



GLOBAL PARTNERSHIPS AND INTERNATIONAL PREPAREDNESS: CHALLENGES AND INNOVATIVE PARTNERING

Joe Larsen, Ph.D.
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Preparedness is a global affair...

GLOBAL

A failure to address the problem of antibiotic resistance could result in:



10m
deaths
by 2050

Costing
£66
trillion



BARDA's International Partnerships

- Increasing awareness that global partnerships are needed to effectively respond to emerging infectious diseases and adequately prepare for existing threats
- No one organization can do it alone
- Responses are global so our partnerships should be as well



BARDA 2017-2021

- Partnerships of global reach and unprecedented efficiency will be required
- BARDA will:
 - Expand its number of portfolio partnerships
 - Conceive of new programmatic and business models for CBRN, Flu, and EID
 - Increase direct collaboration with NGOs
 - When appropriate, establish bilateral relationships with countries to facilitate response to EIDs and other threats



Examples of Existing Partnerships



Burn MCMs



International Collaboration ASPR/BARDA with Taiwan

Background:

- On June 27, 2015 a color festival celebration turned in to a burn mass casualty.
- At a concert held at a water park, where many gathered in drained pools.
- Color powder dust ignited and caused a massive explosion.
- About 470 people had varying degrees of burns. To date, 15 victims died while many remained hospitalized with severe burns.



International Collaboration ASPR/BARDA with Taiwan

Response:

- Many countries offered technical assistance including AATB (American Association of Tissue Bank) by donating cadaver skin
- At International Soc. Burn Injuries (ISBI-2016) meeting, response integration by Taiwan was recognized to be very commendable- with only 3% fatality

**Mutual recognition of need for collaboration
in burn care preparedness**



International Collaboration ASPR/BARDA with Taiwan

Collaboration Goals:

Lessons to Learn for Burn Care Preparedness

- BARDA and TECRO (Taipei Economic and Cultural Representative Office in the United States) are in process of establishing a Letter of Intent (via AIT)
- BARDA with burn experts from ABA and Taiwan will study various aspects of the burn casualty response in an urban environment.
 1. Impact assessment of new burn MCMs under development
 2. Identify critical factors in burn response to address in a national context



Pandemic Influenza



BARDA Influenza International Program Objectives

- Protect people by reducing the global risk of influenza
- Develop and sustain influenza vaccine manufacturing capabilities and capacity for pandemic readiness: promote international investment, diplomacy and partnerships
- Achieve sustainable influenza vaccine production capacity worldwide by leveraging BARDA's unique resources



HHS/BARDA International Initiatives – Benefits to the US and the World

- BARDA is uniquely positioned to lead an effort to build sustainable influenza vaccine production capacity worldwide with:
 - Full spectrum of pharmaceutical technical expertise
 - Established relationships with multinational pharmaceutical companies, international government and non-government organizations
 - Proven approach to domestic vaccine manufacturing capacity building.
- Benefits to the US and the World
 - Reduced burden on the US to produce and distribute limited vaccine
 - More efficient to produce vaccine locally/regionally
 - Promotes international biological diplomacy
 - Enhanced global capability to respond to an influenza pandemic
 - More equitable and geographical distribution of vaccine
 - Reduces the threat of pandemic influenza

