# EXECUTIVE SUMMARY

## Dual Use Issues in Life Sciences Research: A Roundtable on Strategies for Fostering International Engagement

### October 10, 2007, NIH, Bethesda, Maryland

The United States (US) government sponsored an International Roundtable on Dual Use Life Sciences Research: "A Roundtable on Strategies for Fostering International Engagement." This second NSABB International Roundtable was convened for one day, hosted by the International Working Group of the National Science Advisory Board for Biosecurity (NSABB).

The first International Roundtable, co-sponsored by the US Government and the World Health Organization (WHO), was held in February 2007. That meeting brought together scientific experts and policymakers from 17 countries to begin discussing the issues surrounding dual use research, particularly dual use research of concern (DURC). Discussions focused on a range of perspectives and concerns about dual use life sciences research and current or planned activities that address those issues. Participants were invited as experts and did not necessarily represent their governments or organizations. There was general agreement among the participants on a number of principles that served as a backdrop to this Roundtable. Discussion centered on various approaches for addressing dual use research issues and identified some options for next steps, including exploring the needs of individual countries, developing strategies for engaging the various stakeholders, considering the development of an international communications network for dual use research issues and activities, and identifying strategies for ongoing and expanded international dialogues on dual use research issues.

Following that Roundtable, we became aware of the value of exploring the activities of organizations already engaged in dual use research issues before moving directly to developing proposed strategies to implement specific recommendations. This second International Roundtable was organized so that representatives of the involved organizations could be asked what they have been doing, what their experiences have been and what they think needs to be done to further international engagement. The overall goal of this roundtable was to obtain a comprehensive international "status report" and to advance the dialogue already begun, to review and synthesize efforts already underway, and to identify options for actions.

The twelve invited presenters at the 2nd Roundtable were drawn from the major international and U.S. organizations that had already taken an interest in the dual use life sciences research issues and had already taken steps to address them. Additionally, both past and present funders of dual use-related activities were invited to present on their current and previous support of those efforts. An additional 12 discussants were invited from international and domestic organizations with an international component or strong international interest and that had already been involved with dual use research issues in a substantial way. As opposed to the first Roundtable, the presenters and discussants were expected to represent the official views of their organizations.

There were five sessions. The first four were panels (science academies, scientific unions, intergovernmental organizations, and foundations) composed of individual presenters from organizations in those categories. Each presenter was asked to describe the scope of and goals for current activities, mechanisms used to carry out those

activities, partners in those activities, challenges, metrics of success, lessons learned and advice they would give to others planning these types of activities, their perception of unmet needs in this area and future plans. The final session was an open discussion for all participants informed by the panel presentations and the discussions following each panel to offer shared insights and perspectives on strategies to enhance scientific progress while minimizing the potential for misuse of research methodologies and information, with specific activities to raise awareness and understanding and to foster further communication and collaboration.

Introductory comments by Drs Patterson, Franz and Levy framed the discussion for the day. Dr. Patterson explained that "dual use research of concern" (DURC) had been defined by the NSABB in the "Proposed Framework for the Oversight of Dual Use Life Sciences Research: Strategies for Minimizing the Potential Misuse of Research Information" (NSABB Report, June 2007) as "research that, based on current understanding, can be reasonably anticipated to provide knowledge, products, or technologies that could be directly misapplied by others to pose a threat to public health and safety, agricultural crops and other plants, animals, the environment, or materiel." There is now a consensus within the NSABB that essentially all research might in some way be considered 'dual use'; the board has chosen to focus on that subset more likely to be misapplied, thus the designation DURC. The probability of misuse is unknown but even if small, the potential consequences for public health, safety, security, and public trust are significant. While DURC is of global concern, the priority that any given nation places on dual-use research issues will depend in large part on the other issues that nation faces. The focus of the Roundtable should be on DURC rather than a much broader category.

