

# Some Considerations on the Paper *ETHICAL PROVOCATIONS IN SYNTHETIC BIOLOGY*, Authored by Olivia Macovei

**Antonio SANDU**<sup>1</sup>

<sup>1</sup> Professor PhD, "Stefan cel Mare"  
University of Suceava, Romania;  
[antonio1907@gmail.com](mailto:antonio1907@gmail.com), ORCID:  
<https://orcid.org/0000-0001-6605-3453>

**Abstract:** The paper presents some considerations regarding the doctoral thesis entitled *Ethical Provocations in Synthetic Biology*, defended by Olivia Macovei under the scientific supervision of PhD. Prof. Viorel Guliciuc, at "Stefan cel Mare" University of Suceava, Romania.

This thesis explores the ethical implications of synthetic biology, a cutting-edge scientific field that raises philosophical questions across ontological, epistemological, anthropological, and ethical domains. The author examines synthetic biology's aim to create new living structures from existing biological components, distinguishing it from artificial biology. The research analyzes the field's impact on various levels, including its ontological implications for life creation, epistemological shift towards pragmatic truth, anthropological considerations regarding posthuman evolution, and ethical concerns about researcher responsibility and technology accessibility. The work contributes to developing a prospective ethics for evaluating emerging technologies, employing an analytical philosophy approach while incorporating hermeneutical elements.

**Keywords:** *Olivia Macovei; synthetic biology; anthropology; ethics perspective.*

**How to cite:** (2024). Some considerations on the paper *ETHICAL PROVOCATIONS IN SYNTHETIC BIOLOGY*, authored by Olivia Macovei. *Postmodern Openings*, 15(1), 90-94. <https://doi.org/10.18662/po15.1/615>



## Introduction

The paper presents some considerations regarding the doctoral thesis entitled *Ethical Provocations in Synthetic Biology*, defended by Olivia Macovei under the scientific supervision of PhD. Prof. Viorel Guliciuc, at “Stefan cel Mare” University of Suceava, Romania.

## Synthetic biology

Synthetic biology represents a field of excellence and cutting-edge scientific and engineering research in the current period, which raises philosophical questions - ontological, epistemological, anthropological, as well as ethical. The emergence of synthetic biology is a relative novelty in the field of scientific-engineering concerns, although older as a theoretical preoccupation, it is tributary to Craig Venter's contribution to creating the first synthetic genome and to creating in the laboratory the first cell with a synthetic genome, alive and viable.

As the author of the thesis correctly distinguishes, synthetic biology aims at the emergence and development of living structures, starting from biological components existing in nature to which various technological processes and procedures are applied, which ultimately lead to the creation of a new living and viable structure, while artificial biology would aim at creating biological components, living structures, starting exclusively from biobricks constituted from non-living components.

Synthetic biology is a science with an important technological component, with wide applications in various fields - from medicine to environmental protection, or biomass production, while artificial biology represents only a technological utopia still at the level of technological project. The author presents several levels of philosophical analysis of synthetic biology issues, as follows:

On the ontological level, the claim of synthetic biology to create life as design is discussed, that is, life forms designed on a computer and then brought to life through genetic editing and manipulation. This characteristic of synthetic biology makes natural evolution to be doubled by a future synthetic evolution, based on a so-called intelligent design, not of divine origin but of human technological origin or even based on Artificial Intelligence (Macovei, 2024: pp. 37-41).

The issue of the creative becoming of the human species is also raised, as co-designer of the environment in which it lives. Nature is thus partially replaced with an artifact. Synthetic species - syn-biotics, as the author calls

them - once created in the laboratory and eventually spread later in nature, within biomedical, food, ecological and de-pollution projects, will be able to lead their existence - partly according to natural laws, partly in accordance with their own genetic code. These could thus become part of the process of natural evolution and could manifest evolutionary advantages, thus displacing similar natural biological structures.

Gradually, through the introduction of these syn-biotic systems, nature will increasingly have the character of a biological artifact, the impact of human design on nature thus becoming undeniable.

From an epistemological point of view, the author captures the specificity of synthetic biology, which instead of focusing epistemologically on truth-correspondence aims at situating itself in a pragmatic form of truth (or post-truth, as the author mentions). A practicing bioengineer of synthetic biology is less interested in obtaining knowledge about the nature of life, knowledge that is rather taken from systemic biology, with which synthetic biology is coupled, and rather in the utilitarian value of the produced technology - hence, the author's reference to the postmodern character of this scientific-technological approach. This character aims at deconstructing the idea of truth-correspondence towards a systemic truth-coherence, as it is valued by Systems Theory and Chaos Theory. We cannot here but welcome the concerns of the distinguished professor Viorel Guliciuc, the coordinator of this thesis and the author's mentor, in the field of frontier sciences philosophy, especially Systems Theory. However, many of the engineers in the field of synthetic bioengineering, including and especially Craig Venter's team, have demonstrated concerns regarding the identification of the origin of life and the transformation of macromolecules into living structures, research that could lead to the development of artificial biology, as discussed at a previous point (Macovei, 2024: pp. 52-56).

