Brachyury is not expressed in most normal tissue
- Brachyury is responsible for epithelial to mesenchymal transition (EMT), which is a major driver of metastasis
These findings show for the first time that advanced cancer patients can be safely immunized with an MVA-based vaccine targeting brachyury, and can develop brachyury-specific T-cell immune responses.¹

¹Heery, Donahue, et al.
### IMVAMUNE / IMVANEX PRODUCT SUMMARY

<table>
<thead>
<tr>
<th>Status</th>
<th>Revenue Generation</th>
<th>Freeze Dried</th>
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<tbody>
<tr>
<td>• Only non-replicating smallpox vaccine approved in the EU</td>
<td>• Awarded ~$1.2B in contracts from the US government, of which more than $950M has been received</td>
<td>✓ Demonstrated bioequivalence</td>
</tr>
<tr>
<td>• Commercialized in liquid frozen formulation</td>
<td>• Recognized $126M and $154M in revenue in 2013 and 2014, respectively</td>
<td>✓ Potential 10+ year shelf life</td>
</tr>
<tr>
<td>• Stockpiled by the US government (EUA)</td>
<td></td>
<td>✓ Potentially no storage limitations</td>
</tr>
<tr>
<td>• Phase 3 trial ongoing to support FDA approval</td>
<td></td>
<td>✓ Supports US government’s long-term stockpiling goals</td>
</tr>
<tr>
<td>• 7,600 patients dosed</td>
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</tbody>
</table>

Freeze Dried Formulation Represents a Potential Multi-Billion Dollar Market Opportunity

(a) Emergency Use Authorization.
IMVAMUNE PARTNERSHIP WITH THE U.S.

More than $1.2bn in R&D and supply contracts to-date

IMVAMUNE® liquid-frozen

R&D & Supply Contracts
20 million doses
$679m
2003 - 2012

IMVAMUNE® freeze-dried

R&D Contract
$95m
2009-2011

Bulk Supply
$233m
2015-2016

Supply Contract
8 million doses
$228m
2013

Long-term stockpiling goal

132 million doses

Stockpile Resupply
20 million doses

2013 - 2020

More than $1.2bn in R&D and supply contracts to-date

2003 - 2012

2013

$679m

$228m

$95m

$233m

$228m

$679m

2003 - 2012

2013

2009-2011

2015-2016

2013 - 2020
ANTICIPATED SELECTED MILESTONES
2016/2017

**PROSTVAC**
- Prostate cancer
  - Phase 3 top-line data including interim analyses
  - Data from NCI-sponsored Phase 2 trials
  - Initiate Phase 2 study in combination with ipilimumab in collaboration with BMS
  - Initiate NCI-sponsored Phase 2 study in combination with ipilimumab and nivolumab

**IMVAMUNE**
- Smallpox vaccine
  - Finalize manufacturing activities to support a U.S. EUA for freeze-dried IMVAMUNE
  - Additional Rest of World orders
  - Top-line data of Phase 3 non-inferiority study

**Janssen**
- Partnership
  - Complete Phase 2 and Phase 3 studies of the Ebola prime-boost vaccine regimen
  - Initiate HPV Phase 1 study in cervical cancer
  - Potential expanded collaboration with Janssen on two additional infectious disease targets

**Pipeline**
- Projects
  - MVA-BN RSV Phase 2 field efficacy initiation
  - MVA-BN Brachyury Phase 2 initiation
  - CV301 + nivo Phase 2 initiation in lung cancer
  - CV301 + checkpoint inhibitor Phase 2 initiation in two additional indications
  - MVA-BN RSV Phase 2 dosing study read out