

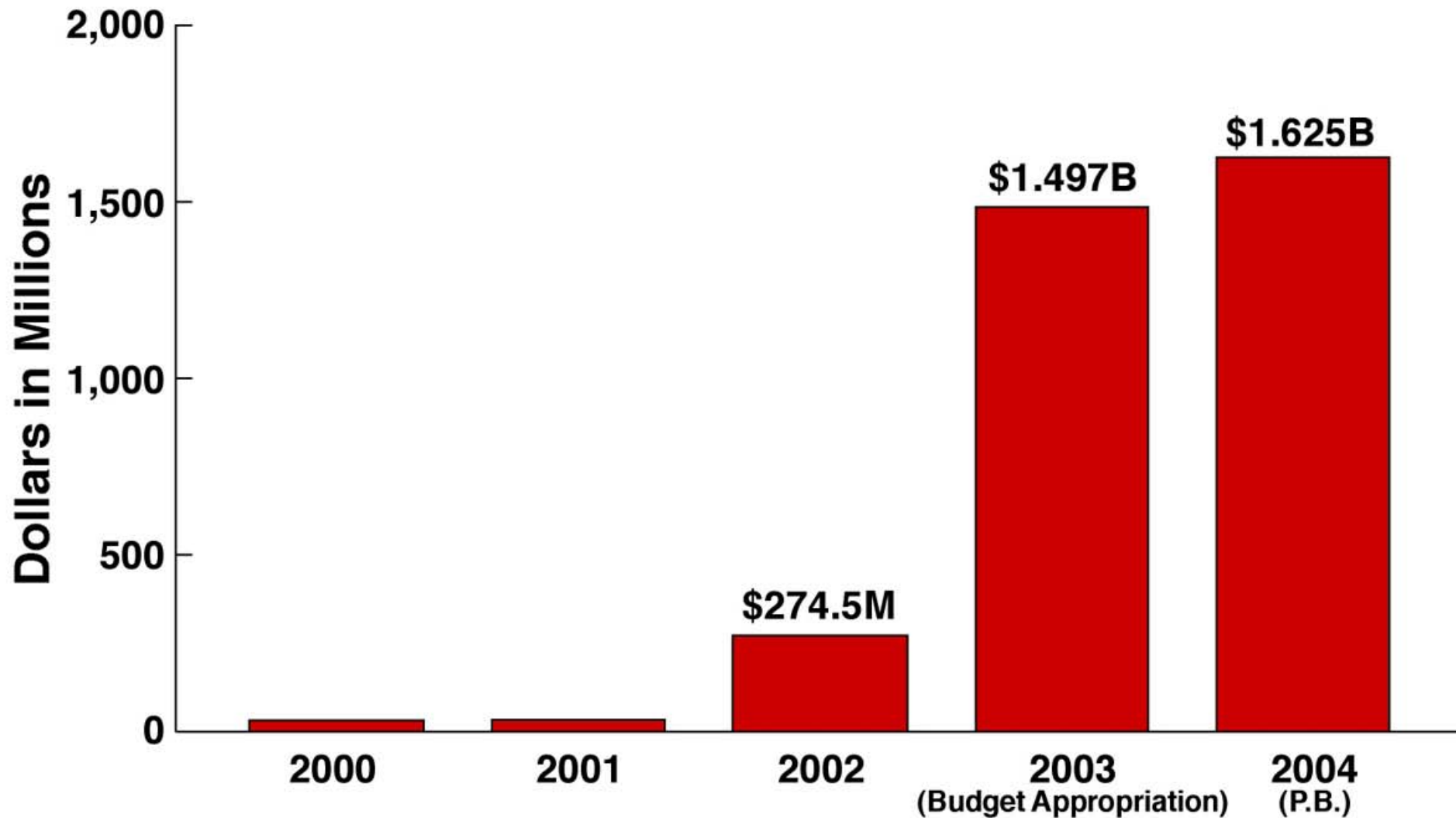
NIAID Biodefense Research

Jack Killen, M.D.