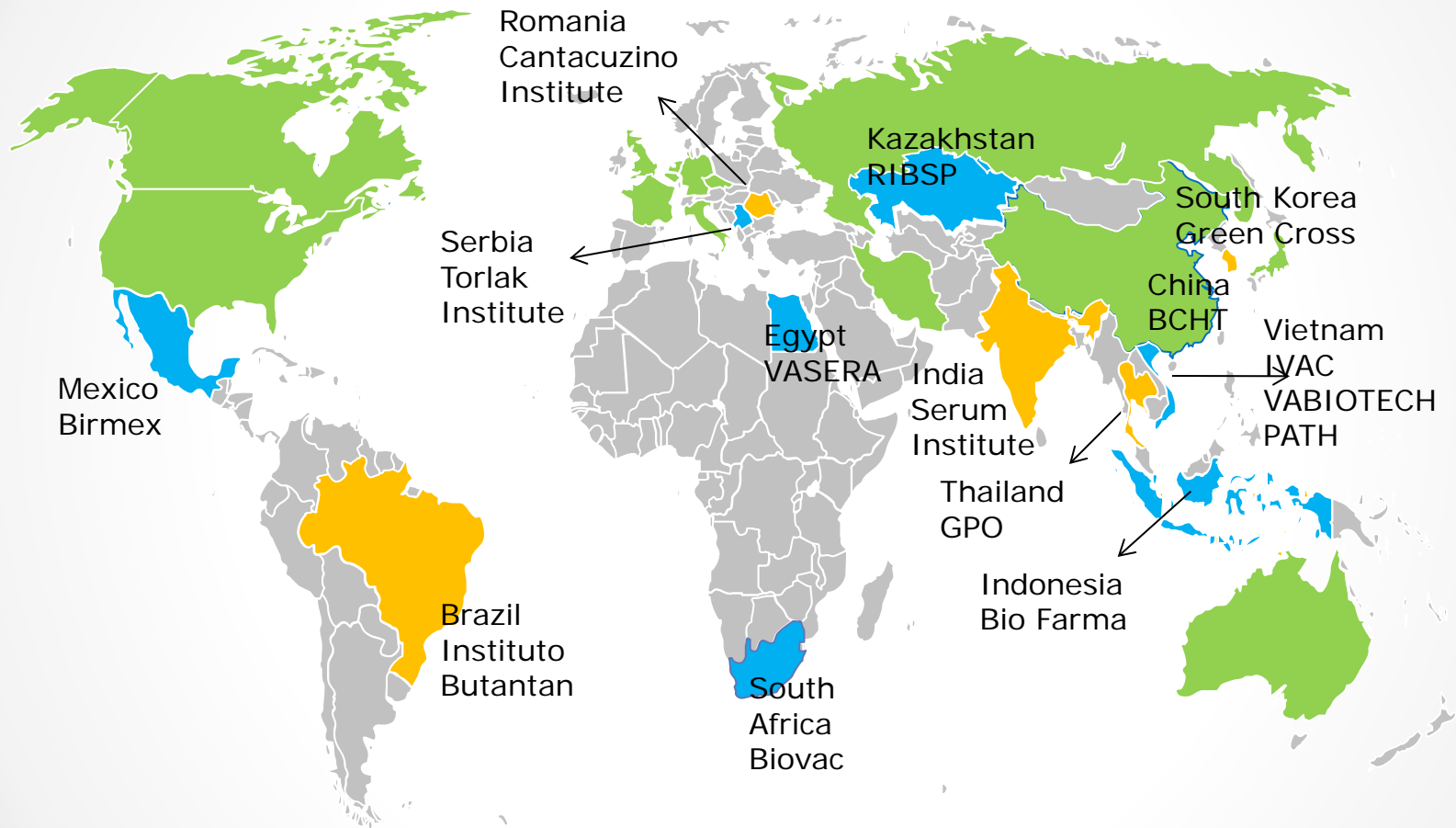


Current Cooperative Agreements

1. World Health Organization (Geneva, Switzerland): Development of Sustainable Influenza Vaccine Production Capacity in Under Resourced Nations in Support of the Global Action Plan for Influenza Vaccines (GAP)
 - Aug 1, 2013 to July 31, 2017; \$25.5M
2. PATH (Seattle, WA, USA): Chemistry, Manufacturing, and Control (CMC) and Clinical Trial Technical Support for Influenza Vaccine Manufacturers in Under-Resourced Nations
 - Sep 30, 2013 to Sep 29, 2017; \$14M
3. Infectious Disease Research Institute (IDRI) (Seattle, WA, USA): Establish Adjuvant Hub to Enable Adjuvanted Influenza Vaccines in Under-Resourced Nations
 - Sep 30, 2014 to Sep 29, 2017; \$8M

