

DRAFT 10-21-11

**WORKSHOP**

**The Intersection of Science and Security:  
a Case Study Approach**

*Continuing the global dialogue with the scientific and science policy  
community with a focus on Asia and the Western Pacific*

**Sponsored by United States government and hosted by the  
National Science Advisory Board for Biosecurity**

**National Institutes of Health**

December 9, 2011

1:00 pm-4:30 pm

Masur Auditorium

NIH Campus, Building 10

9000 Rockville Pike

Bethesda, Maryland

**1:00 pm      Welcome and opening remarks**

*Dr. Amy Patterson  
Associate Director for Science Policy  
National Institutes of Health, Bethesda, MD*

*Dr. Za Hussein Reed  
Assistant Director for Clinical Research  
Regional Emerging Diseases Intervention (REDI) Center, Singapore*

*Dr. Dave Franz  
NSABB Member  
Vice President and Chief Biological Scientist  
Midwest Research Institute, Frederick, MD  
Director, National Agricultural Biosecurity Center, Kansas State University*

**1:20 pm**

**Panel I –Discussion of science and security issues utilizing an article on Mousepox as a case study**

Background:

Scientific research is a vital social undertaking that yields innumerable and immeasurably important benefits. At the same time, good science can be put to bad uses, and even a single misuse of certain information, knowledge, or technology could have far reaching and devastating effects. Over the past ten years, there has been a

growing recognition that some information, knowledge, or technologies resulting from scientific research, in the wrong hands, can be misused to pose a threat to public health and national security. Research yielding new technologies or information with the potential for both benevolent and malevolent applications is referred to as "dual use research" (DUR) and a subset of the most problematic research is termed "dual use research of concern" (DURC). An example of this latter kind of research is reported in a February 2001 publication where researchers inadvertently developed a lethal mousepox virus. Through genetic engineering the researchers in Australia inserted a gene into the mousepox virus hoping to ultimately induce infertility in mice by using the product as a pest control agent for the overpopulation of mice in Australia. The results of the experiment were that the altered virus was capable of killing both naturally resistant mice, and those that had been vaccinated against ordinary mousepox. After publication and widespread publicity, many were concerned that the article was not only alerting potential terrorists to a possible novel biological orthopox virus weapon (such as modified smallpox), but also providing them with detailed instructions on how to construct it. The purpose of this session is to have the mousepox research and article presented by the principal investigator in order to stimulate a discussion about the science and security issues it raises, including the rationale for the research and the issues surrounding the publication of the results, including the public health, ethical and security concerns and implications for scientists everywhere.

Moderators:

*Dr. Herawati Sudoyo*

*Deputy Director*

*Eijkman Institute for Molecular Biology, Jakarta, Indonesia President, Indonesian Biorisk Association, Jakarta, Indonesia*

*Dr. Jeffery Miller*

*NSABB Member*

*Professor and Chair, Department of Microbiology, Immunology & Molecular Genetics, David Geffen School of Medicine  
University of California - Los Angeles, Los Angeles, CA*

Discussion Questions:

- What might the researchers and others (journal editor and government authorities) have done differently to address the security issues inherent in the research at the time the research was conducted? What would happen today?
- What role should the Institutional Biosafety Committee/reviewing body have in evaluating research with potential biosafety and biosecurity concerns?
  - What systems have been established, in countries in the region to regulate biosafety and biosecurity issues? How is potential for Dual Use in research evaluated?
- What lessons can be learned from this case study?

Presenter:

- *Dr. Ian Ramshaw*

*Director, National Centre for Biosecurity*

*The John Curtin School of Medical Research, Australian National University*

Canberra, Australia

Panelists

- *Dr. Robert Floyd*  
*Director General*  
*Australian Safeguards and Non-proliferation Office, Canberra, Australia*
- *Dr. Michael J. Selgelid*  
*Senior Lecturer and Deputy Director, Centre for Human Bioethics*  
*Monash University, Clayton, Australia*
- *Dr. Chan-Wha Kim*  
*President, Asia-Pacific Biosafety Association*  
*Professor, College of Life Sciences and Biotechnology,*  
*Korea University*  
*Seoul, South Korea*
- *Dr. H. V. Murugkar*  
*Senior Scientist (VPH) cum Biosafety Officer*  
*High Security Animal Disease Laboratory*  
*Indian Veterinary Research Institute*  
*Bhopal, India*
- *Dr. Zhiming Yuan*  
*Professor, Deputy Director*  
*Wuhan Institute of Virology, Chinese Academy of Sciences*  
*Wuhan, China*

