CBRN ADVANCED RESEARCH & DEVELOPMENT AND PROJECT BIOSHIELD (2004-2011)

Biomedical Advanced Research and Development Authority

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ARE WE PREPARED?
OVERVIEW

• BARDA Mission and Vision
• CBRN Drug Development Through the Years
• Key CBRN Legislation
• Implementation Plan and MCM Review
• Project BioShield Update
• New CBRN Portfolio and Strategies
BARDA MISSION

Ensure the availability of countermeasures to address public health emergencies

- Three threat areas: Chem/Bio/Rad/Nuc, Pandemic Influenza, Emerging Infectious Diseases
- Comprehensive portfolio approach to development and acquisition of products
- Unique niche in USG biomedical R&D
  - Mid- to late-stage product development
  - Work with industry to progress product candidates through the pipeline
  - Staff with experience in product development and manufacturing
BACKGROUND

• MCM development is characterized by a severe market failure
  – Drug development is extraordinarily expensive, takes a very long time, and is associated with a great deal of risk
  – Medical countermeasures (MCMs) address critical threats to national security but have limited if any commercial value or markets

• The Special Reserve Fund of Project BioShield was established by Congress to provide a market guarantee to counter this market failure
  – Project BioShield also seeks to expedite MCM R&D and enhance the availability of needed products by providing FDA the authority to issue Emergency Use Authorizations for unlicensed products

• The goals of Congress were to
  – Provide the necessary funds and authority to address pressing public health and national security needs; and
  – Foster the development of a robust biodefense industry
CHALLENGE OF DRUG DEVELOPMENT

**TIMELINE**

- 3-7 yr
- 0.5-2 yr
- 1-2 yr
- 2-3.5 yr
- 2.5 yr
- -4 yr
- yrs

**PHASES**

- Discovery
- Preclinical Development
- Phase I
- Phase II
- Phase III
- Licensure
- Production & Delivery

**PRODUCT PIPELINE**

- Probability of Success:
  - 5-10%
  - 25-50%
  - 60-75%
  - 40-60%
  - 70-90%
  - 90-95%

**CHALLENGE OF DRUG DEVELOPMENT**
CIVILIAN BIODEFENSE

• Chapter 1: pre-9/11, 1950s – 2001
• Chapter 2: post-9/11 to Project BioShield, 2001 – 2004
• Chapter 3: Project BioShield and PAHPA, 2004 – 2006
• Chapter 4: ASPR, BARDA & H1N1, 2007 – 2009
• Chapter 5: Enterprise Transformation, 2010 →
PROJECT BIOSHIELD 2004

Accelerated R&D:
Provided NIH/NIAID with new authorities for review and award of support for R&D of MCM.

Availability:
Established Emergency Use Authorization for medical products – use of unlicensed products, or alternative uses of licensed products.

Acquisition:
Established secure funding source from FY04-FY13 for purchase of CBRN security countermeasures.

Authorized the $5.6B Special Reserve Fund that had been established in the FY04 DHS Appropriations Bill (P.L. 108-90)

Virtually all risk placed on the manufacturer. Pipeline of product candidates not as mature as had been envisioned. Market guarantee attracted primarily small biotech firms.
Title IV: Pandemic and Biodefense Vaccine and Drug Development

- Establishes the Biomedical Advanced Research and Development Authority (BARDA) to
  - Facilitate collaboration among USG, industry, and academia
  - Support the advanced research and development of MCMs
  - Promote innovation to reduce time and cost of MCM

- Establishes the Biodefense MCM Development Fund (Advanced Development)
  - Fund development of products across so-called “Valley of Death”
  - Authorizes (not appropriated) $1.07 billion for FY2006-2008
    - Reflects existing commitments in biodefense and pandemic flu initiatives
  - Separate from the preexisting BioShield Special Reserve Fund

- Reforms to BioShield procurement program / New Authorities
  - Advanced payments
  - Milestone payments
  - Anti-trust exemption
**Near-Term FY 2007-08**
- Broad-Spectrum Antibiotics
- Anthrax Vaccines
- Smallpox Vaccines
- Therapeutic Drugs for Acute Radiation Injury

**Mid-Term FY 2009-13**
- Broad-Spectrum Antibiotics
- Diagnostics
- Anthrax Antitoxins
- Filovirus MCMs
- Smallpox Antivirals
- MCMs for ARS and DEARE
- Radionuclide-Specific MCMs
- Rad/Nuc: Biodosimetry/Bioassays
- Enterprise CHEMPACKS

