

Governing and Debating an Emerging Science: The Rise of Synthetic Biology in France

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In France, the development of synthetic biology has been slow but steady. Over the past few years we have witnessed: the establishment of a national network of synthetic biologists in 2005, the first participation of a French team at the iGEM competition in 2007, the creation in 2009 of a Master's and an institute dedicated to synthetic and systems biology, an increasing number of conferences and debates, and there are plans to set up platforms for fostering collaborations between public and private actors.

Governing

Yet, the governance of synthetic biology has become an official matter much more recently. The National Research and Innovation Strategy (SNRI) defined synthetic biology as a “priority” challenge in 2009 and created a working group in 2010 with the mission to assess its developments, potentialities and challenges - the report of the group was published in 2011. At the same time, the French Parliamentary Office for the Evaluation of Scientific and Technological Choices (OPECST) has embarked on a review of the field in order “to establish a worldwide state of the art and the position of our country in terms of training, research and technology transfer”. The report, titled *The challenges of synthetic biology* and published in 2012, assesses the main ethical, legal, economic, and social challenges of the field. The report contains several recommendations for a “controlled” and “transparent” development of synthetic biology – not much of a surprise, considering that in France the development of GMOs has often been criticised for being the opposite and that controversies are now to be avoided. Both reports stress the necessity of a “real” and “transparent” dialogue between science and society and call for a “serene”, “peaceful and constructive” public discussion. The strategy is now to **follow 3 steps: to establish an observatory, to create a permanent forum for discussion, and to enlarge the debate to include citizens.**

France's self-perception and goals in synthetic biology are high. We are told about a “new generation of products, industries and markets”, “a substantial jump for biotechnology”, an “industrial revolution”. We read that “France disposes of strong competences” and “all the assets needed”. We see a country that wants to position itself globally, with the US, the UK, Europe, and Germany serving as the main reference points for comparison. France could “aim for a world position of second or third”. Yet many structural and organisational challenges persist: public-private partnerships are rare in France, boundaries between disciplines and academic territories impede interdisciplinary work, synthetic biology is in general included in larger biotechnology programs. And while both the SNRI and the OPECST reports do make recommendations for future developments (i.e. setting up funding policies and platforms), it remains to be seen if these will materialise and when and where investments will be made.

Debating

The Observatory was set up at the French National Conservatory of Arts and Crafts (CNAM), a higher-education institution funded by the French government and dedicated to education and research and the dissemination of scientific and technical culture. The Observatoire was created

at the CNAM for essentially two reasons: The CNAM is seen as a privileged and neutral place, and it already has experience in science–society dialogues through NanoForum. The Observatoire is coordinated by an intentionally pluralistic council that is designed to reflect the different stakeholders and positions of the field. It aims to “be the nodal point for the circulation of information, reflections, discussions about synthetic biology” and to be a “place of experimentation... for a science–society dialogue”. Its roles are to collect information, to mobilize actors, to follow debates, to analyze the various positions, to reflect...

The Observatoire launched a Forum of Synthetic Biology, conceived as a “*space of open and pluralistic debate to permit the exchange of information, the sharing of knowledge and the expression of disagreements about the multiple challenges of this emerging domain*” in order to favour an “*enlightened and constructive discussion*”. But during the first forum, held in april 2013, nothing went as planned. A few minutes into the debate, it is interrupted by some 15 persons wearing monkey masks (a group of protesters called PMO).

These debates are not only a place for raising critiques regarding the socio-economic and political aspects of synthetic biology. To understand the different critiques made by the actors who intervene in the debates on the form of the debate itself, the distinction between “divisible” and “indivisible” conflicts is useful (see Hirschman, Barthe, Meyer). On the one hand, the Observatory and the Forum consider themselves as spaces of dialogue and debate where people can deliberate and negotiate. Meant to anticipate conflicts, these spaces of negotiation can nonetheless lead to a proliferation of conflicts – on the substance and the form. On the other extreme, there is PMO, an “indivisible” actor who does not want to negotiate nor discuss: “*We have no question to ask you, no uncertainty to lift. Our position is already fixed: we do not accept*” (pamphlet). The criticisms made by PMO can be qualified as radical and “total”, since they condemn the practices, objectives, products, institutions, debates (considered as “*pseudo-forum*”, “*hollow debate*”, “*masquerade*”) and sociologists involved (qualified as “*sociologists of acceptability*”). Between these two positions, there are actors who negotiate while formulating critiques – actors we might call “inversible”: the *Fondation des Sciences Citoyennes* who is involved in the Forum and the Observatory, but who defines its collaboration as a “*vigilant, critical and non unconditional participation*”; *VivAgora* who has criticised the “*analytically and academically overhanging posture*” of the Observatory and stressed that “*discords*” need to be taken into account. Such an analysis of actors’ criticisms and positioning forces us to problematize terms like debate and participation and renders these terms *divisible* too.

Problematizing

In Foucauldian terms, apart from the construction of synthetic biology as an *object*, we also see the making of synthetic biology as a *problem* and a set of questions. Although we observe efforts to assemble synthetic biology as an (inter)discipline within scientific institutions, we also see efforts to converse, observe, and reflect about the practices and objects of synthetic biology—in other words, to *problematize* synthetic biology. The ways in which all of these objectifications, politicizations, problematizations, and publicizations of synthetic biology interact with, influence, and coproduce one another are a fruitful topic for analyses.

An idea developed by biologist Antoine Danchin can help us further theorize these kinds of interactions. Danchin coined the concept of symplectic biology, a kind of biology that weaves

together objects and disciplines. In his words, “under this scheme, the roadmap to engineering biological systems is determined not by the biological parts but rather by how they interact... The relationships between the objects—and not necessarily the objects themselves—are crucial to any attempt to construct a synthetic cell with nonnatural properties”. Such a “symplectic” vision—which we might also call relational or integrative—can be productive for thinking about synthetic biology. Besides referring to relations between objects, the notion could be generalized and broadened to include the politics and the publics concerned with those objects. This could, then, serve as a potent reminder that synthetic biology should not and cannot be discussed in isolation. On the contrary, synthetic biology needs to be conceived in an integrated way, as an assemblage of scientific objects, policies, problems, and publics. As much as natural scientists should not reduce their vision of synthetic biology to objects alone, social scientists should not reduce their analysis to categories such as *social*, *legal*, or *ethical* as if the socioeconomic, political, and moral dimensions of synthetic biology could be broken down into such neat parts. What social scientists can offer, instead, are relational accounts on how the history, governance, geopolitics, and debates of synthetic biology are woven together and why synthetic life needs to be discussed together with social life.

This text has been compiled based on the following publications: Meyer, M. (2013) ‘Assembling, Governing, and Debating an Emerging Science: The Rise of Synthetic Biology in France’ in *BioScience*, Vol. 63, No. 5, pp. 373-379; Meyer, M.(2013) ‘Aiming high, but investing little’ in *EMBO reports*, Vol. 14, No. 1, p. 2; Meyer, M. (2013) ‘Debating synthetic biology: a necessity or a masquerade?’ in *Carnet de Recherche du CSI*, Juillet 2013