The presentations by representatives of academies, scientific unions, and intergovernmental organizations revealed a considerable interest and activity in the dual use research area. Academies and unions have concentrated on responsible stewardship of science, and have held meetings and established programs devoted to dual use research-related issues. The focus has been on awareness and development of principles that can be used by national member organizations to formulate their own codes, materials and policies. A number of future meetings and publications geared to move the dual use research agenda forward were identified.

The presentations by the intergovernmental organizations revealed much relevant activity and substantial plans to reach countries through regional meetings, to heighten awareness, increase communication and to develop guidelines, and other components of potential "tool-kits." The presentations by the funders revealed very specific and focused activities, many by organizations participating in the Roundtable. It was suggested that new ideas for further engagement on dual use issues would be welcome and funding for these could be made available by at least some funders. The final session was a free-flowing discussion of key dual-use issues that built upon the earlier presentations and discussion periods following each panel. There was no attempt to reach a consensus on any topic. Some issues were explored in detail, others only touched on by one or two participants, and still others raised in the panel presentations were not dealt with at all.

The following are some of the major points made in the final session and include comments from the brief discussion periods that followed the earlier panel presentations:

## UNDERLYING CONCEPTS AND CHALLENGES IN DEVELOPING A DUAL USE RESEARCH INTERNATIONAL ENGAGEMENT STRATEGY

Science is a social contract between scientists and society. Science is a critical component of public health and well being, and therefore a precious resource that needs to be protected against misuse.
The challenge of DURC is a complex issue with many pieces and many stakeholders. Because of this, no single organization can take the lead. Lack of awareness of the importance of the dual use issue is widespread. Dual use research issues exist at the intersection of science and security as well as between the public and private sectors. The life-sciences community has little experience with security issues and has a reluctance to engage. There is no single "international scientific community." Instead there is a wide array of organizations with

disparate memberships and mandates and a wide array of policy positions. Additionally, there is a diffuse set of intergovernmental organizations and treaty regimes with variable scientific input and security awareness. Industry and other components of the private sector and funding organizations have an important role to play in the dual use research arena and should be more actively engaged.

The issue of funding will be very important in the future because meetings, activities, publications, and other methods of communicating, collaborating and disseminating information about dual use issues will require substantial funds.

Dual use issues are considered by some countries as relatively esoteric because they view issues such as health, poverty, and clean water as more pressing concerns.

## DEFINITIONAL PROBLEMS CONFOUND THE USE OF TERMS SUCH AS DUAL USE RESEARCH, BIOSAFETY, AND BIOSECURITY IN INTERNATIONAL AND NATIONAL SETTINGS

Not only is there a lack of understanding as to what "dual use research" means, but the terms "biosafety" and "biosecurity" mean different things to different people and organizations. Standardized definitions are needed for these terms as well as for "risk assessment" and "risk management." The definitions need to be meaningful in multiple languages and scientific cultures. Terminology and the nuance of language and definitions are key to garnering international support for actions to address dual use issues. Regardless, the term "dual use" is an obstacle to dialogue in many parts of the world. Some believe that the term "dual use" cannot be used successfully internationally, at the present time, because of a perceived political agenda.

## PROMOTING AWARENESS OF DUAL USE RESEARCH ISSUES

Raising awareness of dual use research issues among the public and in the scientific community is a key early step in shaping international cooperation and collaboration.

There are caveats, however, in raising awareness. Public awareness of dual use concerns must be raised without inciting alarm. Merely raising awareness about dual use research issues could result in fear among the public. Scientists could be worried that their research will be disapproved and/or they will be unable to publish. Thus, education and training must accompany awareness efforts.

The "messengers" i.e., who will be delivering the DURC messages, are important. International and national scientific organizations will be likely the best groups to convey information to scientists. Opportunities for that kind of engagement abound through professional societies.

## PROMOTING EDUCATION AND TRAINING IN DUAL USE RESEARCH ISSUES

Education and training should be global and multidisciplinary**.** To be effective, dual use activities in education/training/oversight must be international in scope. Regional as well as international scientific and security organizations need to be engaged in dual use research issues. Training needs to include veterinary issues and agricultural pathogens because similar risks are involved. Training modules that can be widely used are needed.

