# Meeting of the States Parties to the Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction

6 December 2010

Original: English

**2010 Meeting**
Geneva, 6–10 December 2010
Item 6 of the provisional agenda
**Consideration of the provision of assistance and coordination with relevant organizations upon request by any State Party in the case of alleged use of biological or toxin weapons, including improving national capabilities for disease surveillance, detection and diagnosis and public health systems**

## Background information on scientific and technological developments that may be relevant to the Convention: report on an international workshop in Beijing

**Submitted by the Implementation Support Unit**

*Summary*

From 31 October to 3 November 2010, the InterAcademy Panel (IAP), the International Union of Biochemistry and Molecular Biology (IUBMB), the International Union of Microbiological societies (IUMS), the Chinese Academy of Sciences (CAS), and the U.S. National Academies jointly hosted the international workshop "Trends in Science and Technology Relevant to the Biological and Toxic Weapons Convention", in Beijing, China. Government agencies, academic and research institutions, private sector companies, and non-profit organizations participated in this workshop. The workshop focused on two broad themes: advances in biology which might be misused to increase the biological weapons threat; and advances in detection and countermeasures that could improve efforts to address the threat.

## I. Convening organizations

1. The InterAcademy Panel (IAP) is a global network of the world's science academies, launched in 1993. Its primary goal is to help member academies work together to advise citizens and public official on the scientific aspect of critical global issues. IAP is particularly interested in assisting young and small academies achieve these goals and, through the communication links and networks created by IAP activities, all academies will be able to raise both their public profile amount citizens and their influence among policy



Please recycle

makers. The IAP executive council established a Biosecurity Working Group in 2004 to coordinate its activities in this area; its members are the academies of China, Cuba, Nigeria, Poland (Chair), the United Kingdom and the United States. The IAP and its member academies believe that science, scientific knowledge and scientific progress are an essential part of human culture and are vital to advance human welfare and well being. They also believe that the scientific method has much to offer in the pursuit of just and fair societies. These beliefs are the foundation of IAP and all it does. IAP is therefore committed to making the voice of science heard on issues of critical importance to the future of humankind.

2. The International Union of Biochemistry and Molecular Biology (IUBMB) comprises societies of biochemistry and molecular biology from 77 countries. Its mission is to further advancements in the biomolecular sciences through supporting growth and development in relevant fields of science. Founded in 1955, the IUBMB pursues its mission by focusing on improving biochemistry in less well developed countries; promoting international cooperation; promoting high standards in research, discussion, application, and publication; and establishing international standards in methods, nomenclature, and symbols. The IUBMB also focuses on promoting the norms, values, standards of ethics of responsible science.

3. Founded in 1927, the International Union of Microbiological Societies (IUMS) strives to promote the study of microbiology through international cooperation. In order to encourage international cooperation, the IUMS helps initiate, facilitate, and coordinate international research; helps disseminate results through international conferences; and represents microbiology in the International Council of Science. The IUMS also contains three divisions, six specialized international committees, eight international commissions and two international federations. These bodies are involved in various activities ranging from classification and nomenclature of microorganisms to education and outreach. One major feature of the IUMS is the promotion of safe and ethnical research in the field of microbiological science, in particular on biosecurity and biosafety. The IUMS encourages its members to adopt a Code of Ethics to prevent the misuse of scientific knowledge and resources, in order to prevent the use of biological weapons and to protect the public's health.

4. The Chinese Academy of Sciences (CAS) is the leading national academic institution and research centre focusing on natural sciences, technology, and high-tech development. The CAS was founded in 1949; its mission is to conduct research on technological science, survey natural resources in China, assist in public policy decisions by providing scientific data, initiate personnel training, and promote China's high-tech enterprises. For the future vision of CAS, the Academy hopes to develop itself to become a base for the development of China's advance technology industries. Already by 2010, CAS has developed 80 national institutes dedicated to developing innovated new technologies.

