NIAID Biodefense Research

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NIH Biodefense Research Funding, FY 2000-2004

- 2000: $0
- 2001: $0
- 2002: $274.5M
- 2003: $1.497B (Budget Appropriation)
- 2004: $1.625B (P.B.)
Biodefense Research: A Delicate Balance

Investigator - Initiated Scientific Concepts

Programmatic Direction to Guide Countermeasures Development
Biodefense Research Priorities and FY03 NIH Budget

- Basic Research (including Genomics): $297M
- Expansion of Research Capacity: $746M
- Diagnostics: $27M
- Therapeutics: $90M
- Vaccines: $337M

Total: $1.497B
Basic Research in Biodefense: Progress and Priorities

Pathogenesis

- Microbial Physiology and Ecology
- Genomics/Proteomics
- Animal Models
- Host Defenses
Biodefense Vaccine Research: Goals

- Protect all groups of civilians
- Develop improved vaccines against microbes for which vaccines currently exist
- Develop new/novel vaccines against microbes for which none currently exist
A “Next-Generation” Smallpox Vaccine: Modified Vaccinia Virus Ankara (MVA)

- Highly attenuated vaccinia virus
- Cannot replicate in most mammalian cell lines, however in animal models elicits a significant immune response
- Historically, good safety profile, including at-risk groups
  - German smallpox vaccination experience (n= ~120,000)
  - Experimental cancer, HIV vaccines
- Intramuscular injection rather than scarification
- Several candidates in development; most promising will be tested by NIAID at Vaccine Research Center and in network of Vaccine and Treatment Evaluation Units
Biodefense Therapeutics Research: Progress and Priorities

Screening

New Targets

Drug Resistance

Broad-Spectrum Therapies

FY 2003 $90M
NIAID Scientific Accomplishments in Biodefense: Therapeutics

- Screened 650 antiviral compounds against 9 orthopoxvirus targets
- Identified new target sites for anthrax toxin
- Prepared and submitted treatment IND for cidofovir
- Developed new encephalitis animal model for testing of drugs against flaviviruses
- Evaluating currently licensed antibiotics against Category A bacteria (plague, anthrax)
- Determining the pharmacokinetics of toxin/antitoxin (3 forms and 3 serotypes) against botulism in several animal models
- Conducted clinical trial of therapies for cryptosporidiosis
Treating Smallpox Vaccination Complications

Vaccinia Immune Globulin (VIG)

Cidofovir
Medical Diagnostics for Biodefense

In vivo molecular imaging

Inhaled biological radiotracers

Integrated systems/platforms for screening and detecting multiple agents

Nanotechnology

FY 2003 $27M
NIAID FY03 Biodefense Research: Research Resources

- Animal Model Development – $40M
- Regional Centers of Excellence for Biodefense and Emerging Infectious Diseases Research – $30M
- Centers of Human Immunology – $17M
- National Biocontainment Laboratories/Regional Biocontainment Laboratories – $375M
- Biodefense and Emerging Infections Research Resources Program – $15M
- Training Programs – $10M
Models for Partnering with Industry on Biodefense Research

- Partnerships For Biodefense
- Collaborative Research for Drugs, Diagnostics, Immunotherapeutics, Vaccines and Adjuvants
- SBIRs
- Research Resources (e.g. RCEs, Repositories, Animal Models)
- Vaccine Production Contracts
  - rPA
  - MVA
Deadly Ebola, Avian Influenza Re-emerging

The World Health Organization announced Wednesday that two particularly deadly viruses have been reemerged: Ebola and an unusual form of avian influenza that is lethal to humans.
NIAID Biodefense Research

About Biodefense
- Director’s Statement
- National Biodefense Effort
- NIAID’s Role
- Leadership
- Careers

For Researchers
- Strategic Plan
- Funding
- Resources
- Upcoming Meetings

For the Public & the Media
- Fact Sheets and Overviews
- Clinical Trials
- Biocontainment Lab Tour
- News Releases
- Resources

http://biodefense.niaid.nih.gov