## PROMOTING COMMUNICATION AMONG DUAL USE RESEARCH INTERESTED PARTIES

Communication among stakeholders interested in dual use issues must be promoted.
Without a broadly and easily available and free means of communication, initiating and sustaining cooperation, coordination, and collaboration among relevant parties will be very difficult.

Networks and networks of networks are needed. Networks will facilitate cooperation and collaboration. A web portal that could serve as an important source of information and input is currently under consideration by several organizations including OECD and the Federation of American Scientists.

## APPROACHES TO COORDINATION AND COLLABORATION

Conferences and meetings that bring together international groups that influence international and national policies are good mechanisms for developing coordination and collaboration. Academies and Unions have a variety of upcoming congresses, workshops, and other meetings with their national and regional representatives that offer excellent opportunities for dual use research-related discussions and policy development. A near term opportunity for engagement on dual use issues will be the intersessional meeting for the Biological and Toxins Weapons Convention in 2008; one of the topics on the agenda is consideration of a broad definition of research oversight, education, and awareness-raising. This will give scientific groups some focus and a way to engage their own governments in dual use-related discussions. The intersessional meeting was successful in 2005 and it has potential for wider participation and discussion in 2008. There is a need to create new international, regional and national fora that include scientists and policymakers in order to harmonize discussion and approaches for dealing with dual use research of concern.

National governments should move forward quickly. Intergovernmental organizations will act in a vigorous and decisive manner when member states band together to develop resolutions to be adopted by their governing bodies. This is usually a lengthy process so the sooner draft resolutions are crafted by like-minded governments and brought to the governing bodies, the better. Regardless, current projects managed by intergovernmental organizations are very important as potential vehicles for engagement. Highlighting dual use issue ties to projects and related programs, such as biosafety and biosecurity, implementation of WHO's International Health Regulations and UN activities should be pursued and dual use-related activities/concepts incorporated into such extant programs.

## THE NEED FOR INTERNATIONAL GUIDANCE, GUIDELINES AND STANADARDS

Guidelines are important tangible products. There is a need to develop appropriate risk assessment and risk management methodologies as part of an internationally relevant DURC "tool-kit." NSABB work products/tools might be able to be utilized internationally with some modification or as a stimulus to national framework discussions/actions. They are now available on the NSABB web site and have been submitted to the US Government. They are still under review and thus do not now necessarily reflect official US Government policy. (These documents are the: "Proposed Framework for the Oversight of Dual Use Life Sciences Research: Strategies for Minimizing the Potential Misuse of Research Information" and "Addressing Biosecurity Concerns Related to the Synthesis of Select Agents.")

## METRICS

There is a need to catalogue existing dual use research-related national programs and to understand how to measure success. It will be difficult to measure the value of awareness activities, codes of conduct, and international relationship-building; however, there is a need to determine success—but success will be difficult to measure. What can be measured is which communities and constituencies have been reached, and whether they are considering dual use issues themselves.

The issue of metrics in implementing DURC codes or policies is important in two ways: (1) measuring the level of awareness among the scientific community and the public and (2) measuring the extent to which harm is not done to the scientific enterprise.

## CONCLUSION

The Roundtable was successful in producing valuable information and insights as well as suggestions for the future. The deliberations of this Roundtable (and of the first Roundtable) will be used to provide an important conceptual backdrop for a report from the NSABB to the U.S. Government regarding proposed strategies to foster international engagement on the issues of DURC.

