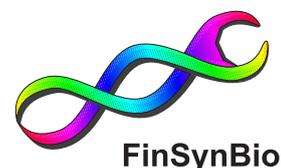


## SYNTHETIC BIOLOGY AND ETHICS (SynBioEthics)



FinSynBio

*Principal Investigator: Matti Häyry*

Synthetic biology has been said to represent the second ethical quantum leap in biology. The first occurred when scientists started to genetically modify life by recombining the DNA of different species thirty years ago. In synthetic biology, scientists can now introduce into the building blocks of organisms elements that would not have been there naturally. The creation of the first organism – a bacterial cell – controlled by a chemically synthesised genome was reported by the J. Craig Venter Institute in 2010.

Commentators have recognised both the promises and threats of synthetic biology. The promises include the development of drugs for lethal diseases like malaria, the invention of efficient and economic biofuels, and the production of bioremediators that would break down environmental toxins or fight cancer cells. The envisaged threats range from the symbolic fear of creating life artificially (and thereby playing god or disrupting the cosmic order of things) to bioterrorism through letting knowledge of the preparation of biological weapons fall into the wrong hands.

SynBioEthics studies the ethical questions surrounding synthetic biology through two strands. The first is a collaborative effort with



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the other teams of the FinSynBio programme. We conduct interviews and small-scale surveys to outline the main ethical concerns of the scientists of the projects; and inform them of the concerns that they and others have regarding research and development in the field. This work centres on four questions: Is it useful? Is it dangerous? Who benefits and who bears the burdens? Are moral boundaries transgressed by it?

The second strand of our research is philosophical. We study the conceptual arguments that have been employed to criticise synthetic biology on moral grounds. Are there moral limits to the human will to control nature, including the most

elementary constituents of life, or should we be allowed to rewrite the natural order? Is the creation of life out of inanimate elements something that we should attempt to do, or does this mean going beyond our jurisdiction? Are we interrupting millions of years of natural evolution by producing novel life forms, and if we are, does this present a moral problem? If and when synthetic biology is applied to human beings, are we in danger of altering humanity in ways that we should not alter it? And what are the implications of synthetic biology and its implementation to the distribution of material and other goods in our societies, i.e. its impacts on justice?

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