



Chemical and Biological Defense Program (CBDP): Capabilities for Countering the Threat

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Director, CBRN Integration

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Outline



- **Recent Highlights**
- **Program Organization**
- **Program Guidance and Direction**
- **Summary**





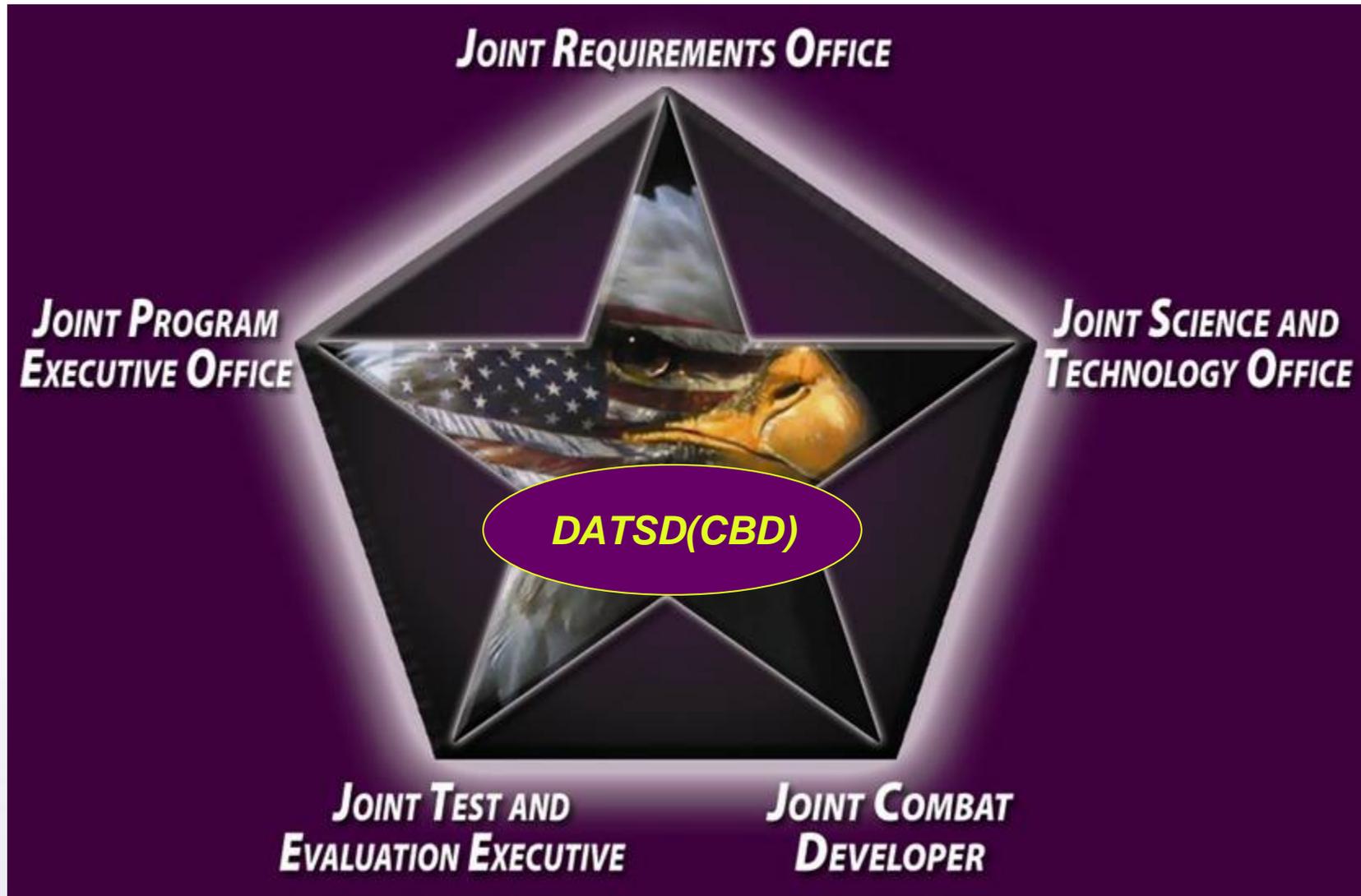
CBDP: Great News Story



- **FY06 Budget submission**
 - First input under new management structure
 - First alignment of life-cycle cost and testing (from science & technology through acquisition)
 - Major T&E Investment
 - Moving more into experimentation & rigorous analysis
- **Significant Interagency Collaboration**
- **One of Few Growth Areas in DoD Budget**
 - \$2.1 Billion Increase over FYDP in President's Budget
 - Aligns with President's Global War on Terror
 - Increased Emphasis in Future Technologies
 - **High Investment in S&T in FY06**
 - Infrastructure Rebuild
 - Non-Traditional Agents
 - Genetically Engineered Threats
 - New Sensor Approaches
 - Systems Biology Approach to Medical Countermeasures



