Why Should DOD Invest In Basic Research?

A Presentation for
The American Chemical Society

Dr. William S. Rees, Jr.
Deputy Under Secretary of Defense
(Laboratories and Basic Sciences)
28 Feb 08
Basic Research

- Basic research is systematic study directed toward greater knowledge or understanding of the fundamental aspects of phenomena and of observable facts without specific applications towards processes or products in mind. It includes all scientific study and experimentation directed toward increasing fundamental knowledge and understanding in those fields of the physical, engineering, environmental, and life sciences related to long-term national security needs. It is farsighted high payoff research that provides the basis for technological progress. Basic research may lead to: (a) subsequent applied research and advanced technology developments in Defense-related technologies, and (b) new and improved military functional capabilities in areas such as communications, detection, tracking, surveillance, propulsion, mobility, guidance and control, navigation, energy conversion, materials and structures, and personnel support. Program elements in this category involve pre-Milestone A efforts.

Why Does DoD fund Basic Research?

- DoD is perpetually, permanently in the capability business
- By choice, DoD’s capabilities depend on technology
- Technology is the fruit of science
- Basic Research produces the new, transcendent ideas
- Threats are multiplying, ramifying
- Science is burgeoning outside the US spawning new technologies
- Technologies move rapidly across borders
- If technology exists, it will be used, first in weapons

*We cannot know when a discovery will become a capability but we know with absolute certainty that without discovery, our capabilities remain static.*
Why Does DoD fund Basic Research?

- Generates discoveries, new knowledge, and improved understanding that is the foundation of future, improved military capabilities.
- Achieves technological superiority and obviates technology imbalances favoring adversaries.
- Prevents technological surprise.
- Educates scientists and engineers in physical science disciplines needed for defense applications.
- Ensures that scientific expertise and engineering rigor supports DoD technical decisions. Given the rate of technical progress in some disciplines, e.g., information technology, continuing efforts are needed simply to remain conversant with state-of-the-field.
- Sustains the human talent and research infrastructure needed for continuing performance of cutting-edge defense programs.
Don't expect Basic Research to solve all problems
Conceptual Strategic Planning Process

Joint Operational Capability Gaps

QDR, SPG

Joint S&T Capability Gaps

JWSTP

Map S&T Gaps Against Services’ Basic Research Programs

Department-level Basic Research Investment Guidance

Not all joint operational capability gaps will have S&T capability gaps

Not all joint S&T capability gaps will demand basic research investment

Some Service basic research initiatives address enterprise-wide issues

Extant Service specific Basic Research program

Joint, Basic Research investment gaps

unclassified

classified

Dr William S. Rees, Jr, DUSD(LABS) <<Why DoD should do ..ACS ...ppt>> 28 Feb 2008
Quadrennial Defense Review

Defeat Terrorist Extremism
Counter WMD
Defend Homeland
Shape Choices

“Shifting Our Weight”

Today's Capability Portfolio

Irregular
Traditional
Catastrophic
Disruptive
Desired S&T Investment Areas