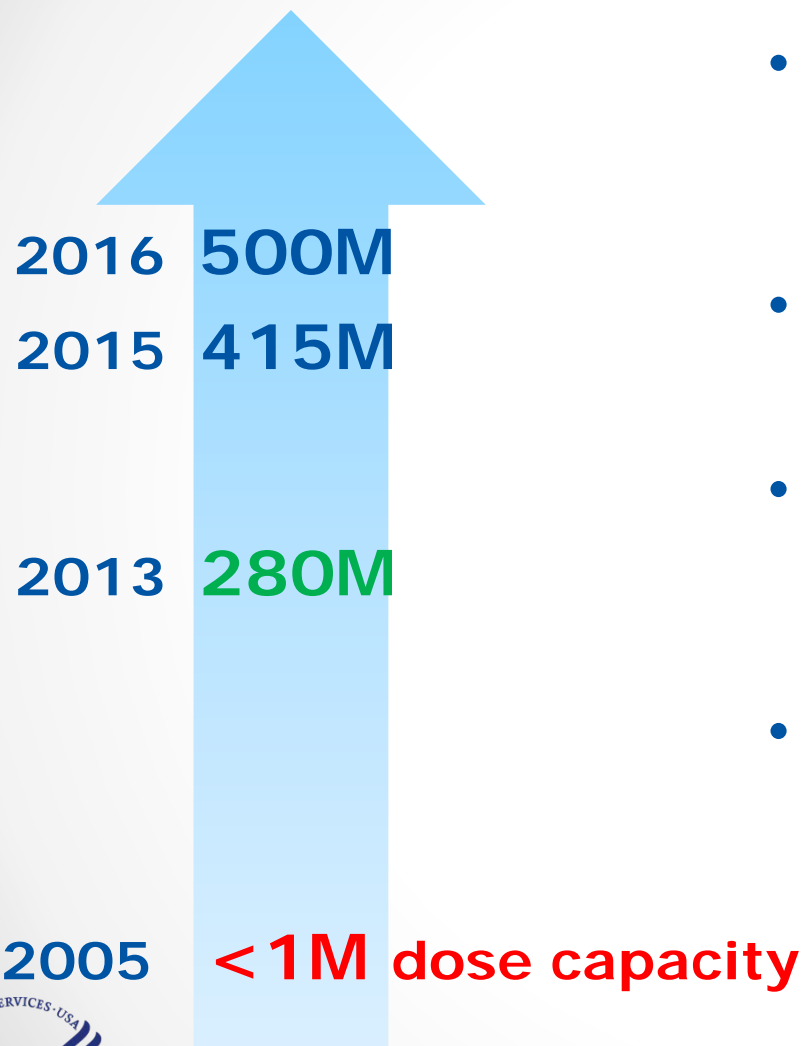


Geographical Distribution of Influenza Vaccine Production as of 2016



- Licensed/Active Influenza Vaccine Producers
- BARDA/WHO Cooperative Agreement/Grantees
- BARDA/WHO Licensed Pandemic Vaccine for Human Use