## ATTACHMENTS

**A: Annotated Agenda**

**B: List of Participants**

**C: List of Acronyms**

**D: List of Future International Meetings with DUR Relevance**

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## Attachment A

**AGENDA**
**Dual Use Issues in Life Sciences Research:**
**A Roundtable on Strategies for Fostering International Engagement**
**October 10, 2007**

NIH Campus
9000 Rockville Pike, Bethesda, M.D.
Building 31, C Wing, 6th Floor, Conference Room 10

8:00 A.M. **Welcome and Opening Remarks**

***David R. Franz, D.V.M., Ph.D.***
Chair, NSABB Working Group
Vice President and Chief Biological Scientist
Midwest Research Institute
Frederick, MD

***Stuart Levy, M.D.***
Vice-Chair, NSABB Working Group
Director
Center for Adaptation Genetics & Drug Resistance
Professor of Molecular Biology, Microbiology
and Medicine
Tufts University School of Medicine
New England Medical Center
Boston, MA

8:10 A.M. **Overview and Goals of Roundtable**

***Amy P. Patterson, M.D.***
Executive Director, NSABB
Director
Office of Biotechnology Activities
Office of Science Policy
Office of the Director
National Institutes of Health

**Topics to be Addressed by Panelists:**

- *Scope of and goals for current activities*
- *Mechanisms used to carry out those activities*
- *Partners in those activities*
- *Challenges*
- *How the success of those activities are measured and evaluated*
- *Lessons learned and advice you would give to others planning activities*

- *The unmet needs in this area*
- *Future plans*

8:20 A.M. **Session I: Science Academies and Inter-Academy Organizations**

*This session will provide the opportunity for representatives of national science academies and members of inter-academy organizations to describe their current and future activities that relate to dual use research and to address the questions and issues posed to the Panelists. The Discussion will offer the opportunity to explore issues raised by the presenters and to offer additional comments.*

**MODERATORS:**

***Harvey Rubin, M.D., Ph.D.***
NSABB Working Group Member
Director, Institute for Strategic Threat Analysis and Response
Professor of Medicine, Microbiology, and Computer Science
University of Pennsylvania
School of Medicine
Philadelphia, PA

***Anne K. Vidaver, Ph.D***
NSABB Working Group Member
Professor and Head
Department of Plant Pathology
University of Nebraska, Lincoln
Lincoln, NE

**PANELISTS:**

8:30 A.M. ***Jo Husbands, Ph.D.***
Senior Project Director
Policy and Global Affairs Division
National Academy of Sciences
Washington, DC

8:45 A.M**.** ***Alastair Hay, Ph.D.*** *(By Videoteleconference)*
U.K. Royal Society
Professor of Environmental Toxicology
School of Medicine
University of Leeds
Leeds, United Kingdom

9:00 A.M. ***Li Huang, Ph.D***.
InterAcademy Panel (IAP)/Biosecurity Working Group
Director, State Key Laboratory
of Microbial Resources
China Academy of Sciences
Beijing
People's Republic of China

9:15 A.M. **DISCUSSION:** Panelists, Discussants, Working Group members

10:00 A.M. Break

10:15 A.M. **Session II: International Science Unions**

*This session will provide the opportunity for representatives of international science unions to describe their current and future activities that relate to dual use research and address the questions and issues posed to the Panelists. The presentations will describe how their activities relate to those of their national/regional members and form a part of the network of the International Council for Science. The Discussion will offer the opportunity to explore issues raised by the presenters and to offer additional comments.*

**MODERATORS:**

***Stuart Levy, M.D.***
Vice-Chair, NSABB Working Group
Director
Center for Adaptation Genetics & Drug Resistance
Professor of Molecular Biology, Microbiology
and Medicine
Tufts University School of Medicine
New England Medical Center
Boston, MA

***Anne K. Vidaver, Ph.D.***
NSABB Working Group Member
Professor and Head
Department of Plant Pathology
University of Nebraska, Lincoln
Lincoln, NE

**PANELISTS:**

10:25 A.M. ***Daniel Sordelli, Ph.D.***
President-Elect
International Union of Microbiological Societies
Full Professor, Department of Microbiology
School of Medicine
University of Buenos Aires
Buenos Aires, Argentina