1:30 pm

Panel discussion and questions from the audience

2:05 pm

**Panel II - Discussion of science and security issues utilizing an article on a SARS-like virus as a case study**

Background:

The recognition of potential dual use research has increased over the last decade and some institutions are working directly with their scientists to assess and manage potential dual use research of concern. One example is where two U.S. scientists were conducting research to synthetically generate a non-cultivable bat virus genetically related to a severe acute respiratory syndrome coronavirus (Bat-SARS-like CoV). The overall goals of the research were to establish strategies for recovery, testing, and attenuation of the potential pandemic non-cultivable viruses, and to determine pathways of Bat-CoV host-species movement and adaptation. The research was considered highly significant since it could enable more timely response to potential species jumps and more rapid and effective public health intervention. The investigators determined that the proposed research would constitute dual use research of concern

as it fell within two of seven NSABB categories to consider for potential DURC The researchers therefore established a consultative working group consisting of the biosafety committees from both investigator institutions as well as experts from the “Policy, Ethics and Law” core from a NIH-sponsored Regional Center of Excellence. Criteria were established and intermittently reviewed for experimental design, commercial gene synthesis, material transfer, biosafety, biosecurity, termination of research, publication, and public response and media communication. The investigators also maintained communication with public health and grant program officials throughout design and performance of experiments. The purpose of this session, following the presentation by the senior author, is to discuss the case of a synthetic Bat SARS-like coronavirus and how it relates to science and security, particularly addressing the biosafety and biosecurity oversight of the research, in addition to ethical and publishing considerations.

Moderators:

*Dr. Michael J. Selgelid  
Monash University, Clayton, Australia*

*Dr. Dave Franz  
NSABB Member  
Midwest Research Institute, Frederick, MD*

Discussion questions:

- What role should an Institutional Biosafety Committee/reviewing body/ consultative group have in evaluating research with potential biosafety and biosecurity concerns?
  - How prepared are institutional biosafety committees to make determinations of dual use research of concern and to provide guidance for research design and evaluation?
  - What systems have been established in countries in the region to regulate biosafety and biosecurity issues? How is the potential for dual use in research evaluated?
  - Should plans be discussed in regards to unexpected outcomes from the research? When?
- What is the best way to approach journals about a publication based on research of potential dual use research of concern?
- What lessons can be learned from this case study?

Presenter:

- *Dr. Mark Denison  
Craig-Weaver Professor of Pediatrics  
Departments of Pediatrics and Microbiology and Immunology  
Vanderbilt University  
Nashville, TN*

### Panelists

- *Dr. Murray Cohen*  
*NSABB Member*  
*President and Chairman, Frontline Healthcare Workers®*  
*Safety Foundation, Ltd.*  
*Atlanta, GA*
- *Dr. Anwar Nasim*  
*Chairman*  
*Interagency Taskforce on Biosafety and Biosecurity, Islamabad, Pakistan*
- *Dr. Za Hussein Reed*  
*Regional Emerging Diseases Intervention Center, Singapore*
- *Dr. Herawati Sudoyo*  
*Deputy Director*  
*Eijkman Institute for Molecular Biology, Jakarta, Indonesia*  
*President, Indonesian Biorisk Association*
- *Dr. Jeffery Miller*  
*NSABB Member*  
*University of California - Los Angeles, Los Angeles, CA*
- *Dr. Masayuki Saijo*  
*Director, Department of Virology 1*  
*National Institute of Infectious Diseases, Tokyo, Japan*

**2:15 pm**      **Panel discussion and questions from the audience**

**2:50 pm**      **Break**

**3:05 pm**      **Panel III - General discussion of science and security globally with an emphasis on Asia and the Western Pacific**

### Background:

As concerns about terrorist activities and threats have become a global issue, the need for international communication and collaboration have become more apparent. Undertaking a biological attack using naturally occurring or genetically manipulated pathogens in many cases remains relatively easy, inexpensive, and the necessary information and materials often are widely available. The scientific community needs to engage on biosecurity as well as biosafety concerns.