**Long-Term Beyond FY 2013**
- Broad-Spectrum Antivirals
- Volatile Nerve Agent Antidotes

**Pillar 4**
Determine Near-, Mid-, and Long-Term Development & Acquisition Strategies
Key Initiatives

1. Expand Product Pipeline through Concept Acceleration Program (CAP) at NIAID

2. Establish a Strategic Investment (SI) Fund to increase investments in commercial ventures with multi-use potential (BARDA & NIAID)

3. Establish Centers for Innovation in Advanced Development and Manufacturing (BARDA)

4. Investment in upgrading science capacity at FDA
“Our Nation must have the nimble, flexible capacity to produce MCMs rapidly in the face of any attack or threat, known or unknown, including a novel, previously unrecognized naturally occurring emerging infectious disease”

If a product fails, it should only be the result of failure of the product to achieve the desired safety or efficacy thresholds, and not as a function of our inability to provide the proper support from a technical, business and regulatory perspective
Material Threat = “sufficient to affect national security”

Radiological and Nuclear agents

*Bacillus anthracis* (anthrax)
*Bacillus anthracis* - multi-drug resistant (MDR anthrax)
Botulinum toxins (botulism)
Variola virus (smallpox)
*Yersinia pestis* (plague)
*Franciscella tularensis* (tularenia)
Hemorrhagic Fever Viruses - Ebola, Marburg, Junin
*Burkholderia mallei* (glanders)
*Burkholderia pseudomallei* (meliodosis)
*Rickettsia prowazekii* (typhus)

Volatile nerve agents [determination in progress]
PROJECT BIOSHIELD PRODUCTS

Smallpox

Anthrax

Radiation
INTEGRATED PORTFOLIO FOR CBRN MEDICAL COUNTERMEASURES REQUIREMENTS

**DoD-Unique**
- Brucellosis Vx
- VEE/EEE/WEE Vx & Rx
- Plague Vx
- Botulism Vx
- SEB Vx & Rx
- Tularemia Vx
- Ricin Vx & Rx
- (other, unfunded)

**HHS-Unique**
- Smallpox Vx for special populations
- Burkholderia sp. Rx
- Junin Rx
- Plague Rx

**Common**
- Anthrax Vx & Rx
- Smallpox Vx & Rx
- Ebola / Marburg Vx & Rx
- Tularemia Rx
- Botulism Rx
- Radiation Rx
- Nerve agent Vx & Rx

*DoD focus is on protecting forces prior to exposure. HHS focus is on response to threats to general civilian population after exposure.*

Vx = Prophylaxis  
Rx = Therapeutic
NEW PIPELINE OF PRODUCTS

• Anthrax
  – Vaccines – novel adjuvants and formulations
  – Antitoxins enhanced affinity

• Smallpox
  – Antivirals
  – Vaccine enhancement

• Hemorrhagic fever viruses
  – siRNA-based antivirals
  – Post-exposure prophylactic vaccines

• Broad-spectrum antimicrobials
  – Inhalational delivery systems

• Radiation/Nuclear
  – Therapeutics: acute radiation syndrome & thermal burns
  – Decorporation agents

• Biodosimetry
  – Devices and assays
PUBLIC/PRIVATE PARTNERSHIPS FOR ANTIBIOTIC DEVELOPMENT

News Release

FOR IMMEDIATE RELEASE
Monday, August 30, 2010

BARDA funds drug development for biothreats, antibiotic resistance

$27-$64 million contract supports development of novel antibiotic with multiple uses

The U.S. Department of Health and Human Services’ Biomedical Advanced Research and Development Authority (BARDA) today awarded a contract to develop an antibiotic that could be used against possible two types of bioterrorism as well as common infections that are becoming resistant to antibiotics.

The contract to Achaogen Inc. of San Francisco is for $27 million in the first two years. The contract can be extended annually for up to three years for a total of $64 million.

The planned antibiotic, ACHN-490, would be a broad-spectrum antibiotic to treat plague and tularemia infections, both of which are possible bioterrorism agents. The antibiotic also could treat many infections that are becoming resistant to antibiotics. Antibiotic-resistant infections include some of the infections people get when they are hospitalized, including pneumonia from prolonged use of a ventilator and urinary tract infections from using a catheter for an extended period of time. Also under the contract, the company will conduct studies to show that the new antibiotic is safe for children, the elderly, and other special populations.