10:40 A.M. ***Bettie Sue Masters, Ph.D., D.Sc., M.D. (Hon.)***
International Union of Biochemistry and Molecular Biology
The Robert A. Welch Distinguished
Professor in Chemistry
The University of Texas Health Science Center at San Antonio
San Antonio, TX

10:55 A.M. ***John Malin, Ph.D.***
Chair, CHEMRAWN Committee
International Union of Pure and Applied Chemistry
American Chemical Society (Retired)
Washington, DC

11:10 A.M. **DISCUSSION:** Panelists, Discussants, Working Group members

11:15 A.M. **Session III: Intergovernmental Organizations**

*This session will provide the opportunity for representatives of intergovernmental organizations and one national representative to intergovernmental organizations/agreements to describe current and future activities of the organizations that relate to dual use research and address the questions and issues posed to the Panelists. Presentations will focus on the activities of the organizations and their relationship to their Member States. The Discussion will offer the opportunity to explore issues raised by the presenters and to offer additional comments.*

**MODERATORS***:*

***David R. Franz, D.V.M., Ph.D.***
Chair, NSABB Working Group
Vice President and Chief Biological Scientist
Midwest Research Institute
Frederick, MD

***Murray L. Cohen, Ph.D., M.P.H., C.I.H***.
NSABB Working Group
President and Chairman
Frontline Healthcare Workers® Safety
Foundation, Ltd.
Atlanta, GA

**PANELISTS:**

11:20 A.M. ***Ottorino Cosivi, D.V.M., M.Sci.***
Project Leader, Program for Deliberate Epidemics
World Health Organization
Geneva, Switzerland

11:35 A.M. ***Michael Oborne, Ph.D.***
Director, OECD Global Science Forum
Organization for Economic Co-operation
and Development
Paris, France

11:50 A.M. ***Robert Mikulak, Ph.D.***
Director, Office of Chemical and
Biological Weapons Threat Reduction
Bureau of International Security
and Nonproliferation
U.S. Department of State
Washington, DC

12:05 P.M. **DISCUSSION:** Panelists, all Discussants, Working Group members

12:30 P.M. **LUNCH**

1:30 P.M. **Session IV: Foundations**

*This session will provide the opportunity for representatives of three foundations to describe their current and planned activities that relate to dual use research and address the questions and issues posed to the Panelists. Presentations will focus on program. priorities and philosophy, approaches to decision-making, especially as they relate to gap-filling projects, and the range and type of target grant awardees. The Discussion session will offer the opportunity to clarify issues raised and offer additional comments.*

**MODERATORS**:

***David R. Franz, D.V.M., Ph.D.***
Chair, NSABB Working Group
Vice President and Chief Biological Scientist
Midwest Research Institute
Frederick, MD

***Barry J. Erlick, Ph.D.***
NSABB Working Group
President
BJE Associates, Inc.
Alexandria, VA

**PANELISTS:**

1:35 P.M. ***Paula Olsiewski, Ph.D***.
Director, Bioterrorism Program
Alfred P. Sloan Foundation
New York, NY

1:50 P.M. ***Ms. Patricia M. Nicholas***
Program. Associate, International Program.
Carnegie Corporation of New York
New York, NY

2:05 P.M. ***Mr. Terence Taylor***
Director
Global Health & Security Initiative
The Nuclear Threat Initiative (NTI)
And
President and Director, International Council for Life Sciences
Washington, DC

2:20 P.M. **DISCUSSION:** Panelists, all Discussants, Working Group Members

2:30 P.M. **Session V: Roundtable Discussion — Opportunities to Foster International Engagement**

*This key session will provide the opportunity for all Roundtable participants to review and synthesize the information presented and discussed during the first four Panels as well as identify potential options for actions in various sectors that might foster − in the most effective way possible − further constructive international engagement on dual use research issues. This will assist the NSABB International Working Group to develop its Report for consideration by the full NSABB.*

