US rejects stronger bioweapons treaty

Despite 6 years of international negotiation, the United States has rejected a Protocol to strengthen the Biological Weapons Convention (BWC). The draft Protocol "will not enhance our confidence in compliance and will do little to deter those countries seeking to develop biological weapons," US ambassador Donald Mahley, special negotiator for chemical and biological arms control issues, told the Ad Hoc Group of the BWC State Parties.

The news has been received with huge disappointment. "What our administration has done is dangerous," says Matthew Meselson, co-director of the Harvard Sussex Program on CBW Armament and Arms Limitation, "the chemical weapons convention [CWC] helps deter states from making chemical weapons—a strong bioweapons protocol could add to the deterrence of bioweapons, which are a much greater threat."

The BWC came into force in 1975 and now has 143 state parties—including the US, the EU, Australia, and Japan, but notably not Israel. However, although it prohibits biological and toxin weapons, the absence of provisions to monitor and verify compliance means the BWC is little more than a gentleman's agreement not to exploit biotechnology for hostile purposes. Policing compliance is a challenging problem because of the "dual-use" nature of biotechnology—facilities for the production of biological agents closely resemble those for "legitimate" purposes such as vaccine production. Thus an Ad Hoc Group has been negotiating a Protocol, under which convention signatories would declare such dual-use facilities, which could then be subject to random "transparency visits," or "clarification visits" (should questions arise), or "investigations" (if noncompliance is suspected). The subject has been widely debated, and, concerned about the potential loss of trade secrets, the US Pharmaceutical Research and Manufacturers of America (Washington, DC) has lobbied for visits to be limited to those supported by evidence of treaty violation (*Nat. Biotechnol.* **16**, 14, 1998).

On July 25, the US rejected not only the Protocol but also the whole approach to it. "In our assessment, the draft Protocol would put national security and confidential business information at risk," said Mahley. "If we are to find an appropriate solution to the problem, we need to think 'outside the box'." But those involved in the negotiations question his logic. The US government "has shown massive misinformation and misunderstanding…the question arises whether disinformation is being practiced," says Graham Pearson, visiting professor of international security at the University of Bradford (UK).

For instance, among Mahley's cited concerns is that commercial proprietary information in the US biotech industry would not be protected under the visits system. However, Pearson points out that under the protocol, seven is the maximum number of visits the US biotech industry could have in any year, compared to 22,000 annual FDA inspections of US facilities, "which are far more intrusive." In addition, such agents as toxins, bioregulators, and peptides come under not only the BWC but also the CWC, which already has provisions for inspections of manufacturing facilities.

Without a Protocol to strengthen it, the BWC is little more than a gentleman's agreement not to exploit biotechnology for hostile purposes.

Another US concern is that declarations of biodefense facilities and activities would lead to a loss of national security. But Pearson points out that the Protocol requires no classified information and that the US is already far more open to the public about its program than any other nation.

"Without a Protocol to the Convention, biological weapons will continue to present the greatest danger of all weapons of mass destruction," says Pearson. A particular concern is the unpredictable nature of biology and the use of genetic engineering in the production of pathogens with new characteristics. For instance, earlier in the year, researchers in Australia accidentally engineered a "killer virus" that wiped out all of their experimental mice (*Nat. Biotechnol.* **19**, 97, 2001). While researching sterility in rodents, scientists inserted a gene for interleukin-4 into a mousepox virus to stimulate antibodies against eggs in mice subsequently injected with the virus. However, the engineered virus was much more virulent than intended, suppressing all cell-mediated responses against viral infection and killing all the mice (*J. Virol.* **75(3)**, 1205-1210, 2001).

More recently, on July 24, London University's Imperial College was ordered to pay nearly £65,000 in fines and legal fees after pleading guilty at Blackfriars Crown Court to breaching the 1992 Genetically Modified Organisms (Contained Use) Regulations, risking the release of a GM hybrid into the environment. The laboratory work involved splicing together a novel combination of genes from two viruses, hepatitis C and Dengue fever, and there was a failure to take appropriate containment measures to ensure the safety of this work. The Health and Safety Executive, which intervened to shut down the experiment, reportedly told the court that the target tissue in which such a hybrid would reproduce was unpredictable.

Meselson points out that every major technology that humans have developed—from stone work and metallurgy to explosives and electronics—has been applied to major hostilities, and that it's a great challenge to keep the modern genomics revolution from going the same way. Such scientific advances were discussed at a workshop in Prague at the end of May to ensure they are encompassed by the convention. The fear is that advances in genomics and proteomics is increasing the threat of biological weapons by opening up a cornucopia of new possible ways in which the misuse of biology could take place. "Biotechnology has capabilities to change what it is to be human," says Meselson, eventually "you could be manipulating populations instead of just attacking them."

However, experts say the dangers from genomics shouldn't be overstated: Although genomic advances could bring certain potentially dangerous ideas to life, developing environmentally stable weapons for use in warfare would be very difficult and extremely expensive—something only a national budget could support, according to Sebestyen Gorka, executive director of the US council for emerging national security affairs. And engineered viruses or toxins that affect only certain ethnic groups are currently science fiction. Moreover, "if man can make it he can break it…it's not going to be a one-way dangerous development," says Gorka. Others point out that "traditional" biological agents, such as anthrax, which have undergone extensive trials, pose a greater threat. Still others say chemical or nuclear weapons are much easier and more straightforward to use for mass destruction (although their treaty regimes are much stronger than those of the BWC).

It is hoped the US reconsiders its position before the November 19 start of the Fifth BWC review conference. Meselson hopes the "EU go ahead anyway and create a kind of demonstration protocol" that the US could join later.

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