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# Synthetic Biology: scientists gone wild

Beitragende: Action Group on Erosion, Technology, and Concentration (ETC)

TORONTO— A new report by the ETC Group concludes that the social, environmental and bio-weapons threats of synthetic biology surpass the possible dangers and abuses of biotechnology.

The full text of the 70- page report is available free on the ETC Group website:

[Extreme Genetic Engineering: An Introduction to Synthetic Biology](#)

"Genetic engineering is passé," said Pat Mooney, Executive Director of ETC Group. "Today, scientists aren't just mapping genomes and manipulating genes, they're building life from scratch—and they're doing it in the absence of societal debate and regulatory oversight."

*Synbio*—dubbed "genetic engineering on steroids"—is inspired by the convergence of nano-scale biology, computing and engineering. Using a laptop computer, published gene sequence information and mail- order synthetic DNA, just about anyone has the potential to construct genes or entire genomes from scratch. Of course, that includes the genomes of lethal pathogens.

Scientists predict that within two to five years it will be possible to synthesise any virus; the first de novo bacterium will likely make its debut in 2007; in five to ten years simple bacterial genomes will be synthesised routinely and it will become no big deal to cobble together a designer genome, insert it into an empty bacterial cell and—voilà—give birth to a living, self-replicating organism.

Other synthetic biologists hope to reconfigure the genetic pathways of existing organisms to perform new functions—such as manufacturing high-value drugs or chemicals.

A clutch of entrepreneurial scientists, including the gene maverick J. Craig Venter, is setting up synthetic biology companies backed by government funding and venture capital. They aim to commercialise new biological parts, devices and systems that don't exist in the natural world—some of which are designed for environmental release.

Advocates insist that synthetic biology is the key to cheap biofuels, a cure for malaria, and climate change remediation—media-friendly goals that aim to mollify public concerns about a dangerous and controversial technology.

Ultimately synthetic biology means cheaper and widely accessible tools to build bioweapons, virulent pathogens and artificial organisms that could pose grave threats to people and the planet. The danger is not just bio-terror, but "bio-error."

Despite calls for open source biology, corporate and academic scientists are winning exclusive monopoly patents on the products and processes of synthetic genetics. Like biotech, the power to make synthetic life could be concentrated in the hands of major multinational firms.

As gene synthesis becomes cheaper and faster, it will become easier to synthesise a microbe than to find it in nature or retrieve it from a gene bank. Biological samples, sequenced and stored in digital form, will move instantaneously across the globe and be resurrected in corporate labs thousands of miles away—a practice that could erode future support for genetic conservation and create new challenges for international negotiations on biodiversity.

"Last year, 38 civil society organizations rejected proposals for self-regulation of synthetic biology put forth by a small group of synthetic biologists," said Kathy Jo Wetter of ETC Group. "Widespread debate on the social, economic and ethical implications of synbio must come first, and it must not be limited to biosecurity and biosafety issues."

The tools for synthesising genes and genomes are widely accessible and advancing at break-neck pace. ETC Group's new report concludes that it is not enough to regulate synthetic biology on the national level.

Decisions must be considered in a global context, with broad participation from civil society and social movements. In keeping with the Precautionary Principle, ETC Group asserts that—at a minimum—there must be an immediate ban on environmental release of de novo synthetic organisms until wide societal debate and strong governance are in place.

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