Chemical and Biological Defense Program (CBDP) Program Organization





CBDP Major Players



Dr. Dale Klein
ATSD(NCB)



Dr. Klaus Schafer
DATSD(CBD)



Dr. Barry Fridling
JRO-CBRND
(Acting)



BG Steve Reeves
JPEO-CBD



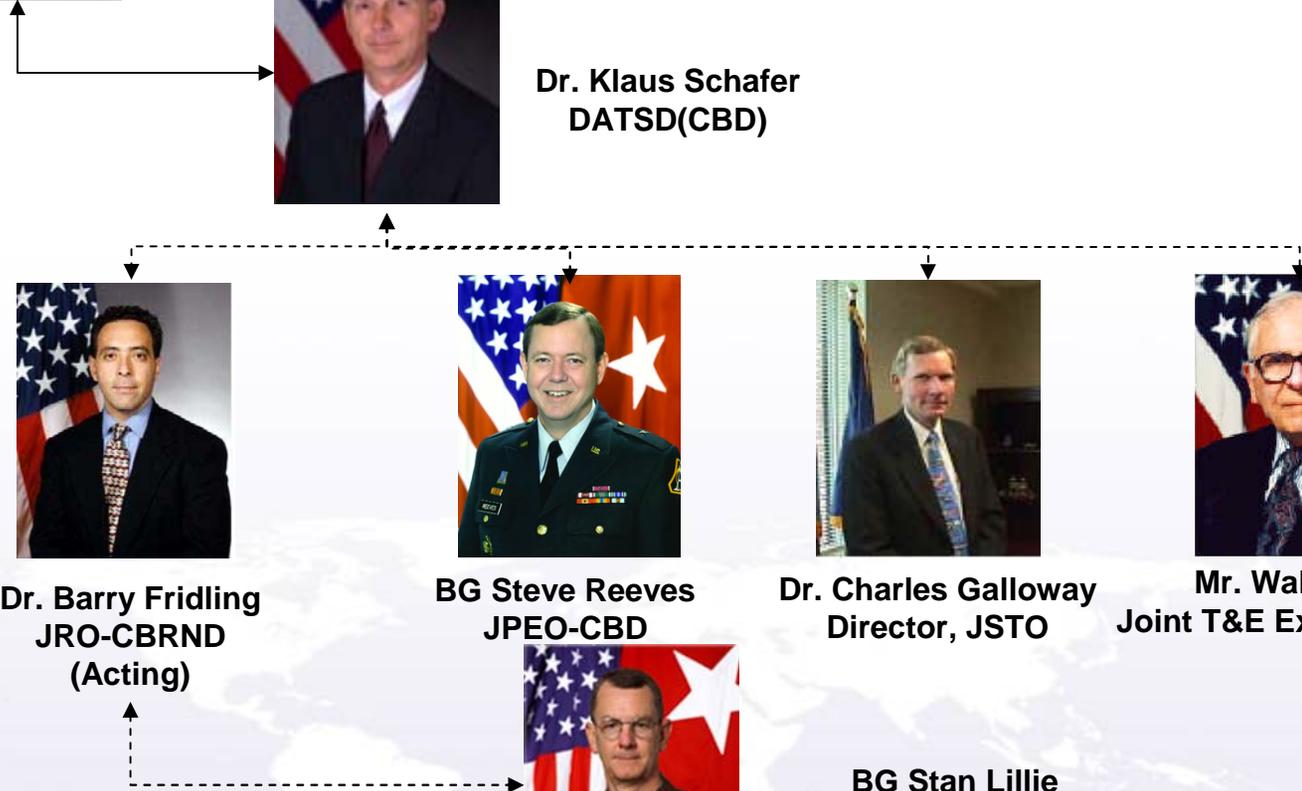
Dr. Charles Galloway
Director, JSTO



Mr. Walter Hollis
Joint T&E Executive Agent



BG Stan Lillie
Joint Combat Developer





An Integrated Systems Approach to Counter the Threat



Sustained Combat Power →

CB Threats & Hazards

Agent Delivery

Doses on Target

Downwind Dispersal

Doses Absorbed

Symptoms



Medical Pretreatment



Individual & Collective Protection



Medical Treatment



Information Systems



Contamination Avoidance and NBC Battle Management (Detection, Identification, Reconnaissance & Warning)