**MODERATORS:**

*David R. Franz, D.V.M., Ph.D.*
*Stuart B. Levy, M.D.*
*Amy P. Patterson, M.D.*

***Discussion:*** **All Roundtable participants**

- *Activities now underway based on panel presentations and discussions*
- *Future plans of science academies, scientific unions, intergovernmental organizations, and foundations*
- *Unmet needs or gaps*
- *Lessons learned and challenges for various sectors and parties*
- *How raise awareness about Dual Use Research of concern?*
  - *Which are the target audiences that need to be reached?*
  - *What are the best fora and mechanisms? Presentations at Scientific meetings—on program./at satellite sessions, presentations at workshops on biosecurity/biosafety, others?*
  - *What are the best approaches for education and training?*
- *Which relevant organizations are not at this Roundtable? Roles? Role of industry?*
- *How should interested parties communicate? Networks? Internet, portals, web sites?*
- *How should cooperation, coordination, and collaboration be initiated and sustained among relevant parties?*
- *How should the NSABB work products-tools (**now available on the NSABB web site**) be utilized internationally? The following NSABB Reports have been submitted to the US Government and are not official US Government policy. Are they applicable internationally now? How might they or parts of them be used?*
  - *"Proposed Framework for the Oversight of Dual Use Life Sciences Research: Strategies for Minimizing the Potential Misuse of Research Information"*
  - *"Addressing Biosecurity Concerns Related to the Synthesis of Select Agents"*

3:30 P.M. Break

3:45 P.M. **Session V Discussion Continued**

5:15 P.M. **Next Steps**

*David R. Franz, D.V.M., Ph.D.*
*Stuart B. Levy, M.D*
*Amy P. Patterson, M.D.*

5:30 P.M. **Adjourn**

## Attachment B: List of Participants

***Presenters***

**Ottorino Cosivi, D.V.M.**
Project Leader
Program for Deliberate Epidemics
World Health Organization
Geneva, Switzerland

**Alastair Hay, Ph.D.**
UK Royal Society
Professor of Environmental Toxicology
School of Medicine
University of Leeds
Leeds, United Kingdom

**Li Huang, Ph.D.**
InterAcademy Panel/Biosecurity Working Group
Director, State Key Laboratory of Microbial Resources
China Academy of Sciences
Beijing, People's Republic of China

**Jo Husbands, Ph.D.**
Senior Project Director
Policy and Global Affairs Division
National Academy of Sciences
Washington, DC

**John Malin, Ph.D.**
Chair, ChemRAWN Committee
International Union of Pure and Applied Chemistry
American Chemical Society (Retired)
Washington, DC

**Bettie Sue Masters, Ph.D., D.Sc.**
International Union of Biochemistry and Molecular Biology
The Robert A. Welch Distinguished Professor in Chemistry
The University of Texas Health Science Center at San Antonio
San Antonio, TX

**Robert Mikulak, Ph.D.**
Director, Office of Chemical and Biological Weapons Threat Reduction
Bureau of International Security and Nonproliferation
U.S. Department of State
Washington, DC

**Ms. Patricia M. Nicholas**
Program Associate, International Program
Carnegie Corporation of New York
New York, NY

**Michael Oborne, Ph.D.**
Director
OECD Global Science Forum
Organization for Economic Co-operation and Development
Paris, France

**Paula Olsiewski, Ph.D.**
Director, Bioterrorism Program
Alfred P. Sloan Foundation
New York, NY

**Daniel Sordelli, Ph.D.**
President-Elect
International Union of Microbiological Societies
Full Professor, Department of Microbiology
School of Medicine
University of Buenos Aires
Buenos Aires, Argentina

**Mr. Terence Taylor**
Director
Global Health & Security Initiative
The Nuclear Threat Initiative
President and Director,
International Council for Life Sciences
Washington, DC

***Discussants***

**Ronald Atlas, Ph.D.**
American Society of Microbiology
Dean, Graduate School
University of Louisville
Louisville, KY

**Kavita Berger, Ph.D.**
Senior Program Associate
Center for Science, Technology and Security Policy
American Association for the Advancement of Science
Washington, DC

