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# Mutual Learning in Synthetic Biology: POLICY IMPLICATIONS OF RRI

Exchange on Experiences and Perspectives from the SYNENERGENE Project

April 24<sup>th</sup> – 25<sup>th</sup> 2017, Brussels

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## Summary

The workshop aimed to present lessons learned in the SYNENERGENE project and discuss their relevance to EC policies concerning responsible research and innovation (RRI), synthetic biology and the bioeconomy with EC staff members, stakeholders and SYNENERGENE partners. Salient findings from the workshop are:

- **Risk research of synbio is increasingly lagging behind innovation.** One cause is the reduced investment in risk assessment as a percentage of the budget for research in H2020 compared to earlier FPs. Another issue is the lack of tools for doing quantitative risk assessment. Thirdly, a narrow definition of risk is not a fruitful way to address underlying value conflicts.
- **Several proposals were made to improve the handling of risks.** These range from efforts to make risk research more attractive, via risk-benefit assessment and risk governance to social experiments and stakeholder dialogue on values. The need for investing in experiments to gain experience was stressed.
- **There is a need for RRI tools for scientists, business and NGOs.** Several means have already been developed and tested. The SYNENERGENE project itself is a platform for broad dialogue and mutual learning among all stakeholders. Other tools focus on capacity building for one or more stakeholders. For instance, in SYNENERGENE an online toolbox for real-time Technology Assessment (TA) and virtual prototyping, the 'iGEMer's Guide to the Future' has been developed for and with iGEM teams. A 'foundry' for social innovation in the bioeconomy could support the development of RRI in business. The PRISMA project<sup>1</sup> is a move in that direction. The SYNENERGENE Media forum developed a 'media doctor'. This is a tool to help in reporting claims, taking away hype, speculation and over-claims. A third type of tools raises awareness and fosters debate. E.g. Woodrow Wilson and a group of CSOs have

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<sup>1</sup> <http://www.rri-prisma.eu/>



developed databases with synbio products, to raise public awareness. This has sparked controversy over the selection of cases and the impacts on the companies. Another type of tools helps shape the agenda for debate (e.g. UK Forum for the Future)<sup>2</sup>. In addition to such development of tools, regulators need tools to check if innovation is responsible. These should include quantitative risk-benefit and risk governance tools as well as tools fostering dialogue on values.

- **Biosecurity issues include finding the appropriate level for oversight** (national, international, US-based). The lack of functional oversight has inspired gene synthesis companies to develop codes of conduct (involving screening procedures for synthesised genes as well as customers) and raise awareness in the sector. Opinions differed whether defence (funded) research or DIY biologists created bigger biosecurity risks.
- **Open spaces should be created for deliberation of cultural and religious values** (rather than opinions). A core value is **humility**, this is shared by religious and non-religious environmentalists alike. Other values are healing and perfecting the world, and naturalness. Theologians have spent thousands of years reflecting on values and developing religious traditions, which can teach us. Values also determine how citizens and stakeholders balance benefits and risks of synbio and emerging technologies. These values can be influenced by technological progress.
- **Industry and civil society actors may share common values, but the discussion tends to keep focused on the different approaches to tackling grand challenges (technical versus social innovation). What could be done to overcome entrenched conflicts and wicked problems?** At a philosophical level, the distinction between Habermasian deliberations in an 'Agora' ('gathering space') and Foucauldian discourse in an 'Arena' offers an analytical tool to gain insight in the dynamics of an actual discussion. One practical suggestion to bridge the gaps is to focus discussion on shared aims versus contested means. In SYNENERGENE, trading zones were organised in Europe and the USA for honest discussion on whether research agendas reflect our values, e.g. involving DIY biologists and academics. Another good practice is in local experiments where citizens shape technology with their own values such as in in DIY Bio. Embedding exploration of synbio solutions into future scenarios for organising antibiotics stewardship by the Rathenau Institute is a third example. At the EU and international level, strengthening the link between industrial wealth creation and tackling grand societal challenges could be a way forward.
- **Governance for innovation and innovation in governance are required.** A move from risk governance to innovation governance was suggested. This move may require institutional change, in addition to new tools for regulators, as well as the development of open public-private partnerships into public-private-societal partnerships.
- The role of **social media** in the public debate on synbio is increasingly important, but some stakeholders (such as companies) are unsure how to respond adequately. Social media and opinion polls are problematic instruments for fostering dialogue on RRI (since underlying

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<sup>2</sup> <https://www.forumforthefuture.org/>



values often remain unrevealed). Open dialogue with citizens (e.g., in focus groups) appear more suitable.

- **When it comes to ways forward to RRI in synbio, both holistic and focused approaches were proposed.** A broadening of the scope to converging technologies (Bio, Info, Nano, Cogno) was opposed to focusing on specific impacts caused by synbio. Similarly, taking into account impacts of synbio on natural capital and the UN Sustainable Development Goals (SDGs), or peace, was proposed, and contrasted to focusing on specific risks and benefits of product and technology for selected stakeholders (e.g. farmers, rare species). Furthermore, there were calls for dialogue on underlying broken relationships, for example linked to notions on the role of economics, technology and nature, while others suggested to explore novel tools for risk assessment and risk governance of synbio.
- At EU level, **the discussion on innovation<sup>3</sup> versus the precautionary principle** has been sparked by a recent strategic note of the EPSC, an advisory body to the European Commission. This note may reveal an underlying value conflict between neoliberal and technocratic worldviews on the one hand, and worldviews oriented towards holistic approaches and sustainability on the other. It is part of the Better Regulation agenda of the EC, which may be interpreted as fostering less regulation, but also as stimulating innovation through (environmental) regulation.
- **Contributions of insights from SYNENERGENE to negotiations on the Convention on Biodiversity, the UN Technology Facilitation Mechanism and other international treaties are welcome.** While policy makers, industry and civil society organisations are participating, engagement of scientists and experts appears to be less pronounced. The formal and slow-paced dynamics of policy making and the fast, creative progress in science are difficult to reconcile.
- **Planning of H2020/FP9 work programmes is ongoing. Documents highlighting SYNENERGENE results and insights are welcome,** and will be taken into account by the EC staff members involved.