Installation Force Protection



Decontamination, Restoration



CBRN Defense Program Strategic Environment



- Defense of the Homeland
- Global War on Terror
- DOD Role in Bioshield
- Proliferation of Weapons of Mass Destruction
- Challenge of Non-Traditional CBRN Agents
- Biosurety



“The *greatest threat* before humanity today is the possibility of *secret and sudden attack* with *chemical, or biological, or nuclear weapons*”

President George W. Bush
Remarks at the National Defense University, 11 February 2004



Chemical Biological Defense Program Paradigm Shift



Prior to the transformation, the ***major focus*** to provide improved capabilities for the warfighter to survive, fight, and win on any battlefield contaminated with chemical and biological weapons.

The current paradigm shift directs both a ***broadening and deepening*** of the CBDP.

- CBRN consequence management (about 1997)
- Force protection (in 1999)
- Homeland Defense (in 2002)
- Visibility of “radiological and nuclear” aspects of the program (2003)
- Inclusion of the US Coast Guard
- Transition from *Threat Based* to *Capabilities Based* Process

➤ This broadening requires a carefully developed program strategy to ***ensure that warfighter capabilities are maintained and advanced*** concurrently with these added missions.



Chemical and Biological Defense: *Strategic Framework*





DoD Mission



Provide integrated chemical and biological defense capabilities to effectively execute the National Military Strategy.





Strategic Imperatives



- **Eliminate technological surprise.**
- **Make the threat irrelevant.**
- **Detect the threat.**
- **Protect against the threat.**
- **Eliminate the threat.**





Enabling the Vision



- **Doctrine**
- **Organization**
- **Training**
- **Materiel**
- **Leader development**
- **Personnel**
- **Facilities**

Oversight – Coordination – Integration



Transforming

- **New Team Focused on:**
 - **Defining Equities Across DoD**
 - **Streamlining Processes**
 - **Synchronizing Effort**
 - **Improving Efficiency**
 - **Optimizing Capability**
 - **Promoting Interoperability**

