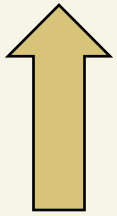
Integrity in science with dual-use potential

Lida Anestidou, DVM, PhD
Institute for Laboratory Animal Research
National Academy of Sciences, USA

What is research with dual-use potential

Public health / pharmaceuticals / agriculture



- Materials: seed cultures of pathogens, toxins, etc
- Equipment: fermenters, centrifuges, freeze dryers, etc
- Technology and knowledge: 'know-how', expertise

Biological weapons / Bioterrorism

Slide reprinted with permission from panelist Robert Mathews

Experiments of concern

A. The Fink Report (NRC 2004)

- Render a vaccine ineffective
- Confer resistance to antibiotics and antivirals
- Enhance virulence of pathogens or vice-versa
- Increase pathogen transmisibility
- Alter the host range of a pathogen
- Protect pathogens from detection
- Enable weaponization of biological agents or toxins

B. Ethics Review at the European Commission (2010)

- Research w/information and communication technologies: surveillance, data mining, and profiling
- Research that leads to stigmatization or discrimination

The dual-use dilemma

How to prevent the misuse of biological and biotechnology research for hostile purposes without hindering their peaceful application

- Dual-use nature of materials and equipment
- Difficulty in recognizing hostile intent in innocent transactions
- Research for beneficial purposes can have hostile applications

Slide reprinted with permission from panelist Robert Mathews

Is the scientific practice changing?

- Should we not engage in research for fear of its outcome? Is there forbidden knowledge? Are there things we should not know? (Kemper et al. *Science* 2005)
- Should we control and restrict research results from publication, dissemination, sharing and open collaboration?
- PNAS 2010 (Dias et al.)
  - steep decline in the number of papers published and 2-5x increase in the cost of select agents research
  - collaboration much more difficult
- AAAS/NAS survey 2009

Scientists support oversight through self-governance and responsible conduct of research

Panelists

- Gerald Epstein, American Association for the Advancement of Science, USA
- David Franz, Office of the Secretary of Defense, USA
- Daniel Davis, National Institutes of Health, USA
- Robert Mathews, University of Melbourne, Australia
- Elizabeth Heitman, Vanderbilt University, USA

Chairs

- Paula Strickland, National Institutes of Health, USA
- Lida Anestidou, National Academy of Sciences, USA