

INTERNATIONAL NETWORK OF ENGINEERS AND SCIENTISTS FOR GLOBAL RESPONSIBILITY



(INES)

INES Office Glinkastr. 5, D-10119 Berlin, Germany
Phone: +49 (0)30 20 65 38 31; Fax: +49 (0)30 20 65 38 37
E-mail: ines.office@web.de; www.inesglobal.com

Statement of the INES Working Group on Biological and Toxin Weapons Control, prepared for the Sixth Review Conference of the Biological and Toxin Weapons Convention, November 20 – December 8, 2006, Geneva

Mr. President, Excellencies, Distinguished Representatives, Ladies and Gentlemen,

We at INES do appreciate very much this opportunity to express our views to you at this Sixth Review Conference of the Biological and Toxin Weapons Convention (BTWC).

Mr. President,

The hallmark of the advances in science and technology in recent years is the continued accelerating pace with which knowledge is being accumulated, especially knowledge about the molecular mechanisms of life's fundamental processes.

The knowledge gained is absolutely essential in order to counter disease and improve health in general. However, since much of this work has the potential to be misused, we have to be concerned about the possible misuse of such information for non-peaceful purposes.

This dilemma is particularly evident the emerging technology of **synthetic biology**, which is "on the threshold of synthesizing new life forms".¹ Synthetic biology² is the design and assemblage of interacting genes into circuits in order to direct cells to perform new tasks. It has opened up extraordinary possibilities for biomedicine and environmental engineering, but the scope for misuse or inadvertent disaster could be huge.

Mr. President,

We not only have to be concerned about the rapidity of developments, but also about the complexity of the knowledge generated. This complexity is reflected in developments of the relatively new field of **systems biology**. Systems biology looks at interacting physiological systems and tries to understand how they function as a whole. An example is the interdependent interaction of such vital physiological systems as the immune system, the nervous system and the endocrine system. The functions of all three systems are regulated to a great extent through biochemical substances including cytokines, hormones, neuropeptides and neurotransmitters which act through their receptors found on cells and organs in all three systems.³ The manipulation or perturbation of the elements of one system with bioregulators will invariably affect the operation of the others, so it is easy to see that the possible ways in which these systems can be malignantly manipulated suddenly take on a whole new dimension.

¹ Ball, P. (2004) Starting from scratch. *Nature*, vol. 431, pp. 624-626.

Endy, D. (2005) Foundations for engineering biology. *Nature*, vol. 438, pp. 449-453.

³ Straub, R.H., Westermann, J., Schölmerich, J., and Falk, W. (1998) Dialogue between the CNS and the immune system in lymphoid organs, *Immunology Today*, vol. 19, pp. 409-413.

Trying to deal with this complexity, in order to exploit the benefits of advances in science and technology while minimizing the risks, without impeding vital progress, is going to become more and more difficult with time.

Mr. President.

The use of such bioactive substances for good or evil depends to a great extent upon the feasibility of targeted delivery. There is a growing potential for greatly improved methods of aerosol delivery of bioactive substances. Advances in **nanotechnology** combined with new methods for making substances absorbable through the nasal and respiratory tracts represent such growing potential for delivery.^{4,5} Drug delivery is making great strides in this direction.

Equally great strides are being made in the use of **viral vectors as gene ferries** for purposes of immunization or gene therapy. In this regard, manipulation of viruses to re-direct them to infect specific tissues or cells (changing the tropism of viruses) is being actively researched.'

Mr. President,

INES wishes to make three specific **Proposals**

1. It is imperative for the States Parties at the Sixth Review Conference to ensure that there will be a Final Declaration with language in the Article I section on prohibitions that embraces all developments in the life sciences over the past 10 years. An augmentation of the statement covering new developments at the Fourth Review Conference could read:

The Conference, conscious of apprehensions arising from relevant scientific and technological developments, inter alia, in the fields of microbiology, biotechnology, molecular biology, genetic engineering, *systems biology*, *synthetic biology*, *nanotechnology*, and any applications resulting from genome studies, and the possibilities of their use for purposes inconsistent with the objectives and the provisions of the Convention, reaffirms that the undertaking given by the States Parties in Article I applies to all such developments.

2. Given the accelerating pace of developments in science and technology, as well as the complexity of the knowledge gained, the five-year mechanism for review of science and technology of relevance to the BTWC is increasingly inadequate. States Parties to the BTWC should carry out thorough reviews and analyses of advances in science and technology relevant to the Convention at more frequent intervals than just at the Review Conferences. Since these developments are of acute concern to all States Parties to the BTWC, a mechanism should be established whereby delegations can collectively and interactively respond to these analyses.

3. In addition, State Parties should assess whether the provisions of Article I have been implemented effectively by national legislation and that such legislation will embrace all new developments. National implementation of the prohibitions and obligations in the Conventions has been unsatisfactory for both the BTWC and the Chemical Weapons

⁴ Johnson, P.H. and S.C. Quay (2005) Advances in nasal drug delivery through tightjunction technology. *Expert Opinion on Drug Delivery*, vol. 2, pp. 281-298.

⁵ Köping-Höggard, A. Sanchez and M.J. Alonso (2005) Nanoparticles as carriers for nasal vaccine delivery. *Expert Review of Vaccines*, vol. 4, pp. 185-196.

⁶ Cronin, J., X.Y. Zhang and J. Reiser (2005) Altering the tropism of lentiviral vectors through pseudotyping *Current Gene Therapy*, vol. 5, pp. 387-398.

Convention (CWC). The CWC at least has a specific action plan for attacking this problem.⁷ States Parties at this Review Conference need to take steps to address effective national implementation of the Convention. INES heartily supports the proposal by the EU⁸ for an "Implementation Support Unit" for the BTWC hosted by the UN Department of Disarmament Affairs in order to aid implementation of the provisions of the Convention.

Thank you, Mr. President.

The INES Working Group on Biological and Toxin Weapons Control
Contact: Kathryn Nixdorff, Ph.D., Professor
Department of Microbiology and Genetics
Darmstadt University of Technology
Schnittspahnstr. 10
D-64287 Darmstadt
Germany
Tel. +49-(0)6151-164210, Fax: +49-(0)6151-162956
e-mail: nixdorff@bio.tu-darmstadt.de

⁷ Spence, S.: Achieving Effective Action on Universality and National Implementation: the CWC Experience. Briefing Paper No. 13. Bradford: University of Bradford (April 2005).

⁸ The Netherlands, 19th September 2006. EU paper on implementation: need for a concerted and coordinated approach. BTWC 6th Review Conference 2006. EU_WP_06.