BARDA International Program Goals by 2016



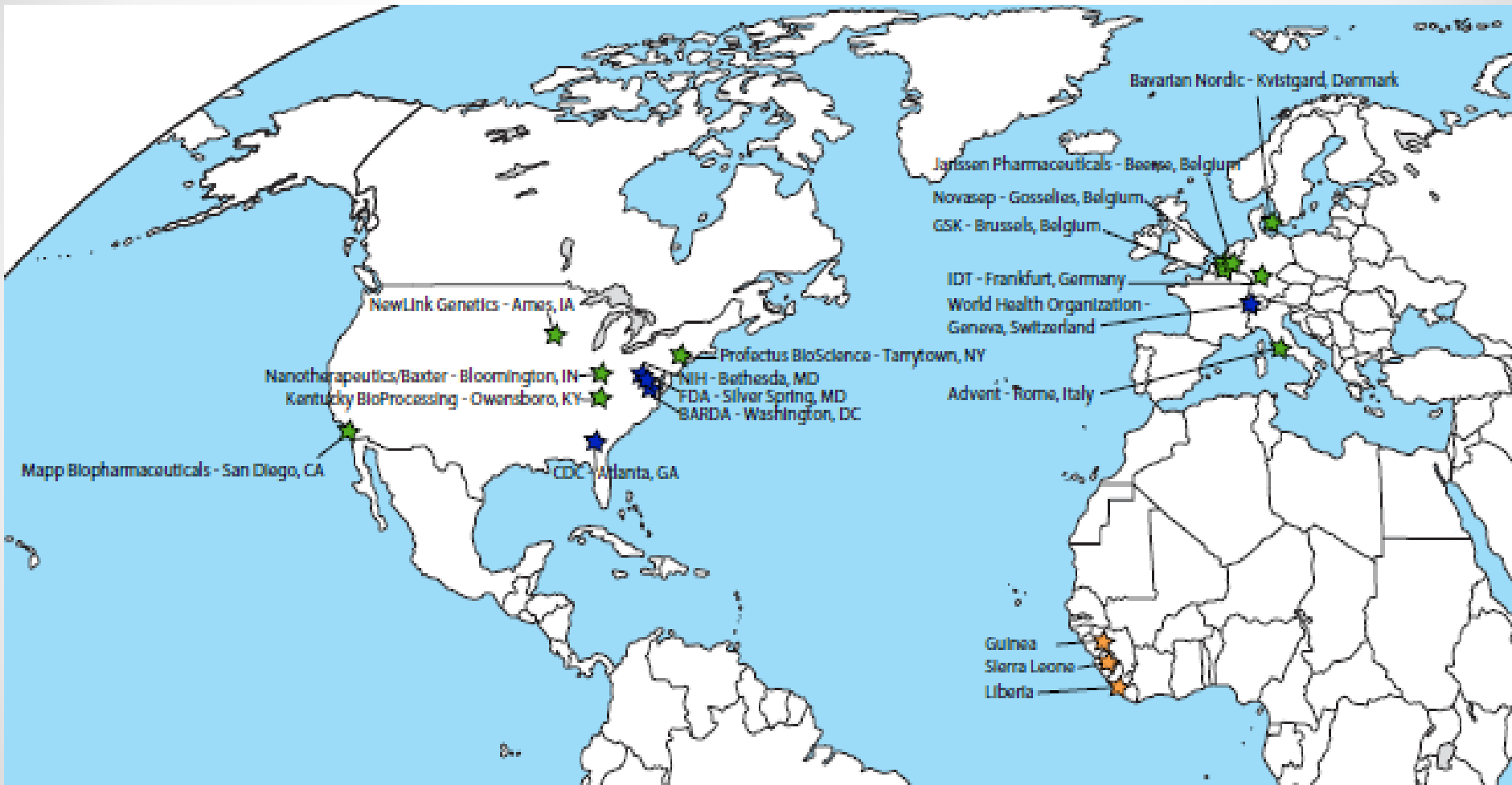
- Advance clinical development of influenza vaccine by at least nine developing country vaccine manufacturers
- Licensure of influenza vaccine by at least seven developing country vaccine manufacturers
- Enhance technical skills and best practices through training in advanced manufacturing and in-country technical support
- Production capability for at least 500M doses of pandemic vaccine by the end of 2016