5. The National Academies of the United States of America consists of four organizations: the National Academy of Sciences, the National Academy of Engineering, the Institute of Medicine and the National Research Center. The main focus of the National Academy of Sciences is on scientific and engineering research, specifically on science and technology that can be used for the general welfare. In addition, the National Academy of Sciences is required to advise the US federal government on scientific and technological matters. The National Academy of Engineering also joins the National Academy of Sciences in advising the federal government, in addition to its responsibility to sponsor engineering programs. The Institute of Medicine is dedicated to the examination of policies that pertain to the health of the public. The Institute advises the government on these issues. The National Research Council is the principal operating agency through which the National Academies of the Sciences and Engineering operate.

## II. The Beijing workshop

6. The first day of the workshiop addressed advances in the life sciences that might be misused to improve existing biological weapons, or to develop new weapons. Relevant areas of development were grouped as either being relevant to: design, fabrication and production; or to dispersal and delivery. The sessions devoted to the first area looked at: bioinformatics and computations tools; systems biology; synthetic biology; bioreactors and transgenic animals; transgenic plants and recombinant pharmaceuticals; as well as developments in neuroscience. The sessions on dispersal and delivery reviewed aerosols and aerobiology; as well as nanocomposites as delivery systems.

7. The second day of the workshop focused on the developments that might reduce the utility, or mitigate the impact of biological weapons. A session on detection, identification and monitoring looked at: postgenomic technologies; bioforensics; trends in biosensors; biosensor development; and a case study of the real-world application of some of these technologies. A second session on defence and countermeasures looked at: vaccines and medical countermeasures; advances in virology and biological control; monitoring and molecular diagnostics of emerging infections; and agricultural security issues.

8. The workshop also included a session on science communication that examined: how the Internet has changed scientific interchanges; the influence of technology on scientific collaboration; and conveying the concept of risk.

9. The meeting used breakout sessions to foster discussion amongst participants. A breakout session was held for each of the two major themes of the meeting. Participants were divided amongst a number of groups, each with around 20 members. Each group focused on a common set of questions (see Annex).

## III. Outcome of the workshop

10. The convening organizations are developing a report of the meeting that will provide details of the areas covered and the discussions that took place. The report will focus on identifying advances in science and technology that might be relevant to the Convention and their potential implications. The report will not make policy recommendations. Some initial insights drawn from the meeting, by some of those present, will form the basis of a side event at the Meeting of States Parties (09.00 – 10.00 Wednesday 8 December 2010). When available, the report of the workshop will be made available to States Parties and fed into preparations for the Seventh Review Conference.

# Annex

## Breakout Session Questions

### Breakout Session 1: Possibilities for Malign Application

1. Drawing from the plenary lectures and discussion as well as your own experience, what are the most important new S&T development from the past five years in the areas discussed during Plenary Session 2, 3, and 4, and what are the likely major development over the next five years?

2. Are those changes likely to affect the development or emergence of concepts, materials, or delivery mechanism related to biological weapons? How can that be determined?

3. Are there technical hurdles that must be overcome before these development should be considered a cause for concern?

4. As there areas continue to advance, how can future developments be tracked and evaluated with respect to potential use in construction or dissemination of a biological weapon or as defences and countermeasures?

### Breakout Session 2: Possibilities for Addressing the Biological Weapons Threat

1. Drawing from the plenary lectures and discussion as well as your own experience, what are the most important new S&T development from the past five years in the areas discussed during Plenary Session 5, 6, and 7, and what are the likely major development over the next five years?

2. If these developments pose a potential threat, how might they affect biodefense and mitigation capabilities globally? Are there developments in defences and countermeasures that will likely be able to address these emerging concerns? To what extent might these developments provide defensive or response capabilities that can mitigate threats posed by technologies discussed earlier in this meeting?

3. What gaps, if any, might need to be filled or technical hurdles overcome to provide effective responses to the development described in the plenary sessions?

4. As these areas continue to advance, how can future developments be tracked and evaluated with respect to potential use in construction or dissemination of a biological weapon or as defence and countermeasures?