

SCIENTIFIC AND TECHNOLOGICAL DEVELOPMENTS RELEVANT TO THE BIOLOGICAL WEAPONS CONVENTION

Submitted by the Czech Republic

1. In preparation for the Sixth Review Conference on the Biological and Toxin Weapons Convention (BTWC), the Czech Republic would like to provide the following information on new scientific and technological developments relevant to the BTWC.
 2. Since the 2001 Review Conference, the Czech scientific institutions have participated in significant scientific and technical advances relevant to the BTWC mainly in the area of **biotechnology**.
 3. There has been marked progress in the **development of antiviral drugs**, especially **reverse transcriptase inhibitors, DNA polymerase inhibitors or protease inhibitors**. The drug's parent compounds of VIREAD (*tenofovir disoproxil fumarate*) and HEPSERA (*adefovir dipivoxil*) are the result of a collaborative research effort of Czech and foreign scientists. *VIREAD* is a reverse transcriptase inhibitor that is active against the HIV reverse transcriptase and is the first nucleotide reverse transcriptase inhibitor to be approved for the treatment of HIV disease. *HEPSERA*, a nucleotide analogue for the treatment of chronic hepatitis B, works by inhibiting HBV DNA polymerase, an enzyme involved in the replication of the virus in the body.
 4. There is a growing interest in **bioremediation technologies** as well. The Czech scientists have invented the **technology for detoxification of mustard gas** (yperite). This technology is based on fast, non-corrosive and environment-friendly enzymatic catalysis. In this method, the enzymes, called haloalkane dehalogenases, rapidly turn mustard gas into a harmless product. The testing under laboratory conditions confirmed high efficiency of the enzymes to destroy mustard gas but it is difficult to estimate how long it will take from a laboratory to practical application as means for neutralisation of aging stockpiles of mustard gas or in case of a bioterrorist attack. This and other bioremediation methods have the potential for adoption as means for neutralisation of chemical agents related to the provisions of Chemical Weapons Convention (CWC).
 5. The research of **haloalkane dehalogenases activities** has brought another possibilities of their practical application. Among them there are production of **optically active alcohols** that can be used in treating Alzheimer's disease or biosensors to detect chemicals in the environment.
 6. All of the scientific and technological developments in the Czech Republic described above are encompassed comprehensively under Article I of the BTWC.
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