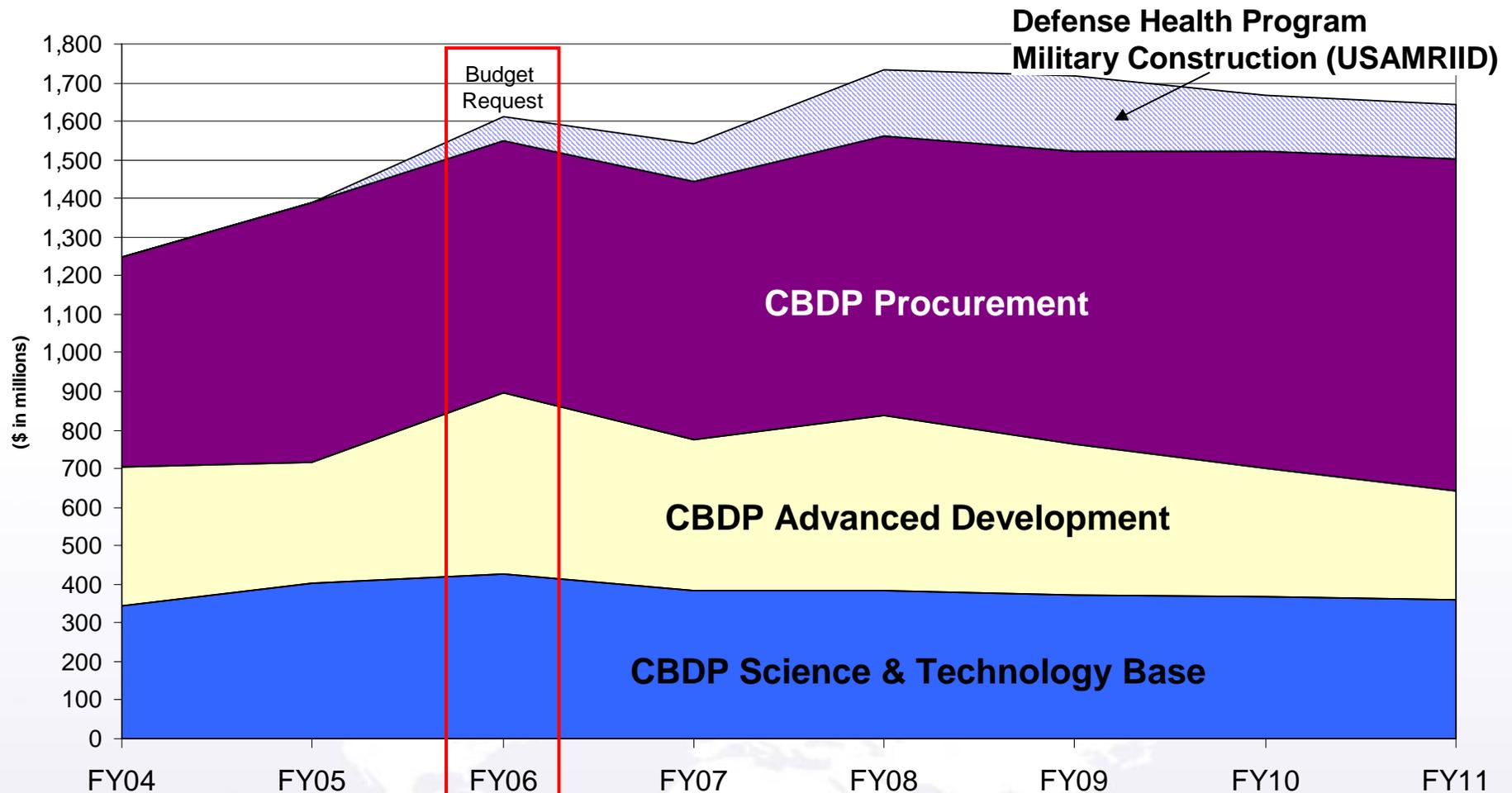


BOTTOM LINE:
EFFECTIVE SOLUTIONS
IN THE HANDS OF THE USER



FY06 President's Budget

(DoD CB Defense Program + Defense Health Program for Construction of USAMRIID Improvements)



FY06 Highlights

- Near-Term Shift in Emphasis to Address Future Challenges (NTAs, Emerging Threats) and Improve the T&E Infrastructure
- Long term trend to Provide Advanced Capabilities to the Warfighter



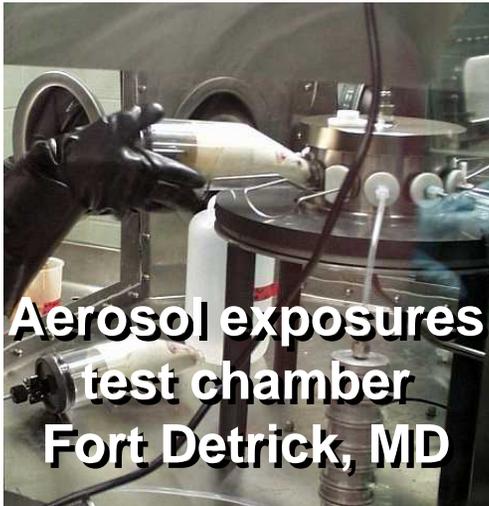
Enhanced Planning Process (EPP) Results



T&E Infrastructure Improvements	RDT&E Improvements
<ul style="list-style-type: none">• CB T&E Facilities• NTA Test Chamber• USAMRIID (DHP)	<p>Additional Emphasis:</p> <ul style="list-style-type: none">• S&T for NTA detection• Bio point and standoff detection• Medical Prophylaxis• Battle Analysis• Decontamination• Bio Defense Initiatives• Chem point detection



T&E Infrastructure Investment

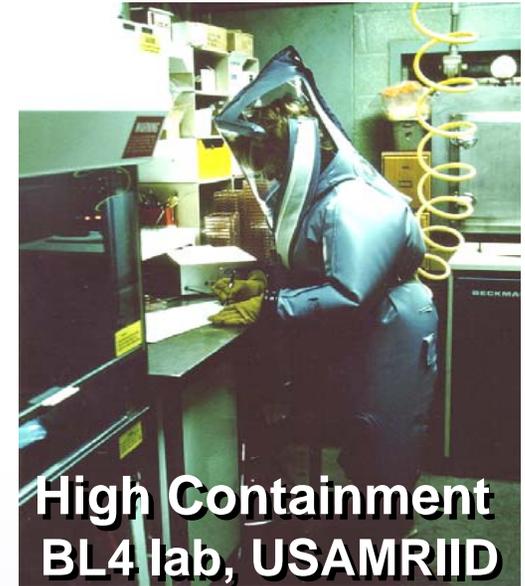


Aerosol exposures test chamber
Fort Detrick, MD



Explosive test (simulant only)

