

Synthetic Biology and the Biological Weapons Convention

The Biological Weapons Convention (BWC) opened for signature in 1972 and entered into force in 1975. It was the first multilateral disarmament treaty banning an entire category of weapons. It effectively prohibits the development, production, acquisition, transfer, retention, stockpiling and use of biological and toxin weapons and is a key element in the international community's efforts to address the proliferation of weapons of mass destruction. The BWC is charged with keeping abreast of relevant developments in science and technology and ensuring that the life sciences continue to be used solely for the benefit of humanity.

Advances in a range of scientific disciplines are coming together to offer new ways of doing and thinking about biology. As our understanding of scientific disciplines have developed in the past, so has our ability to apply them in ways to make our lives better and easier – culminating in an associated engineering discipline– first came Newtonian physics, which gave us mechanical engineering; next the discovery of electricity brought us electrical engineering; developments in chemistry conferred chemical engineering – if those is the know are to be believed, progress witnessed in biology in recent years is, for the first time, presenting us with possibilities to engineer biology.

Biological engineering (or synthetic biology) would enable a design orientated approach to the production of biological entities – from ‘what can I make this bacteria do?’ to ‘I need a bacteria to do X, how do I make it?’. It expands upon genetic engineering techniques to: make it easier to build things; define the things being used to do the building; and handle highly complicated information in a non-specialist setting. It has the potential to bring biology out of the laboratory into our everyday lives.

All advances bring with them the potential for use for hostile or malign purposes. There is no reason why the establishment of a biological engineering discipline should be any different – except in this case it would breach international law. The ban on biological weapons is absolute – biology must only used for peace. It is necessary to think hard and early about how we can ensure this norm is maintained into the era of synthetic biology.

The community developing biological engineering has taken unprecedented steps to consider the social implications of their work and has reached out to several stakeholder communities to work together to ensure synthetic biology remains safe, secure and pursued solely for our collective benefit. The BWC is presented with an unique opportunity to partner with this community to build bridges between scientists and policy makers. Developing new ways of working together is a necessity in efforts to revitalize arms control and disarmament to best fir the requirements of international security in the 21st century.