The contract uses the federal government’s new approach to producing medical countermeasures – the medications, vaccines, medical equipment and supplies needed for a health emergency. On Aug. 19, HHS Secretary Kathleen Sebelius released an examination of the federal government’s system to produce medical countermeasures, along with recommendations for a better approach. The recommendations included developing drugs that can be used for bioterrorism as well as common illnesses, and to develop more countermeasures that are safe for children, the elderly, and other vulnerable populations.

“This new antibiotic is part of our push against antibiotic resistance for certain bacterial infections, and at the same time could provide a new treatment for plague and tularemia biothreats,” said BARDA Director Dr. Robin Robinson. “It’s the first time BARDA research and development funds have been used in a multi-use approach like this.”

The contract is the first under BARDA’s Broad Spectrum Antimicrobial Program, one of six areas of advanced research and development that use a contracting tool called a broad agency announcement. The broad agency announcement provides a way to identify innovative and promising technologies that can be developed to protect Americans from chemical, biological, radiological and nuclear threats.
ENHANCING ANTHRAX VACCINE MANUFACTURING CAPACITY

MedicalCountermeasures.gov

ASPR Awards $54 Million to Support Making Anthrax Vaccine in U.S.

July 13, 2010

The U.S. Department of Health and Human Services’ Assistant Secretary for Preparedness and Response today announced a $54 million multiple-year contract with Emergent BioDefense Operations Lansing (EBOL), a subsidiary of Emergent BioSolutions Inc., to support the development of domestic manufacturing capacity for anthrax vaccine.

The contract supports development of a process to manufacture vaccine in the company’s Lansing, Mich., facility by funding studies to support validation of the process and by funding scientific studies of the safety and effectiveness of vaccine manufactured under this contract. This data will support the filing of a supplement to the FDA license for BioThrax anthrax vaccine manufactured in the new facility. If product is licensed from the Michigan facility, the manufacturing capacity for anthrax vaccine will increase manifold.

“Today we are taking an important step in anthrax preparedness,” said Dr. Robin Robinson, director of ASPR’s Biomedical Advanced Research and Development Authority (BARDA) which will oversee the contract. “The current requirement is to have vaccine available for 25 million people – enough for the largest U.S. cities – in the event of an anthrax incident. This facility will help achieve this goal by building domestic manufacturing capacity for this product.”

The contract also represents a public-private partnership, part of BARDA’s strategy to support public health preparedness and emergency response. In a bioterrorism attack, the nation would need surge capacity to make medications, vaccines, medical equipment and supplies quickly.

BARDA, within the Office of the Assistant Secretary for Preparedness and Response in the U.S. Department of Health and Human Services, provides a comprehensive integrated portfolio approach to the advanced research and development, stockpile acquisition, innovation, and manufacturing infrastructure building of the necessary vaccines, drugs, therapeutics, diagnostic tools, and non-pharmaceutical products for public health medical emergencies including chemical, biological, radiological, and nuclear threats, and pandemic influenza, and emerging infectious diseases.

Information on medical countermeasures, including this contract, can be found at https://www.medicalcountermeasures.gov

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ADVANCED R&D

Science and Technology Platforms Applied to Medical Countermeasure (MCM) Development

BARDA Broad Agency Announcement for Advanced Research and Development of Medical Countermeasures for Pandemic Influenza
BARDA Animal Model Development of Chemical, Biological, Radiological, and Nuclear; Influenza; and Emerging Infectious Disease Medical Countermeasures

Solicitation Number: FP-001-10-000011
Notification Type: Solicitation

Synopsis:
The Department of Health and Human Services (HHS) through the Biomedical Advanced Research and Development Authority (BARDA) requires the development of animal models for the development of medical countermeasures for Chemical, Biological, Radiological, Nuclear (CBRN), Influenza, and Emerging Infectious Diseases. The mission and priorities of the HHS Public Health Emergency Medical Countermeasures Enterprise (PHEMCE) are articulated in the PHEMCE.

Closes June 29, 2011
INTERFACING WITH BARDA

• **www.phe.gov**
  — Program description, information, news, announcements

• **www.medicalcountermeasures.gov**
  — Portal to BARDA
  — Register, request a meeting
  — Tech Watch

• **www.fedbizopps.gov**
  — Official announcements and detailed information about all government contract solicitations

[www.fbo.gov]