"Bang Box", Dugway



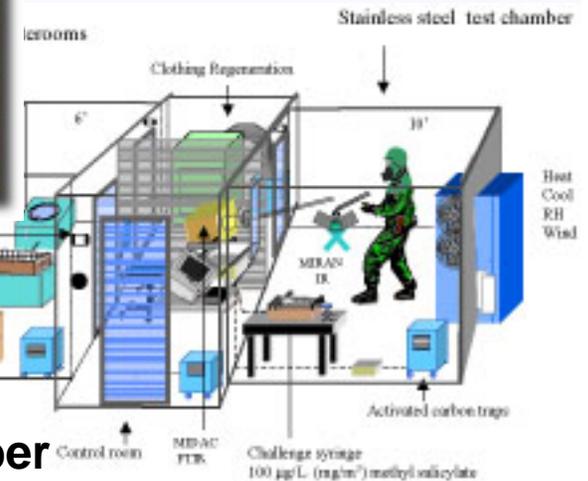
High Containment BL4 lab, USAMRIID
Fort Detrick MD



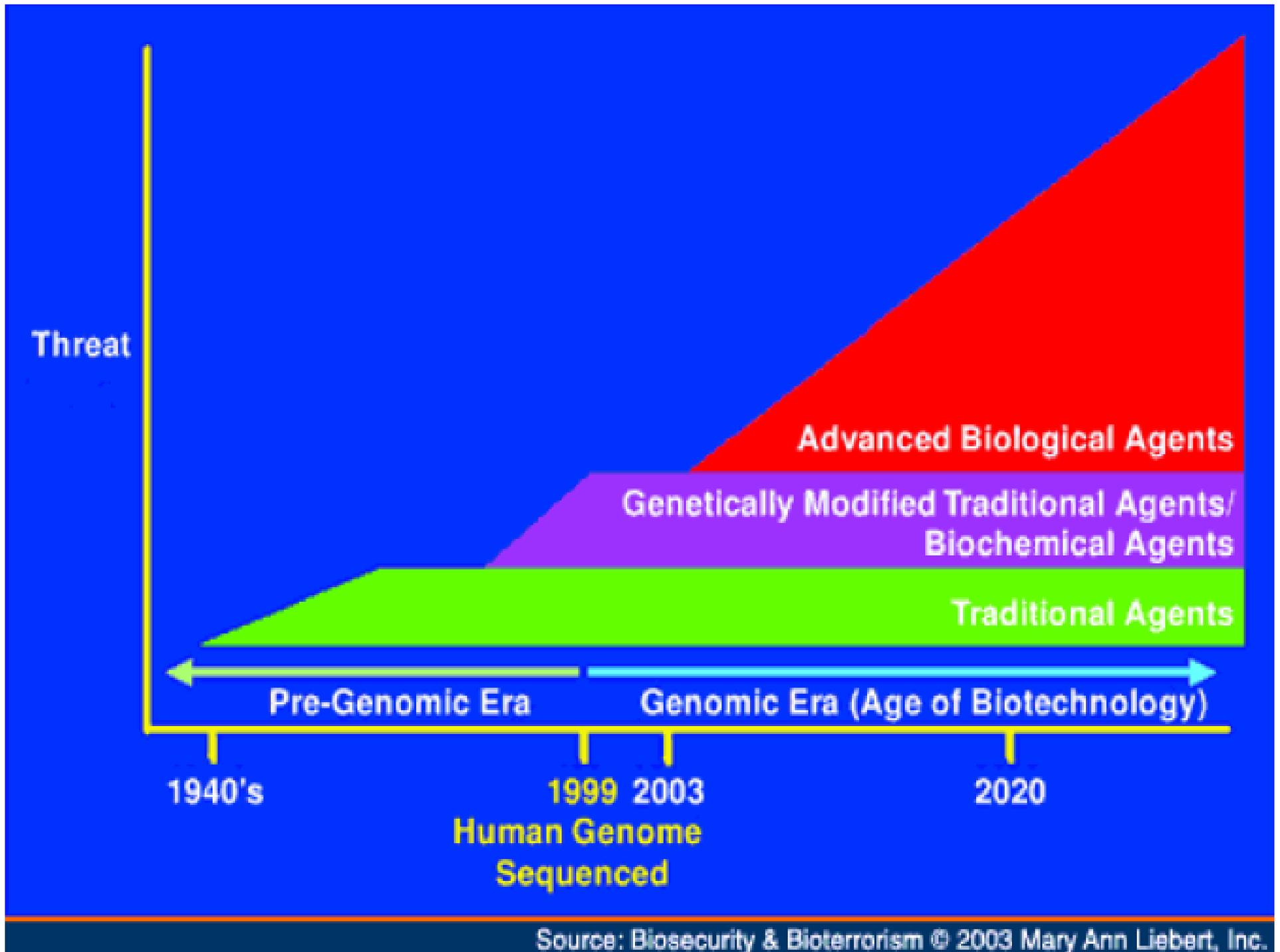
CB Simulant Test Grid
Dugway Proving Ground UT



