

# Basic Research for Countering Weapons of Mass Destruction (WMD)

*DTRA sponsors basic research to enable capabilities that counter the global WMD threat*

## **New research efforts are needed:**

### **Science of WMD Sensing and Recognition**

- This research thrust involves exploration and exploitation of interactions between materials and various electromagnetic phenomena, molecules, nuclear radiation or particles
- Research explores fundamental understanding of the measurable changes that occur when a material is stimulated by energy, molecules or particles from WMD in the environment
- Advances capabilities to detect, identify and characterize WMD materials; and promises significant advancements in stand-off capabilities

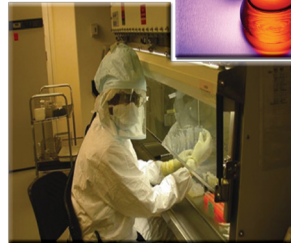
### **Science to Defeat WMD**

- This research thrust seeks new methods and materials to neutralize or destroy WMD systems, and investigates enhanced modeling and simulation of the interaction and response of WMD components and materials to explosive blast and/or neutralizing environment
- Research focuses on orders-of-magnitude improvements in energy density and energy release rate over current capability; and eliminates WMD-material collateral effects
- Advances capabilities to characterize and defeat hidden or hardened structures containing WMD, the complex challenges associated with accessing these targets, and denying the enemy use of WMD



### **Science for Protection**

- This research thrust seeks to advance knowledge for protection of personnel, resources, and infrastructures
- Research involves basic science investigations that reduce consequences of WMD, assist in the restoration of infrastructures, equipment and facilities, and supports assessments
- Advances capabilities to improve complex physical network functions against wide-area WMD effects; shield or harden components or systems (e.g. satellites, electronics) and infrastructure (e.g. communication); understand emerging threats, including better knowledge of potential CBRNE effects and countermeasures to attack

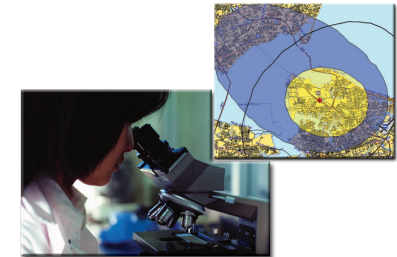


### **Basic Research Strategy**

Basic research is directed towards greater knowledge or understanding of phenomena without regard to specific applications. The DTRA Basic Research Program pursues efforts within and across disciplines such as biological science, chemical science, computer/network science, material science, math-ematics, medical science, nuclear science, physics, and social sciences.

### **Cognitive and Information Science**

- This research thrust explores attributes of complex, often independent physical and social networks, and of WMD-related human motivation and decision factors in the context of these networks
- Research investigates better understanding and prediction of individual and group dynamics associated with acquisition, proliferation, potential use of WMD and of the behavior and vulnerabilities of physical and social networks that underlie these dynamics
- Advances capabilities to understand the factors that influence network robustness, dynamic behavior, concepts of operation, affect adversarial strategic decisions, and significantly enhance WMD situational awareness



### **Science to Secure WMD**

- This research thrust seeks to improve scientific knowledge that supports verification of treaties, safeguards, and non-proliferation
- Research includes revolutionary means to safely handle, transport, secure, or eliminates WMD components and weapons; and novel means that lead to physical or other methods to monitor compliance and reduce illegal proliferation pathways
- Advances capabilities for safe and verifiable control of materials, systems, and facilities that underpin greater confidence for entering, exiting, or sustaining multi-national WMD-related agreements

*DTRA is focused on attracting and training world-class talent and on promoting fundamental research that enables revolutionary advances in countering WMD threat.*

## Mission

The Defense Threat Reduction Agency (DTRA) safeguards the United States and her allies from weapons of mass destruction (chemical, biological, radiological, nuclear, and high yield explosives) by providing capabilities to reduce, eliminate, and counter the threat and mitigate its effects.

## Basic Research Investment

DTRA accomplishes its mission by investing in basic research efforts at universities, national labs and DoD service labs, to enable future capabilities to better counter threats posed by weapons of mass destruction. We also facilitate productive relationships with other scientific organizations and seek to identify promising research efforts overseas. Through the Basic Research Program, DTRA recruits and trains scientists and engineers to develop a talented workforce for the future.

Call for proposals and Broad Agency Announcements can be found at:

[www.grants.gov](http://www.grants.gov)  
[www.fedbizopps.gov](http://www.fedbizopps.gov)

To submit proposals for DTRA Basic Research funds go to:

<http://www.dtrasubmission.net/SignIn.asp>

If you have questions about the DTRA Basic Research Program contact:

[BasicResearch@dtra.mil](mailto:BasicResearch@dtra.mil)

For employment opportunities at DTRA visit

[www.usajobs.gov](http://www.usajobs.gov)

## DTRA's Basic Research Program

DTRA is committed to investing in Basic Research. Our technical experts foster basic research projects that could eventually transition to research results that support our ability to counter the threat of weapons of mass destruction. Using carefully balanced research portfolios, our technical leaders seek to create opportunities for revolutionary scientific breakthroughs that will enable the U.S. to better address future threats.



For information on DTRA, please go to:

[www.dtra.mil](http://www.dtra.mil)



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**DTRA**  
Defense Threat  
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**Basic Research  
for Countering  
Weapons of Mass  
Destruction**