



Synthetic biology and ethics

(SYNBIOETHICS)

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Our credentials

Academy of Finland

- **Genetics, 1997–2000**
- **Life 2000, 2000–2003**
- **Systems biology, 2004–2007**
- **Neuroscience 2008–2011**

Europe

- **BIOMED 1, BIOTECH, BIOMED 2**
- **Framework Programmes**

United Kingdom

- **Wellcome Trust, 2009–2014**

So far

- **Literature reviews of the ethical issues**
- **Figuring out what synthetic biology is**
- **Informal interviews with team representatives**
- **Figuring out what the FinSynBio teams do**
- **Coming up with an ethical framework**

Ethical checklist

- **Is it useful?**
- **Is it dangerous?**
- **What is the cost?**
- **Who pays, who benefits?**
- **Is it somehow morally wrong?**

Is it useful?

- **Does it contribute to scientific knowledge?**
- **Can it be expected to promote human well-being?**
- **Or animal well-being?**
- **Or ecological sustainability?**

Is it dangerous?

- **Is someone or something hurt in the laboratory?**
- **Are somebody's rights (perhaps intellectual property rights) violated?**
- **Can something dangerous accidentally escape from the laboratory? (A GMO?)**
- **Can someone release something dangerous intentionally (if they so wanted)?**
- **Will the knowledge itself be dangerous in the wrong hands? (Internet anthrax.)**
- **Is it the scientists' fault?**

What is the cost?

- How much does it cost?
- Could the resources have been used more profitably in other areas of science?
- Is that for us to say?
- Or elsewhere? (Digging wells in Africa.)
- Is this a fair comparison?

Who pays, who benefits?

- **Is there a discrepancy between net payers and net beneficiaries?**
- **Are certain (perhaps vulnerable) groups of people studied to benefit only or mainly other (not so vulnerable) groups of people?**
- **If so, is it wrong? Or right?**
- **Are certain groups of people (say, tax payers) asked to finance work that will benefit mostly others (say, multinational corporations and their stockholders)?**

Is it somehow morally wrong?

- **Does it treat humanity or life as dispensable?**
(Like HESCR, allegedly.)
- **Does it cross a boundary that should not be crossed?**
(Is life created? Is the natural history of evolution disrupted?)
- **Is it playing god?**
(Omnipotence and omniscience vs. precaution.)
- **Is it unnatural?**
(Does it threaten people's beliefs – like IVF, for a while?)

Quick questions

0. What is your primary field of study?

1. How much will your current research contribute *to scientific knowledge*?

2. How much will your current research promote *the good of humanity*?

3. In *the best possible world*, how useful would your current research be?

4. How dangerous is your research to you and others *in the laboratory or clinic?*

5. How dangerous are the *intended* applications of your research *to others*?

6. How dangerous are the *unintended* applications of your research to others?

7. How *ethical* is your research?

8. Is there an ethical question in your work that you would like *us* to consider?

Thank you!

Please return the questionnaire to Tuija or Matti.

Our work from now on

- **Keeping contact with you.**
 - **Taking a look at your answers.**
 - **Perhaps having another round of chats.**
- **Trying to find the philosophically juiciest topics in synthetic biology.**
 - **Venter disappointment.**
 - **But something like that.**

