

## **SCIENCE AND TECHNOLOGY**

- Mr. Vice-Chairman, we are very pleased that the new intersessional process includes ongoing, specific attention to developments in science and technology, and delighted to see you assisting our chair Ambassador Delmi.
- This year, we agreed to pay particular attention to “enabling technologies” – the basic, underlying technologies that support much of the ongoing revolution in the life sciences.
- The United States would like to thank the Inter-Academy Panel for organizing yesterday’s side event on enabling technologies. If we are to have serious discussions on developments in science and technology, we need to hear regularly from the scientific community. This Convention is among governments – States Parties – but we cannot do our jobs without input and participation of scientists.
- My delegation submitted a working paper on this agenda item, which made several recommendations to contribute to our goal of increasing common understandings and promoting effective action. I would like to highlight a few points here:

### **ENABLING TECHNOLOGIES**

- While developments in enabling technologies rarely raise questions about the SCOPE of the BWC, they may well have implications for how we IMPLEMENT the Convention. They affect not only the pace of developments in the life sciences, but also how science is conducted and applied. This underscores the need for States Parties to regularly review their domestic implementation of the Convention.
- One example of this is the increasing use of gene synthesis technology in the life sciences. This is a powerful technology with many positive applications, and enables important research. It does, however, have some potential for misuse – for example, it could be used to synthesize a pathogen – even an eradicated pathogen – creating new proliferation pathways.
- The U.S. has sought to address this risk in ways that can adapt to a rapidly changing industry, and that would minimize impact on the exchange of materials and information for peaceful purposes. After extensive consultation with stakeholders, in 2010 the U.S. Federal government issued

“Screening Framework Guidance for Providers of Synthetic Double-Stranded DNA” – a set of non-binding guidelines that are used to screen synthetic DNA orders to identify possible concerns. Both the customer and the specific sequence ordered are evaluated: Does the sequence encode a high consequence pathogen or toxin, or an important element of such a pathogen’s genetic code? Is it reasonable that the customer placing the order would require this pathogen and can handle it safely?

- We are currently in the process of evaluating the degree to which the industry has adopted these guidelines, and their impact, to determine whether further steps are warranted.
- While gene-length synthesis was originally available from only a few companies, in a few countries, current developments in the field may be changing that. Accordingly, we believe BWC States Parties should, at the national level, examine whether any steps—such as sequence and customer screening processes—are necessary.

## **S&T DEVELOPMENTS WITH POTENTIAL BENEFICIAL APPLICATIONS**

- Mr. Vice-Chairman, I’d also like to briefly highlight a few recent developments in science and technology with beneficial applications. It’s important to remember that one of the obligations under Article X of the Convention is to contribute to the advancement and application of the life sciences for peaceful purposes.
- On July 9, the National Institute of Biomedical Imaging and Bioengineering announced that researchers funded by NIH have developed a new, silk-based stabilizer for vaccines and antibiotics. In laboratory tests, this kept some vaccines and antibiotics stable at temperatures of up to 140 degrees fahrenheit. This opens the door to eliminating “cold chain” refrigeration requirements, which could save billions of dollars and greatly improve access in rural areas of developing countries.
- A research team at a university in Georgia has developed biodegradable microneedles. These can be coated with a vaccine or other treatment. They apply easily, and dissolve within days. Microneedle technology also promises to eliminate “cold chain” requirements in some cases—and may also help to stretch limited supplies of vaccines or other treatments, because it produces a much more efficient immune response than conventional

injection, potentially reducing the amount of vaccine required per person. Again, implications for developing countries seem particularly important.

- Finally, I'd like to point to a recent report by the American Academy of Microbiology, which sets out a road map for applying recent advances to develop point-of-care diagnostic systems suitable for resource-limited settings.
- Mr. Vice-Chairman, my delegation will also have comments on issues associated with national biorisk management, codes of conduct, and outreach and education, which we will turn to in tomorrow's session.