

CONTROLLING DANGEROUS **PATHOGENS PROJECT**

- 1) What is dual-use research?**
- 2) What are the challenges associated with defining the most consequential areas of dual-use research?**
- 3) What are the implications for individual scientists and their work?**

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Dual-use research

- **Context**
- **Objective**
- **Subject**

General context

“During our times, technology has become an important social value. The possible destructive development may not be the major risk humanity faces, but rather the fact that the ability to take action is much greater than the ability to foresee and anticipate.”

Umberto Galimberti - *Orme del sacro*, Feltrinelli, Milano, 2000
(emphasis added, non-authorized translation)

Specific context

- Political

- Proliferation: *Khan network; Aun Sect; Iraq*
- Deliberate release: *Anthrax letters, 2001*
- Defense activities: *"Project Jefferson" (US DIA)*

- Non-political

- Laboratory accidents: *Sabiá virus*
- Transfers: *Sabiá virus*
- Accidental release: *Sverdlovsk, 1979; accidental release of agents/materials, including GMO*
- Other concerns: *unexpected results (Jackson, R.J., A.J. Ramsay, C.D. Christensen, S. Beaton, D.F. Hall, and I.A. Ramshaw. 2001. "Expression of mouse interleukin-4 by a recombinant ectromelia virus suppresses cytolytic lymphocyte responses and overcomes genetic resistance to mousepox," Journal of Virology 75:1205-1210)*

What is dual-use research?

- **Complexity: philosophy, politics, ethics, diplomacy, science, culture**
- **Definition/Integration of terms: research, dual use, dangerous pathogens**
- **Related matters/Precedents: International Conventions (BWC, CWC, Biodiversity etc), multilateral arrangements for export control, international organizations (WHO, FAO, OIE), national practices**

What is dual-use research?

- Objective
 - Philosophical/Academic exercise
 - Strengthen an already existing system
 - Raise awareness
- Policy making
 - Prohibition/Control
 - Guidelines, codes of conduct/practice
 - Target: individuals and/or institutions
 - National, regional, international

What is dual-use research?

Philosophical/Academic exercise

Question:

What is the fundamental difference between the involvement of a scientist in a nuclear weapon project and in a biological weapon project ?

What is dual-use research?

- **Subject**

- **Pathogens** (dangerous; human, animal, plants, materials)
- **Technologies** (mathematical modeling, aerobiology, biotechnology, nanotechnology, others)
- **Related materials** (equipment, reagents, raw materials)
- **Information** (public, specialized audience)
- **Locations** (civilian or military, industry, academia)
- **Ideas or intentions**

Definition of terms/concepts

- Research:

"Basic scientific research" means experimental or theoretical work undertaken principally to acquire new knowledge of the fundamental principles of phenomena or observable facts, not primarily directed towards a specific practical aim or objective. (NSG, MTCR, China - Dual-Use Biological Agents and Related Equipment and Technologies Export Control List, 2002)"

Definition of terms/concepts

- **Dual-Use:**
 - Items that have both commercial and military or proliferation applications. While this term is used informally to describe items that are subject to the EAR, purely commercial items are also subject to the EAR (U.S. Export Administration Regulations)
 - Goods and technology developed for civilian uses, but which can be used for military applications or to produce weapons of mass destruction. Dual-use items are not weapons and are traded, sometimes very widely, for perfectly legitimate civilian purposes. (European Commission)
 - "Biological dual-use specialty" means the character of being used either for peaceful purposes, such as medicine, prevention, protection, or for non-peaceful purposes, such as development and production of biological weapons. The pathogens, toxins and genetic elements with such character are called dual-use biological agents; and the equipment with such character is called dual-use biological equipment.
(China - Dual-Use Biological Agents and Related Equipment and Technologies Export Control List - 2002)

Integration of terms

- **Dual-use research**

U.S. Approach:

- NRC/Fink report – Experiments of concern
- National Science Advisory Board on Biosecurity –
Criteria for identifying dual use research and results

Atlas R.M., Dando M.: The Dual-Use Dilemma for the Life

Sciences: Perspectives, Conundrums, and Global Solutions.

Biosecurity and Bioterrorism: Biodefense Strategy, Practice, and

Science. Sep 2006, Vol. 4, No. 3 : 276 -286

What is dual-use research?

Atlas and Dando, September 2006

“dual use dilemma for modern biology and its possible misuse for hostile purposes:

- 1) ostensibly civilian facilities that are in fact intended for military or terrorist bioweapons development and production;
- 2) equipment and agents that could be misappropriated and misused for biological weapons development and production; and
- 3) the generation and dissemination of scientific knowledge that could be misapplied for biological weapons development and production.”

What are the challenges?

- **How to focus on what you really want to achieve:** non-proliferation (State/non-State actors), prevent accidental release, control of transfers, others
- **Allies and foes**
- **Dilemma:** if you restrict the consequential areas you loose scope; if you broad you loose sight
- **How to involve the international community:** too many actors, different in nature and scope

What are the implications?

- For the individual scientist:
 - Newcomers: *few, but...*
 - "In July 2002, a student at the University of Connecticut was arrested and charged under amendments in the Patriot Act to Title 18 of the U.S. Code for retaining two vials of anthrax-infected tissue in a laboratory freezer.
 - In addition, the roughly 9,000 American scientists seeking to work with listed agents must undergo an FBI security-risk-assessment screening against criminal, immigration, terrorism, and other national-security databases.
 - Old guys: change in behavior or retirement...
 - In January 2003, a scientist at Texas Tech University was arrested in for allegedly lying to FBI agents about the disappearance of 30 vials of plague bacteria, which he had brought to the United States from Tanzania.
 - Terrorists (?): some inconveniences, since they have better and less complicated areas for action.

What are the implications?

- For science:
 - "*E pur si muove*" or "*Eppur si muove*" (Galileo), meaning "*And yet it moves*"
 - "A letter from 758 infectious disease researchers created uproar last month. It complained that the \$1.8 billion being spent on biosecurity in NIH each year is unnecessary and diverts funds from higher priority research." (FAS Report -Winter 2005 Volume 58, Number 1)
 - Some academic laboratories destroyed rare archival stocks of human, plant, or animal pathogens. Iowa State University discarded its entire collection of anthrax specimens after the Ames strain was linked to the 2001 anthrax letter attacks, and scientists at several other institutions, including the University of Pennsylvania, Duke, and Harvard University, have also destroyed stocks of select agents that were not in active use.