**Assistant Director, NIAID & Head, Office of Biodefense Research
National Institutes of Health
Department of Health and Human Services**



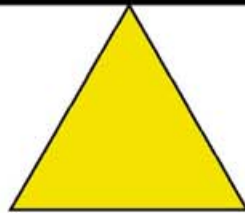
NIH Biodefense Research Funding, FY 2000-2004



Biodefense Research: A Delicate Balance

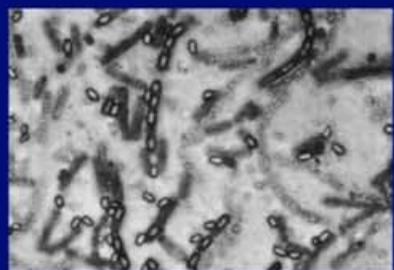
**Investigator -
Initiated
Scientific
Concepts**

**Programmatic
Direction to Guide
Countermeasures
Development**



February 2002

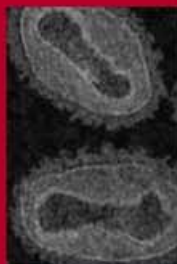
NIAID Strategic Plan for Biodefense Research



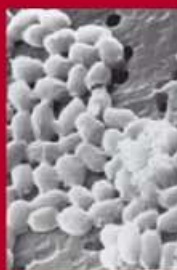
 National Institute of Allergy and Infectious Diseases
NATIONAL INSTITUTES OF HEALTH

February 2002

NIAID Biodefense Research Agenda for CDC Category A Agents



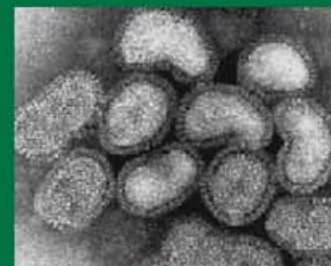
Responding
Through
Research



 National Institute of Allergy and Infectious Diseases
NATIONAL INSTITUTES OF HEALTH