CB Aerosol Test Chamber
Fort Detrick, MD



Man In Simulant Test (MIST) Chamber





The Problem

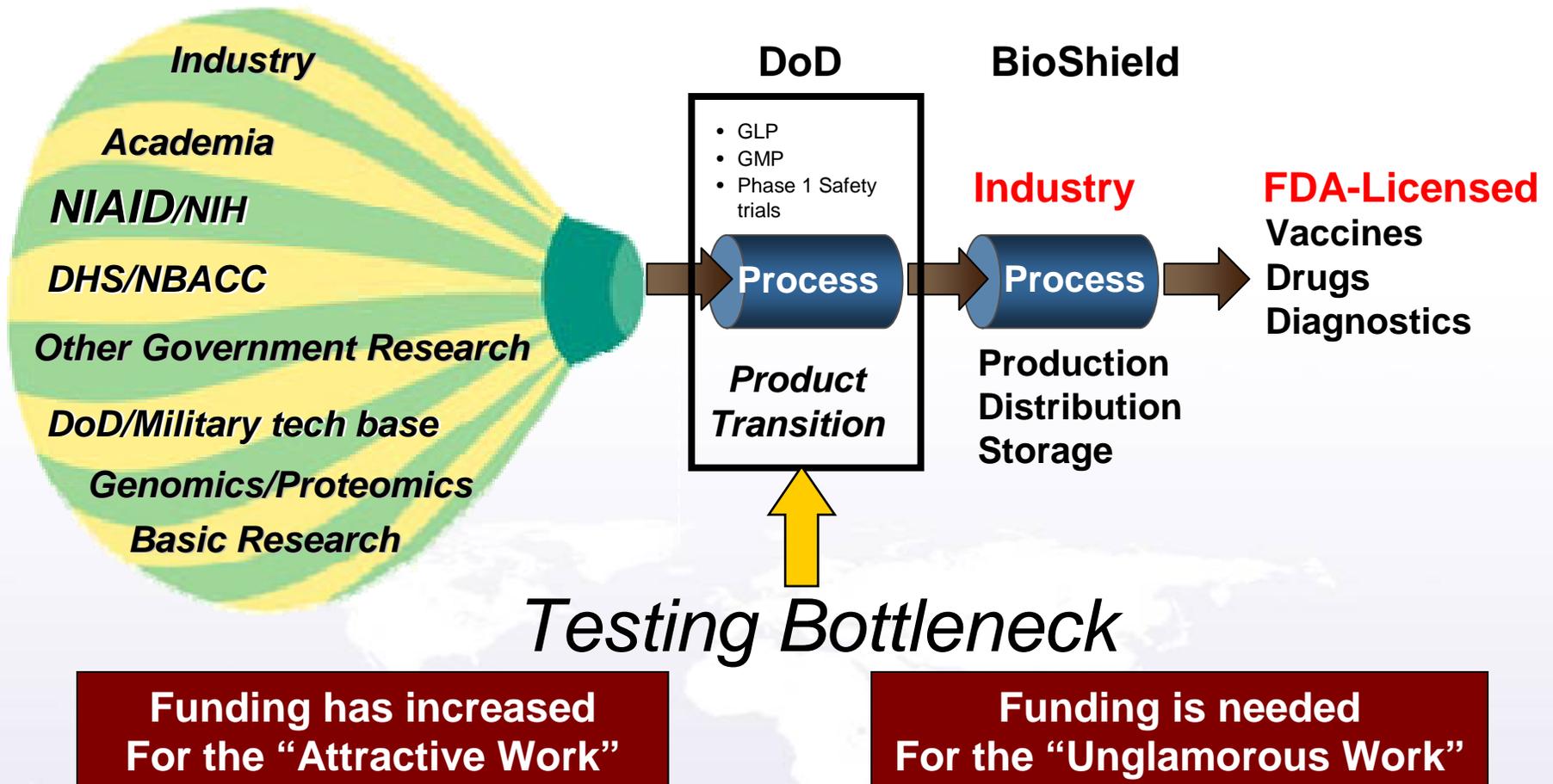
Slow drug development process leads to economic and social catastrophe jeopardizing national security