**Kenneth K. Bernard, M.D.**
Former Special Assistant to the President for Biodefense
Monterey, CA

**Gerald Epstein, Ph.D.**
Senior Fellow for Science and Security
Center for Strategic and International Studies
Washington, DC

**Margaret A. Hamburg, M.D.**
Chair
Board on Global Health
Institute of Medicine
National Academy of Sciences
Washington, DC

**Gabriele Kraatz-Wadsack, D.V.M., Ph.D.**
Chief
Weapons of Mass Destruction Branch
United Nations Headquarters
New York, NY

**Canice Nolan, Ph.D.**
First Counselor, Head of Food Safety, Health, and Consumer Affairs
Delegation of the European Commission to the U.S.A.
Washington, DC

**Robert E. Palazzo, Ph.D.**
President, Federation of American Societies for Experimental Biology
Provost
Rensselaer Polytechnic Institute
Troy, NY

**James E. Pearson, D.V.M.**
World Organization for Animal Health
Paris, France

**Michael Stebbins, Ph.D.**
Director of Biology Policy
Federation of American Scientists
Washington, DC

**Mr. Terence Taylor**
Director
Global Health & Security Initiative
The Nuclear Threat Initiative
President and Director
International Council for Life Sciences
Washington, DC

**Jonathan B. Tucker, Ph.D.**
Senior Fellow
James Martin Center for Nonproliferation Studies
Monterey Institute of International Studies
Washington, DC

**NSABB Members**

**David R. Franz, D.V.M., Ph.D.** ***(Chair)***
Vice President and Chief Biological Scientist
Midwest Research Institute
Frederick, MD

**Stuart B. Levy, M.D.** ***(Vice Chair)***
Director
Center for Adaptation Genetics & Drug Resistance
Professor of Molecular Biology, Microbiology and Medicine
Tufts University School of Medicine
New England Medical Center
Boston, MA

**Murray L. Cohen, Ph.D., M.P.H., C.I.H.**
President and Chairman
Frontline Healthcare Workers® Safety Foundation, Ltd.
Atlanta, GA

**Barry J. Erlick, Ph.D.**
President
BJE Associates, Inc.
Alexandria, VA

**Harvey Rubin, M.D., Ph.D.**
Director, Institute for Strategic Threat Analysis and Response
Professor of Medicine, Microbiology, and Computer Science
University of Pennsylvania
School of Medicine
Philadelphia, PA

**Anne K. Vidaver, Ph.D.**
Professor and Head
Department of Plant Pathology
University of Nebraska, Lincoln
Lincoln, NE

**Federal Agency Representatives**

**Dennis Dixon, Ph.D.**
Chief, Bacteriology and Mycology Branch
Division of Microbiology and Infectious Diseases
National Institutes of Health
Bethesda, MD

**Tom Hopkins, Ph.D.**
Assistant to the Secretary of Defense
Nuclear and Chemical and Biological Defense Programs (Acting)
Department of Defense
Washington, DC

**Peter Jutro, Ph.D.**
Deputy Director
National Homeland Security Research Center
U.S. Environmental Protection Agency
Washington, DC

**Mary Mazanec, M.D., J.D.**
Acting Director
Office of Medicine, Science & Public Health
Office of the Assistant Secretary for Preparedness and Response
U.S. Department of Health and Human Services
Washington, DC

**Jeff Miotke**
Deputy Assistant Secretary for Science and Health
U.S. Department of State
Washington, DC

**Janet K.A. Nicholson, Ph.D.**
Associate Director for Laboratory Science
National Center for Infectious Disease
Centers for Disease Control and Prevention
Atlanta, GA

**Scott Steele, Ph.D.**
NSTC Representative
Office of Science and Technology Policy
Executive Office of the President
Washington, DC

**NIH Office of Biotechnology Staff**

**Amy P. Patterson, M.D.**
Executive Director
National Science Advisory Board for Biosecurity
Director
Office of Biotechnology Activities
Office of Science Policy, Office of the Director
National Institutes of Health
Bethesda, MD