January 2003

The NIAID Biodefense Research Agenda for Category B and C Priority Pathogens



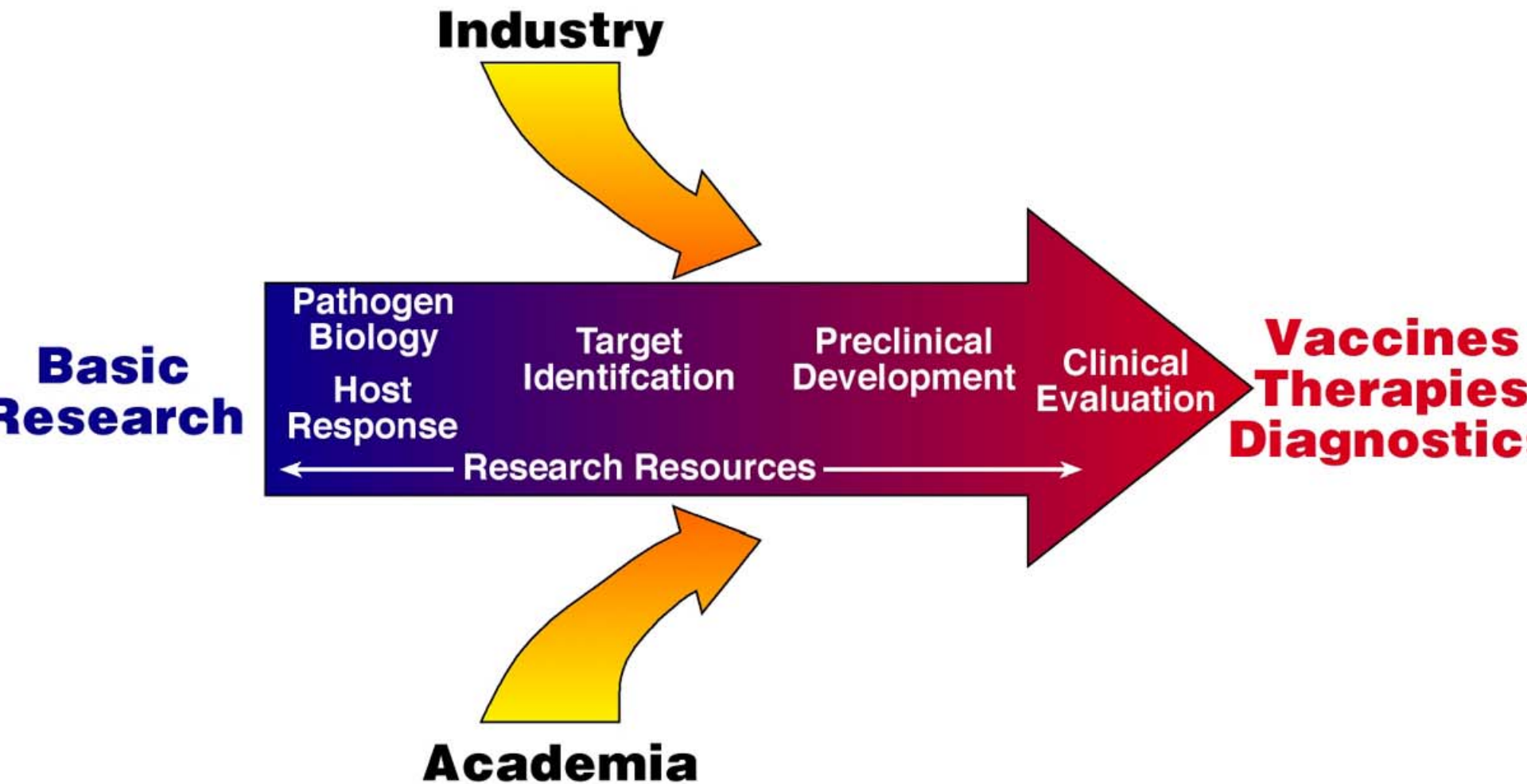
Responding
Through
Research



 DEPARTMENT OF HEALTH AND HUMAN SERVICES
 National Institute of Allergy and Infectious Diseases
NATIONAL INSTITUTES OF HEALTH