R&D - Test and Evaluation

Vaccine/Drug Discovery/Vaccine/Drug Development





Future Emphasis: Systems Biology

Today's Threats

- Anthrax*
- Smallpox*
- Botulinum*
- Plague*
- Tularemia*
- Ebola/Filo*
- Hemorrhagic Fever*
- Encephalitis*
- SARS*
- Influenza*
- Ricin/SEB, others*

Modes of Action

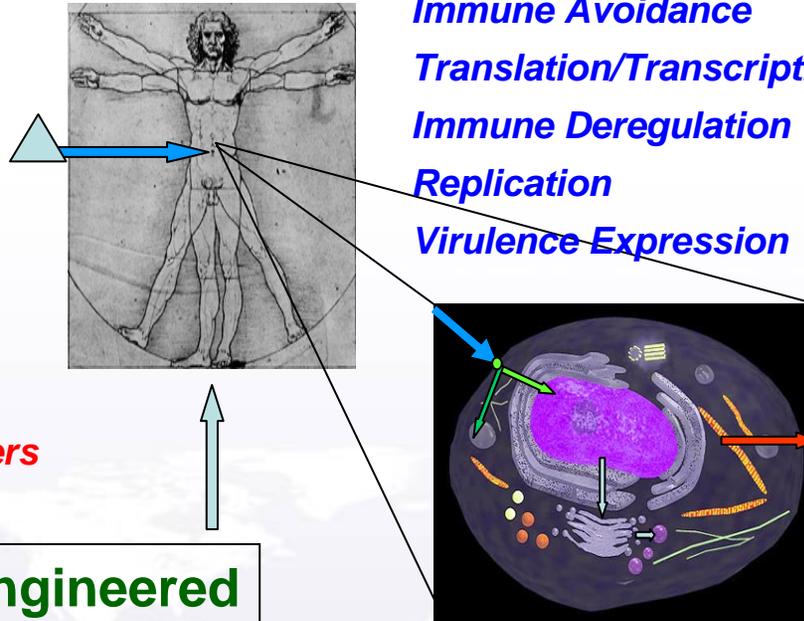
- Receptor Binding*
- Signal Transduction*
- Decoys*
- Immune Avoidance*
- Translation/Transcription*
- Immune Deregulation*
- Replication*
- Virulence Expression*

Parallel Systems Approach

Solutions

Target Agent Commonalities

- Block Key Receptors
- Inhibition by Small Molecules
- Modulate Immunity
- Change Gene Expression
- Block Protein Actions
- Modulate Physiologic Impacts