The epistemological perspective is subsumed to these two directions: technopessimism and technooptimism. This division is given by the ideological orientation of the respective researchers - including epistemologists - towards new technologies, which are seen as major risks for human existence, respectively as immense benefits in terms of increasing the quality of human life.

From an anthropological point of view, synthetic biology can constitute an opening towards the posthuman, as genetic editing, biological nanobots and mRNA antiviral structures (already existing and used, for example, in the anti-Covid vaccine), once developed, will lead to what I personally defined in a previous work - and which I had the honor to be cited in the author's thesis - as posthuman artificial evolution, or rather posthuman

synthetic evolution, as understood by the author. The removal of humans from the cycle of natural evolution through this technology - and not only through this - represents a desideratum of postmodern science - extremely little understood today and even insufficiently theorized compared to the impact that frontier sciences, of a systemic-constructionist nature, have on society and everyday life. This postmodern science aims at deconstructing objectivity and naturalism - both in the field of social research, through social-constructionist epistemology, and of nature, through understanding the anthropic interference in the natural and the transformation of nature into an artifact.

Synthetic biology thus contributes to the artifactualization of nature, with possible benefits for the human species - which thus controls the environment in which it lives - but also with risks related to the destruction of systems, including living systems of which the human being is a part.

From an ethical point of view, issues such as the responsibility of researchers and bioengineers towards the technologies created and their impact, the accessibility of these technologies, a problem that is correlated with social justice and equity, the impact of these technologies on the autonomy of the individual and/or communities through and towards these technologies are raised.

To remain exclusively in the sphere of utilitarianism and moral calculation, based on which approvals for the development of research projects in the field of synthetic biology were given, or recommendations of the United States Government Ethics Commission (appropriately cited in the author's work) were drawn, can be considered insufficient, a new ethics of technologies - applicable including synthetic technology - being recommended, and this must be a prospective ethics, as it is generally discussed by the ethical school of thought at USV, starting from the works of Professor Sorin Tudor Maxim. The author emphasizes this prospective ethics, bringing a series of contributions in the field, which aim at accepting a technology only after analyzing its transgenerational impact on various ecosystems - including the human one.

From a sociological point of view, the social construction of science in confrontation with new technologies and the social construction of the professional identity of the biotechnologist specializing in synthetic biology are analyzed. The social impact of synthetic biology is also analyzed through the use of specific technologies, such as the technology of creating synthetic mRNA vaccines or genetic editing.

We consider that the work has fully achieved its purpose, namely identifying and discussing the complex philosophical issues related to the

development of synthetic biology, discussions that ultimately lead to outlining directions that could be capitalized on in future works by the author or other contributors in the field, to consolidate a prospective ethics that can be used in the ethical evaluation of emerging technologies and can give indications regarding the moral, epistemological and social acceptability of a technoscience.

From a methodological point of view, the work has a structure tributary to analytical philosophy, even if this analytical methodological approach is not consistently followed in all chapters of the work - an example is that of ethics, where there are broad parentheses of a hermeneutical nature or document analysis.

The author uses the cited bibliography honestly and correctly, even if, as the author herself mentions, there is still a need for monographic studies on the philosophy of synthetic biology, both in Romanian and international philosophical literature.

### **Instead of conclusion**

This comprehensive study on synthetic biology's philosophical implications highlights its far-reaching impact on our understanding of life, scientific truth, human evolution, and ethical responsibility. The research underscores the need for a prospective ethics framework to evaluate emerging technologies, paving the way for future investigations in this rapidly evolving field.

### **Acknowledgement**

Excerpt from the report prepared for the public defense of the doctoral thesis entitled *Ethical Provocations in Synthetic Biology* authored by Olivia Macovei under the scientific supervision of PhD. Prof. Viorel Guliciuc, at "Stefan cel Mare" University of Suceava, Romania.

---

### **References**

---

Macovei, O. (2024). *Ethical Provocations in Synthetic Biology* [Doctoral thesis defended at "Stefan cel Mare" University of Suceava, Romania]