<http://biodefense.niaid.nih.gov>

NIH Biodefense Research Pathway





\$1.497 Total



**Basic Research
(including
Genomics)
\$297M**

**Expansion of
Research
Capacity
\$746M**

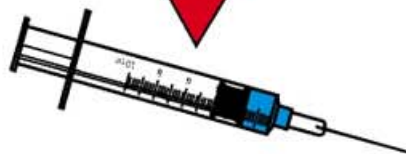


**Biodefense
Research
Priorities and
FY03 NIH
Budget**



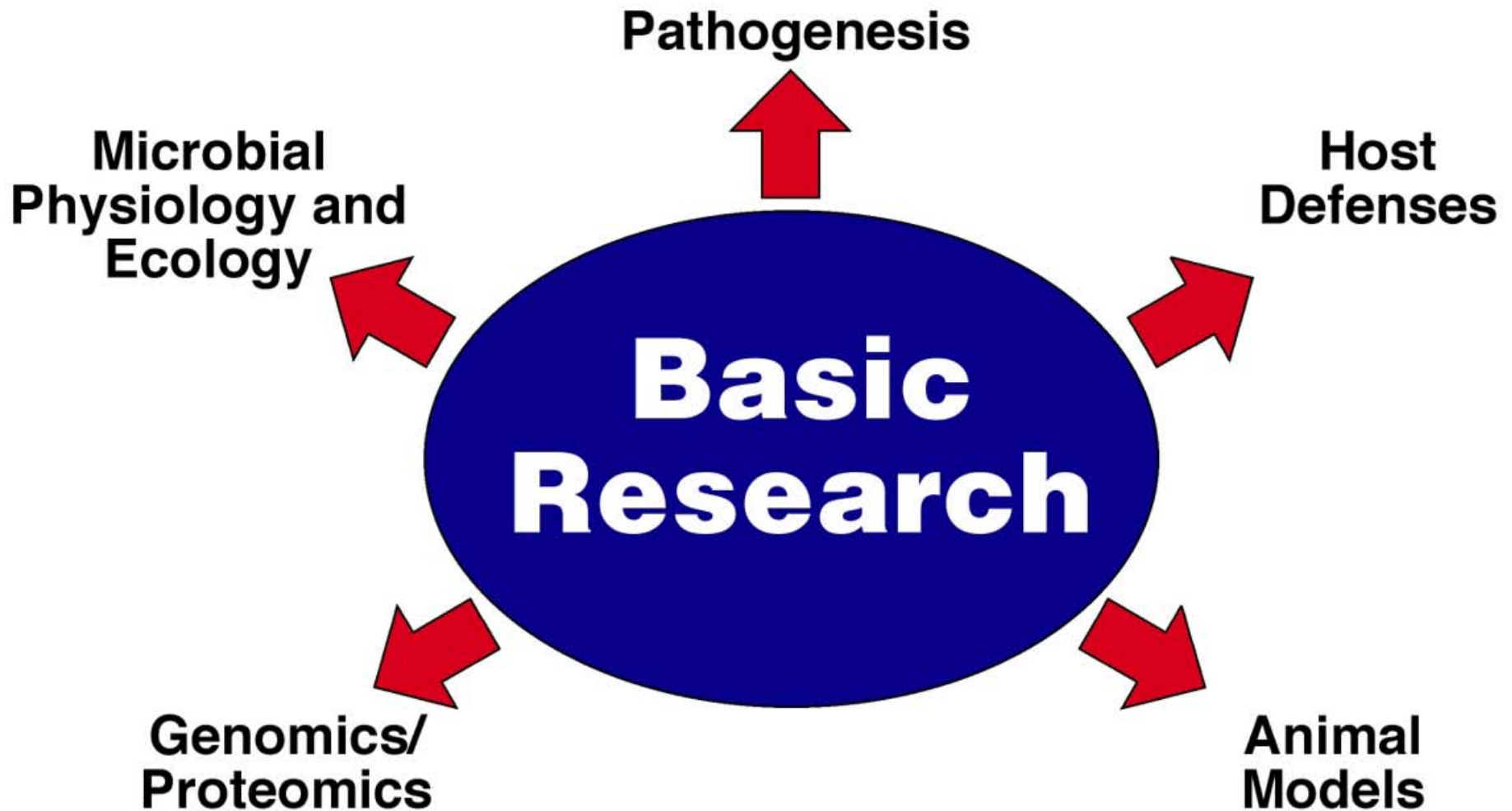
**Diagnostics
\$27M**

**Therapeutics
\$90M**



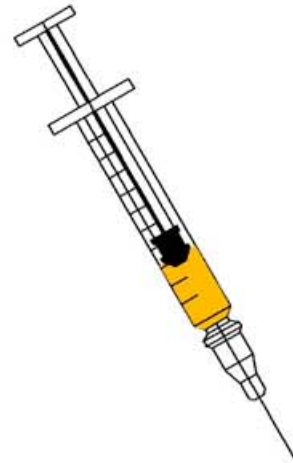
Vaccines \$337M

Basic Research in Biodefense: Progress and Priorities



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

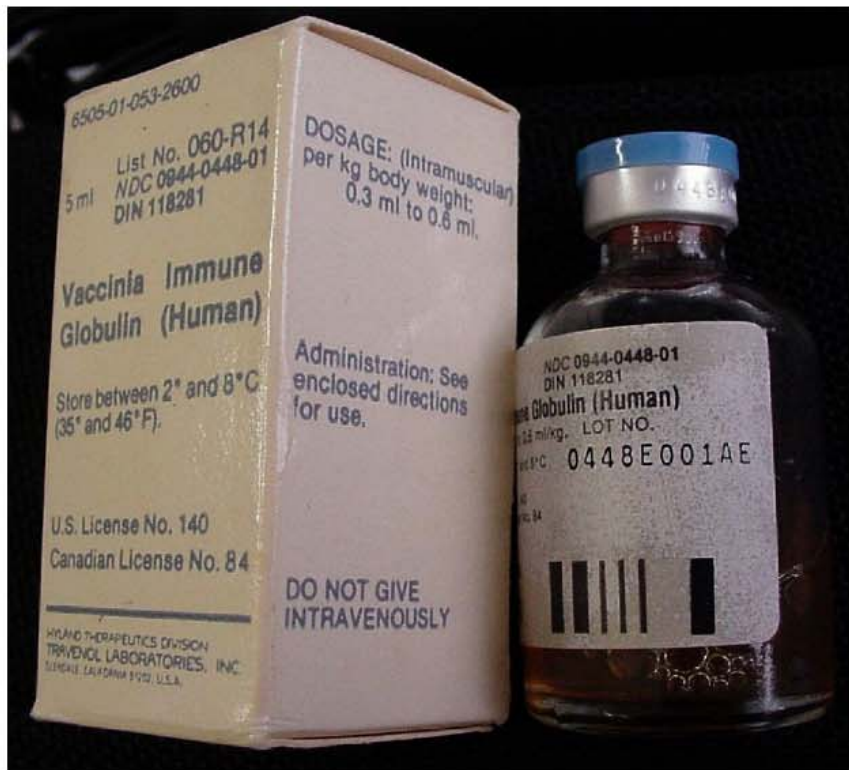
Broad-Spectrum
Therapies

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

Newsday

February 20, 2003

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



**NIAID
BIODEFENSE**
Preparing Through Research

<http://biodefense.niaid.nih.gov>

