

Synthetic Biology and Risk: Is this Really an Ethical Dilema?

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Letter to the Editor

We live in troubled times, when the evolution of biology is following a bewildering pace. If a few years ago we were all surprised by the speed with which the human genome was decoded, nowadays it is more than possible that many of the challenges that even at that point seemed complex to face are within our reach. The most accurate example might come from the field of genetic engineering. Ten years ago, its general application seemed to be quite far from reality. However, it is currently a possibility that is about to come true thanks to the CRISPR/Cas9 technology. Synthetic biology is not an exception to this universal trend. The latest scientific advances, such as the redesign and production of a fully functional chromosome extracted from baker's yeast (*Saccharomyces cerevisiae*) are evidence that we are very close to startling developments in a very near future.

In these circumstances, it is obvious that we need to have a thorough social debate about what we have to do with the possibilities afforded by technology. We will have to discuss, for instance, on the ontological consequences of the fusion between human/non-human materials, or the ethical sustainability of a legal framework based on the intellectual property right concept, as far as it might impede a fair access to these new technologies. However, ethical dilemmas will not include the risk issue. Even if the opposite is often stated, this will not be an ethical debate as because we all agree on the essentials: the need to obtain the best results from a technology without encountering its worst effects. In other words, there is only one ethical rule that actually applies to the dilemma on whether to continue or not with research in synthetic biology: that the risk-benefit ratio is acceptable. But this rule does not raise any ethical debate since we all coincide.

What separates us, however, is what we consider an acceptable risk/benefit proportion. This is really a complex problem, extremely complex, not least because it is not an ethical issue. Ethical issues are amenable to rational discussion. We can develop good reasoning, which permit us to take one position or another. This, of course, does not guarantee final consensus, but it does at least allow us the expectation of achieving them.

The issue with the concept of acceptable risk is different and is not at all susceptible to rational approximation, as it has to do with the assessment we make of the current situation and what a technology such as synthetic biology could obtain. Our most conservative counterparts will always believe that it is better not to take any risk. And yet, there are others that refute this idea stating that no developing technologies such as synthetic biology actually generate an enormous risk, the risk of squandering all the advantages that we could enjoy thanks to her.

Of course, this discussion does not know a definitive answer, at least until the development of synbio provides us with significant data concerning its safety (or unsafety). But this does not mean that it is not possible and necessary to properly study about the real solvency of some risks and benefits that may be much more fictional than they appear to popular imagination. In fact, our second major ethical obligation about synthetic biology is to convey to the public a landscape as objective as possible of the real variables of the issue. On this basis, the public will have to decide what will not be acceptable or unacceptable in ethical terms, but simply more accurate or less. It's all you can really say about the ethics of risk and synthetic biology.