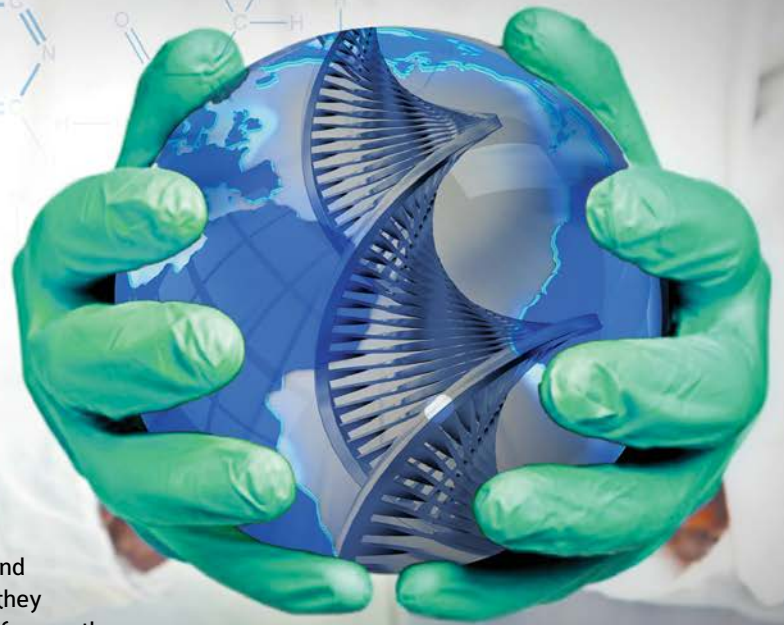




**Friends of
the Earth**

THE EMERGING TECH PROJECT



Regulation all too often lags behind technology development and commercialisation. Often new innovations aren't banned until they have been proven to be harmful – and even then corporations frequently and fiercely resist regulation. DDT, thalidomide, asbestos, cane toads are all classic examples of what can go wrong when the precautionary principle is not applied and new innovations are launched without adequate safety testing.

A suite of powerful new emerging technologies means that the stakes of such uncontrolled experiments are now significantly higher. The unexpected consequences of some of these technologies could have global ramifications.



GEOENGINEERING

Geoengineering is the intentional and large-scale manipulation of the earth's systems, including climate systems. The abject failure of the global community to tackle climate change means we have reached the point where drastic cuts to greenhouse gas emissions are needed quickly.

Geoengineering is attracting attention and some support because some in industry and government want 'solutions' that don't require a reduction in emissions, consumption, or the unsustainable exploitation of the Earth's resources.

However, many geoengineering proposals involve high risks that are poorly understood and their efficacy is uncertain at best. The false promise of such techno-fixes is also likely to make real measures for addressing climate change much harder to achieve.

SYNTHETIC BIOLOGY

The field of synthetic biology (synbio) is evolving so rapidly that even scientists working

in it don't agree on a definition, but in essence it is an extreme version of genetic engineering. Instead of swapping genes from one species to another (as in genetic engineering), synthetic biology creates entirely new forms of life - or reprograms organisms to do things that would not naturally occur. It uses a variety of techniques, including constructing synthetic (human made) DNA.

Synthetic biology creates highly novel, living artificial organism that may persist and reproduce in nature. There exists no guidance on how to assess and manage the biosafety risks posed by these organisms. Existing regulations to govern genetic engineering were developed before the advent of synbio and are inadequate to deal with the risks posed by the technology. Synthetic biology companies now produce hundreds of thousands of new strains of bacteria, yeast and algae per day, raising serious questions about monitoring, recall and liability.

Synthetic biology is about to enter the market via new ingredients for food, cosmetics and household products. These new ingredients, including synbio versions of vanilla, stevia and

saffron flavorings for food and beverages, and ingredients for cosmetics and cleaning products, are produced by synthetically engineered organisms, including synbio yeast and algae that are raised in vats and fed on sugar.

NANOTECHNOLOGY

Nanotechnology refers to the manipulation of matter on the scale of the nanometer (one billionth of a meter). The properties of matter change at the nano-scale and nanomaterials can behave quite differently to larger particles of the same substance. Nanomaterials also have a far greater surface area relative to volume which makes them much more chemically reactive than larger particles.

Nanomaterials pose new threats to human health and the environment. This is why in 2004 the UK Royal Society called for a moratorium on the commercial use of nanomaterials until the risks associated with them could be properly assessed and their safety established. Ten years on nanomaterials are now used in a wide range of consumer products and yet still remain largely unregulated.

Currently, there are no other environmental groups in Australia working on these issues.

TECHNOLOGY SHOULD SERVE THE PUBLIC GOOD

With the increasing withdrawal of government funding for public interest research, the development of new technologies is being increasingly driven by the desire for corporate profits rather than public good.

Governments have also been reluctant to regulate new technologies in response to industry arguments that regulation will stifle innovation, and risk the competitive advantage of our industries. This has meant that

corporations have been the primary beneficiaries of new technologies, while society as a whole and the environment have borne the risk.

Now it is time for a technological re-think. New high-risk technologies, ranging from the very small (synthetic biology, nanotechnology) to the very large (geoengineering), are rapidly developing. There are very real concerns that these new technologies may be released unilaterally, or with no

public awareness or consent, and that some these new technologies may have unintended and global consequences.

Without the strict application of the precautionary principle; a shift in governance so that public not corporate interests prevail; and a transparent and participatory form of technology assessment; applications of some of these new technologies are likely to wreak even more havoc on our fragile planet.



FRIENDS OF THE EARTH WILL:

- > Campaign for a public interest and precautionary approach to the development and commercialisation of new technological applications;
- > Campaign for a reduction in corporate control and influence over governments and scientific research, and build support for public good science within the academic and scientific communities;
- > Build popular support for our vision of what the effective regulation of emerging technologies could look like.



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