Global Partnerships = Make More Vaccine, Faster and Better

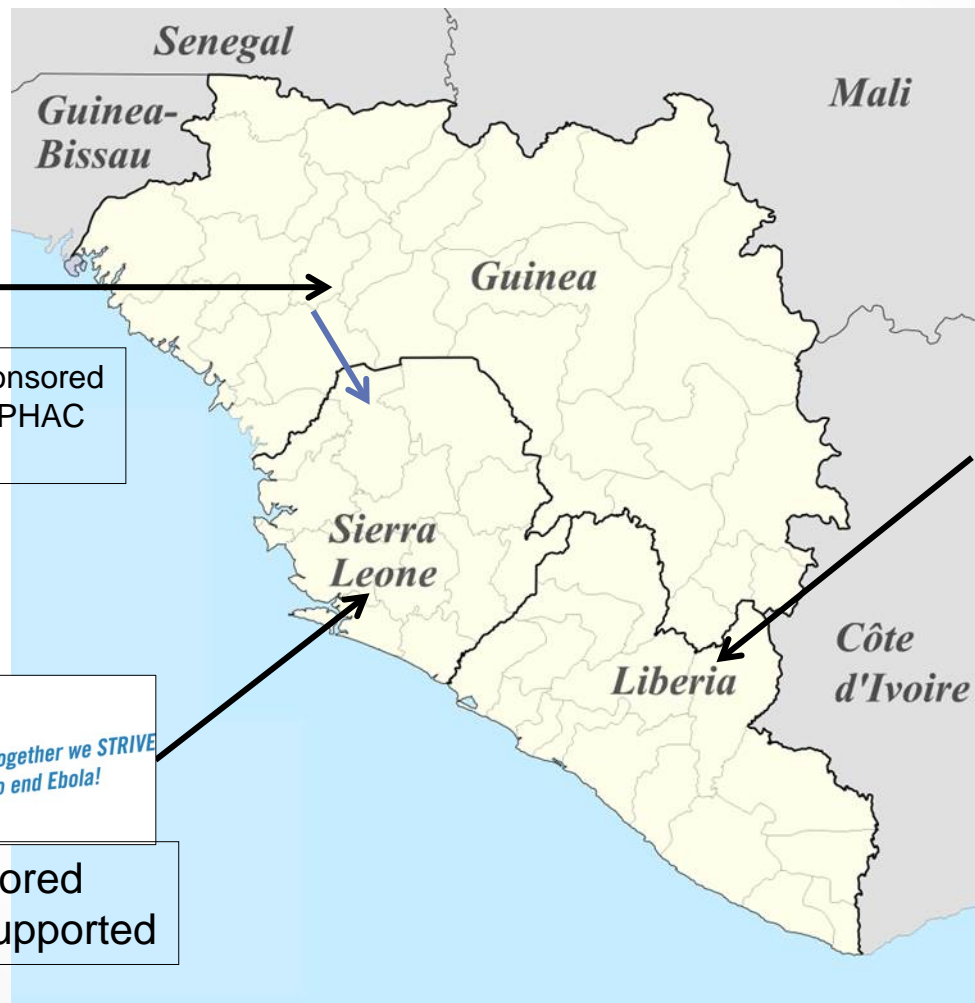
Ebola



BARDA's Ebola Response Has Been Global



Three, Large, Phase II/III Vaccine Trials in West Africa



Campagne Ebola Ça Suffit

MSF, WHO, and Guinea Govt. Sponsored
WHO, WT, MSF, RC of Norway, PHAC
Supported



CDC Sponsored
CDC/BARDA Supported



NIH Sponsored
and Supported



ZMapp in West Africa

- Despite the end of the outbreak, work remains to develop candidate products
- BARDA supported Mapp Biopharmaceutical and ClinicalIRM for the development of an expanded access protocol for ZMapp in West Africa
- Support the use of the product and collection of data in Sierra Leone, Liberia, Guinea
- Involved partnership with local governments