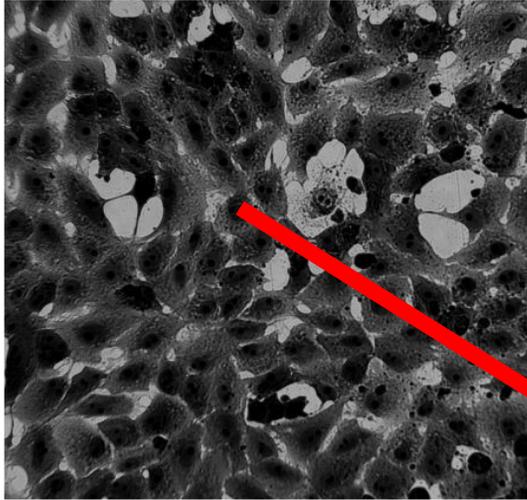


Bioengineered

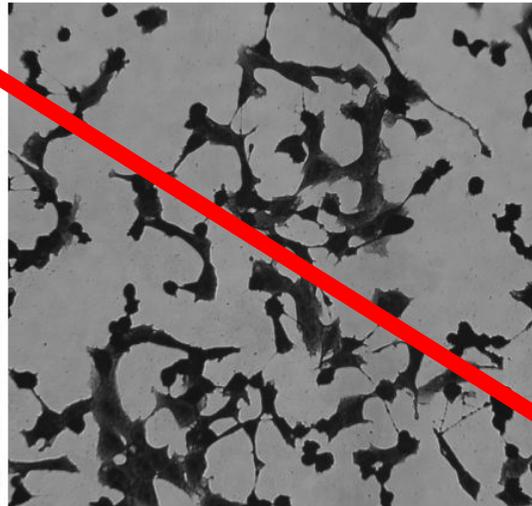
One **PIECE** at a time → Process Analysis → Broad Spectrum



Viral Disease

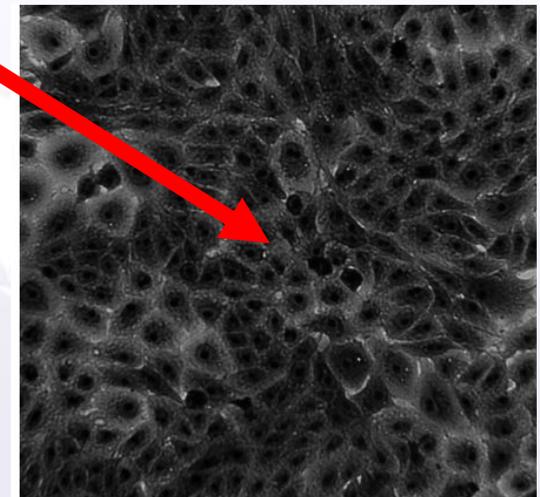


**Healthy Cells
(Untreated)**



**Cells Infected with SARS
(Untreated)**

**Cells Infected with SARS
(Treated with 20 μ M of
TRS2 PMO)**



SARS = Severe Acute Respiratory Syndrome
PMO = Phosphorodiamidate Morpholino Oligomers



Broad Spectrum Therapies for Novel Biodefense Threats



- **\$100M funding in FY06**
 - Budget Activities BA1-BA5
 - 76% in Science and Technology Base
- **Transformational Approaches will be applied – leverage genomics, proteomics and systems biology data explosion**
- **Technical and program advisory leadership from team of nationally recognized experts**
 - BW defense, microbiology, drug development
 - Will draw heavily from commercial and academic performers
- **Basic Research/Science (\$28M)**
 - Directed at common pathways (modes of action) in pathogen host response
 - Find novel intervention points



Broad Spectrum Therapies for Novel Biodefense Threats (Cont'd)



- **Applied Research/Science (\$18M)**
 - Directed at expanding technologies
 - Speed the cycle from discovery to license application
- **Advanced Science/Tech Development (\$30M)**
 - Aimed at quick wins based on new compounds and technology approaches demonstrating current success
 - Strategy to deliver products with IND approval (Phase 1 trials) for BioShield acceptability and further investment
- **Advanced Component Development and System Demonstration (\$24M)**
- **Ultimate goal is defeat of genetically engineered biological threat**



Emerging Threats: Path Forward



- **Anticipate the threat**
- **Deliver New capabilities Short Term and Long Term**
- **Exploit Existing Med CM as Well as Survey Existing Therapeutics**
- **Major Investments Needed in Host-pathogen Infection Process to Identify Common Targets for Broad-spectrum Drugs**
- **Push Developments to Diagnostics, Therapeutics and Pretreatment Portfolios**
- **Needs to Harness all of the Major Bioinformatics and Molecular Biology Breakthroughs**



Conclusion

- **Finish What we Started on Classic Threats**
 - **Legacy Products Need Investment to Take These Threats Away from the Enemy**
- **The Good Old Days are over**
 - **Next Generation Threats Need New Thinking, Bold Approaches and Harnessing Information Revolution in Biology**
- **Best Approach for Long-term Threats is Looking for Common Virulence Pathways**
 - **Defeat Next Generation Threats by Attacking Problem at the Common Host Response Pathways**



Questions?

<http://www.acq.osd.mil/cp>