**Mary Groesch, Ph.D.**
Senior Advisor for Science Policy
Office of Biotechnology Activities
Office of Science Policy, Office of the Director
National Institutes of Health
Bethesda, MD

**Ronna Hill**
Program Assistant
Office of Biotechnology Activities
Office of Science Policy, Office of the Director
National Institutes of Health
Bethesda, MD

**Stuart L. Nightingale, M.D.**
Consultant
Office of Biotechnology Activities
Office of Science Policy, Office of the Director
National Institutes of Health
Bethesda, MD

**Allan Shipp, M.P.H.**
Director of Outreach and Education
Office of Biotechnology Activities
Office of Science Policy, Office of the Director
National Institutes of Health
Bethesda, MD

## Appendix C: Acronyms

| | |
|---|---|
| AG | Australia Group |
| BISO | Board on International Scientific Organizations |
| BWC | Biological and Toxin Weapons Convention |
| BWG | Biosecurity Working Group |
| CAS | Chinese Academy of Sciences |
| ChemRAWN | Chemical Research Applied to World Needs |
| CIS | Commonwealth of Independent States (formerly the Soviet Union) |
| COCI | Committee on Chemistry and Industry, IUPAC |
| CWC | Chemical Weapons Convention |
| DUR | Dual use research |
| DURC | Dual use research of concern |
| EASAC | European Academies Science Advisory Council |
| IAMP | InterAcademy Medical Panel |
| IAP | InterAcademy Panel on International Issues |
| ICLS | International Council for the Life Sciences |
| ICSU | International Council for Science |
| IFP | International Futures Program, OECD |
| IHRs | International Health Regulations |
| IUBMB | International Union of Biochemistry and Molecular Biology |
| IUMS | International Union of Microbiological Societies |
| IUPAC | International Union of Pure and Applied Chemistry |
| MECIDS | Middle East Consortium on Infectious Disease Surveillance |
| OECD | Organization for Economic Co-operation and Development |
| OPCW | Organization for the Prohibition of Chemical Weapons |
| RS | Royal Society |
| UN | United Nations |
| UNESCO | United Nations Educational, Scientific, and Cultural Organization |
| WHA | World Health Assembly |
| WHO | World Health Organization |

**Appendix D: Upcoming Meetings Scheduled by Organizations Represented at the Roundtable**

## *Upcoming Conferences, Congresses, Forums, and Workshops*

The following were mentioned at this Roundtable and are scheduled during the next 12 months:

- November 12-14, 2007 – Biosafety and Biosecurity International 2007: A Seminar for the Life Sciences and Policy Communities in the Gulf, Middle East, and North Africa; Abu Dhabi; www.biosafetyandbiosecurity-2007.org (Dr. Taylor)
- November 2007 – Workshop on laboratory biosafety and biosecurity, Ouagadougou, Burkina Faso, (WHO, Dr. Cosivi)
- December 2007 – Workshop on Research Policy and Management of Risks in Life Science Research for Global Health Security, Bangkok, Thailand (WHO, Dr. Cosivi)
- January 2008 World Health Organization Executive Board
- March 30 – April 2, 2008 – 2nd International Forum on Biosecurity, Budapest, Hungary; IAP, IAMP, IUMS, IUBS, and IUBMB the co-conveners.
- April 2008 – CWC second review conference (Dr. Malin)
- May 2008 – World Health Assembly, annual meeting (Dr. Cosivi)
- August 2008 – IUMS next scientific conference will take place in Istanbul, Turkey (Dr. Sordelli)
- August 2008 – BWC Intersessional Meeting of Experts
- 2008 – 33rd FEBS Congress/11th IUBMB Conference, Athens (Dr. Masters)
- 2008 – International biosecurity workshop in Beijing (CAS, Dr. Huang)
- 2009 – 21st IUBMB Congress, Shanghai (Dr. Masters)