Zika



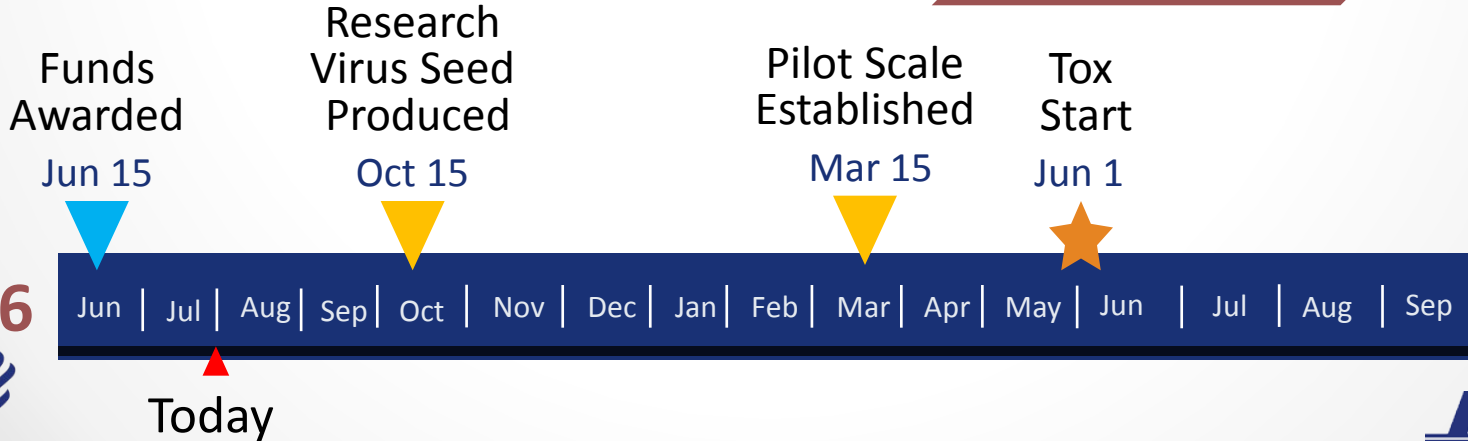
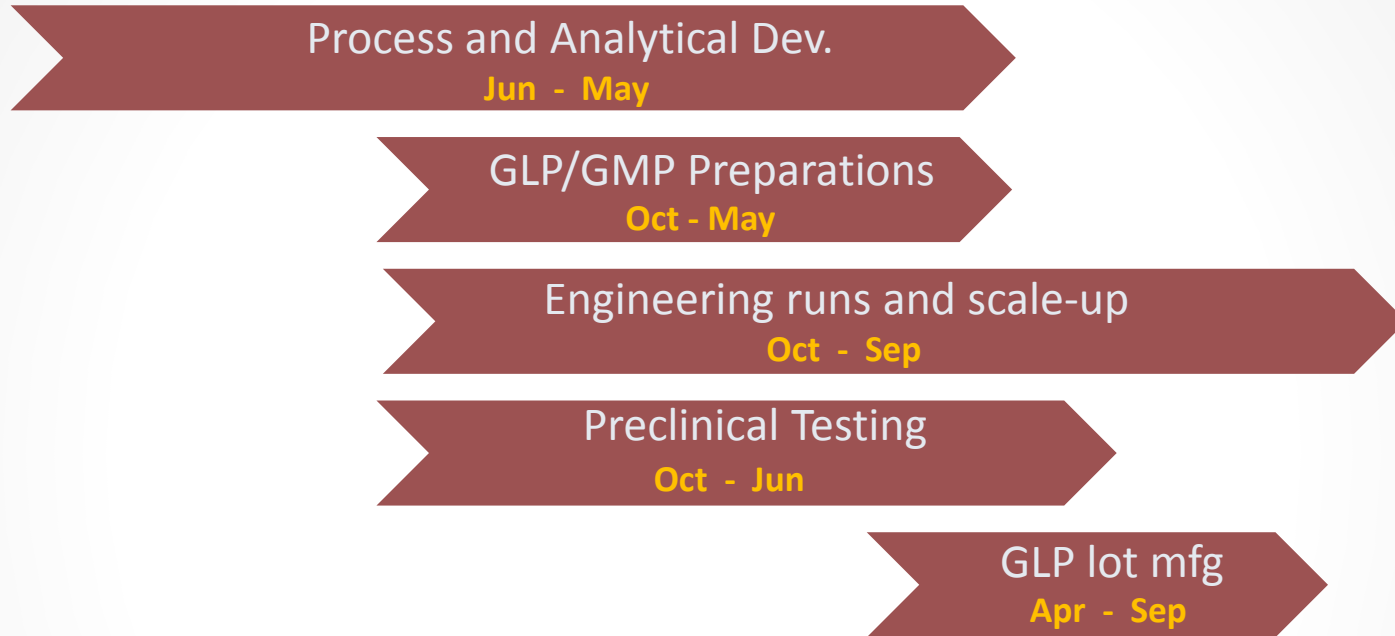
Instituto Butantan