Traditionally, biosafety committees within an institution or organization are responsible for managing biosafety issues and training, but a means of dealing with biosecurity at the local level does not appear to be broadly recognized or have a widely accepted structure. The purpose of this panel discussion is to identify the status of current

science and security requirements and best practices and educational/training resources globally, including on the Internet, and to identify additional tools that need to be developed. There will be a special focus on resources available in Asia and the Western Pacific and any gaps that need to be filled.

Moderators:

*Dr. Stuart Levy*

*NSABB Member*

*Director, Center for Adaptation Genetics and Drug Resistance*

*Professor of Molecular Biology/Microbiology and Medicine*

*Tufts University School of Medicine, Boston, MA*

*Dr. Robert Floyd*

*Australian Safeguards and Non-proliferation Office, Canberra, Australia*

Discussion questions:

- What should/could be done going forward to address security concerns in science? By government officials, scientists, journals, etc.?
- How can we ensure critical information is exchanged between the scientific and security communities to help inform determinations of dual use research of concern and questions surrounding publication?
- What are the best ways to engage the scientific and security community to manage the security risks of DURC?
- What current science and security educational/training resources are available globally, and in Asia and the Western Pacific region, including on the Internet?
  - What resources are needed to address the gaps which are not currently addressed globally and in this region?
- What are the best platforms to address security issues, i.e. educational modules, specialized training, etc., formation of specialized committees ?
  - Should this be done through extant bioethics or biosafety training? Or should new courses and other resources under a specific biosecurity umbrella be established?
- How should the trusted insider/insider threat be dealt with? How can those with access to the resources that would use them for malevolent purposes be managed?
- How can a culture of responsibility be established? How can personnel reliability best be assured?
- What regulations or strategies exist for managing research involving synthetic biology in countries in this region?

Panelists:

- *Dr. Murray Cohen*  
*NSABB Member*  
*Frontline Health Care Workers*  
*Safety Foundation, Ltd., Atlanta, GA*
- *Dr. Mark Denison*

*Vanderbilt University, Nashville, TN*

- *Dr. Dave Franz  
NSABB Member  
Midwest Research Institute, Frederick, MD*
- *Dr. Chan-Wha Kim  
President, Asia-Pacific Biosafety Association  
Korea University, Seoul, South Korea*
- *Dr. Jeffery Miller  
NSABB Member  
University of California - Los Angeles, Los Angeles, CA*
- *Dr. H. V. Murugkar  
Indian Veterinary Research Institute, Bhopal, India*
- *Dr. Anwar Nasim  
Interagency Taskforce on Biosafety and Biosecurity, Islamabad, Pakistan*
- *Dr. Amy Patterson  
National Institutes of Health, Bethesda, MD*
- *Dr. Ian Ramshaw  
Australian National University, Canberra, Australia*
- *Dr. Za Hussein Reed  
Regional Emerging Diseases Intervention Center, Singapore*
- *Dr. Masayuki Saijo  
National Institute of Infectious Diseases, Tokyo, Japan*
- *Dr. Michael J. Selgelid  
Monash University, Clayton, Australia*
- *Dr. Herawati Sudoyo  
Eijkman Institute for Molecular Biology, Jakarta, Indonesia President, Indonesian  
Biorisk Association, Jakarta, Indonesia*
- *Dr. Zhiming Yuan  
Wuhan Institute of Virology, Chinese Academy of Sciences*

**3:20 pm**      **Panel discussion and questions from the audience**

**4:15 pm**      **Concluding remarks**

*Dr. Amy Patterson  
National Institutes of Health, Bethesda, MD*

*Dr. Za Hussein Reed  
Regional Emerging Diseases Intervention Center, Singapore*

*Dr. Dave Franz  
NSABB member  
Midwest Research Institute, Frederick, MD*

**4:30 pm      Meeting adjournment**