Sao Paulo, Brazil

- State funded company producing vaccines and antitoxins- products acquired to date by tech transfer from other Pharma companies
- Subaward from WHO from HHS/BARDA cooperative agreement for pandemic influenza vaccine development expanded (\$3M) to include other emerging diseases such as Zika
- First attempt to develop a vaccine on their own and the company is severely resource constrained; BARDA is providing as much technical guidance as possible
- Initial goal of grant is to provide a vaccine candidate for tox studies and establish an inactivated virus cell based platform for response



Butantan Zika Vaccine Plan



AMR/CARB



CARB-X



C A R B X



A portfolio of
~20 antibacterial
candidates

Private sector
approach to
funding/portfolio
management

A minimum of 2
candidates
progress to
clinical
development



wellcometrust



AZ: BARDA: IMI partnership



Clinical Trials Network

wellcometrust



**Review on
Antimicrobial
Resistance**

Tackling drug-resistant infections globally



ASPR
ASSISTANT SECRETARY FOR
PREPAREDNESS AND RESPONSE

Clinical Trial Network

A 6-month run-in period. Resolve potential problems. All patients assigned to same drug.

Notional *clAI network*

Down periods. No new drugs to test

Period (n)	P1 (n=250)	P2 (250)	P3 (400)	P4 (250)	P5 (500)	P6 (125)
Control #1	250	150	250	250	100	125
Test #1		100	50		300	
Test #2			100			
Test #3					100	

150-patient on Test #1 as
a P2 study vs. a control

300 patients on Test #1 as
a P3 study vs. a control

100 patients on Test #2 as
P2 study vs. a control

A 100-patient P2 study of
Test #3 vs. a control

Clinical Trials Network

- Focus on Phase 2 and Phase 3 registrational, not investigational trials for body site indications (cIAI, cUTI, HABP/VABP)
- May serve as an incentive for companies to return to antibiotic development
 - Known infrastructure to conduct clinical trials may lower barriers of entry
- Would utilize a common master clinical protocol
 - All investigational products compared to SOC in one control arm
 - Reduce patient enrollment
 - Reduce cost by an estimated 30-40% (McDonnell and Rex 2016)





TATFAR

- BARDA is a member of the Trans-Atlantic Task Force on Antimicrobial Resistance (TATFAR)
- Joint US:EU/Canada Norway partnership to coordinate efforts on AMR
- BARDA is working towards building consensus internationally on economic incentives for antibacterial drug development
- See Sciarretta et al., 2016 CID



For EID preparedness

- Need dedicated strategic partnerships with global pharmaceutical companies that possess multiple vaccine and/or monoclonal antibody platforms
- Continually work towards preparedness for established threats
- Be ready to respond to newly emergent threats
- Financed thru global collation of partners
 - Need to think about pull incentives in the context of this model



Partnerships

- BARDA has established a successful track record of international partnerships
- New partnership models are needed to effectively prepare for and respond to EIDs
- International and partnerships with NGOs will play a key role going forward
- Encourage you, as our industry partners, to be proactive in facilitating these partnerships



Thank you