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<sup>3</sup> [http://ec.europa.eu/epsc/publications/strategic-notes/opportunity-now-europe%E2%80%99s-mission-innovate\\_en](http://ec.europa.eu/epsc/publications/strategic-notes/opportunity-now-europe%E2%80%99s-mission-innovate_en)



## Annex : workshop agenda and participants

Synthetic biology (SynBio) and the recent CRISPR/Cas genome-editing technology in particular have raised new challenges for regulation and governance in an international context. Potential applications will have impacts beyond national borders or even globally. Moreover, bioscience is increasingly globalised, including distributed open-source networks and crowdfunding initiatives. Responsible governance may thus have to become even more inclusive and international, by further developing meaningful democratic deliberation processes and avenues to “Responsible Research and Innovation” (RRI) and its coupling to policies – in close cooperation with scientists, industrialists, civil society actors and other citizens. The SYNENERGENE project has facilitated dialogue and interactions on a variety of aspects of RRI in SynBio exploring such avenues capable of taking into account a broad range of ethical and social issues, while not missing out opportunities from this emerging field.

The forthcoming SYNENERGENE event “Mutual Learning in Synthetic Biology: Policy Implications of RRI” will present lessons learned by SYNENERGENE partners and other stakeholders related to challenges such as biosafety and biosecurity, design approaches sensitive to cultural values, the bioeconomy, distributed open-source networks and transnational governance challenges. A key lesson learned in SYNENERGENE is the need for creating mutual trust between a wide variety of stakeholders in highly controversial areas of research and technology development (in which public and stakeholder discussions often tend to be rather “toxic”). In this regard, ‘soft governance’ measures and the facilitation of inclusive dialogue by means of innovative formats have proven to be useful. In this workshop, we aim to discuss the SYNENERGENE experience with representatives of the European Commission, other policy experts, stakeholders and project partners.

The exchange of information and perspectives shall allow to identify major policy implications of RRI experiences in SynBio and beyond, with a particular view to the EU level.

### AGENDA

#### Monday, April 24<sup>th</sup>

**Venue:** Helmholtz Office in Brussels, Rue du Trône 98, 1050 Brussels, Belgium

12:00 - 12:30 Registration and welcome snacks

12:30 – 12:45 Welcome and introduction

#### *Biosafety and biosecurity: Governance options and challenges*

12:45 - 13:30 Adaptive risk assessment and real-time technology assessment

13:30 - 14:15 The case of biosecurity and the role of cultural and religious values



14:15 - 14:30 Coffee break

*The politics and policies of emerging bioscience and -technology*

14:30 - 15:15 Common values, different approaches: Controversies on RRI in SynBio

15:15 - 16:00 New and emerging governance challenges in bioscience and -technology

16:00 - 16:15 Coffee break

16:15 - 16:45 Representative of DG Research and Innovation RTD-B7 'Science with and for Society'

16:45 - 17:30 Final discussion round and concluding remarks

19:00 Workshop networking dinner

Dinner Venue: "L'Esprit de Sel Brasserie", Place Jourdan 52-54, 1040 Brussels

## **Tuesday, April 25<sup>th</sup>**

**Venue:** Representation of North Rhine-Westphalia to the European Union, Rue Montoyer  
47, 1000 Brussels, Belgium

08:45 - 09:00 Registration

09:00 - 09:45 Statements on SynBio-related policy priorities by EC representatives

09:45 - 10:15 Wrap-up results of Day 1 (including stakeholder comments)

10:15 - 10:30 Coffee break

10:30 - 11:30 Panel Discussion: EC representatives, SYNENERGENE Open Forum chairs and others

11:30 - 12:15 Final plenary discussion

12:15 - 12:30 Closing remarks

12:30 Lunch and farewell



<b>Institution</b>	<b>Name</b>	<b>First Name</b>
<b>KIT</b>	Coenen	Christopher
<b>KIT</b>	Koenig	Harald
<b>Greenpeace European Unit</b>	Achterberg	Franziska
<b>European Commission</b>	Arnold	Thomas
<b>European Commission</b>	De Vicente Coll	Carmen
<b>LIS Consult</b>	de Vriend	Huib
<b>European Commission</b>	Galiay	Philippe
<b>EMBO</b>	Garfinkel	Michele
<b>Evolva</b>	Heim	Jutta
<b>CEO</b>	Holland	Nina
<b>FZ Jülich</b>	Kremser	Annette
<b>King's College London</b>	Lentzos	Filippa
<b>US Army Corps of Engineers</b>	Linkov	Igor
<b>ThermoFisher</b>	Liss	Michael
<b>Fond. pour la Recherche sur la Biodiversité</b>	Livoreil	Barbara
<b>Malsch TechnoValuation</b>	Malsch	Ineke
<b>COGEM</b>	Mampuys	Ruth
<b>SDU</b>	Rasmussen	Steen
<b>Rathenau Instituut</b>	Robaey	Zoe
<b>European Commission</b>	Scarafino	Antonio
<b>Rathenau Instituut</b>	Stemerding	Dirk
<b>European Commission</b>	Teller	Anne
<b>ETC Group</b>	Thomas	Jim
<b>European Commission</b>	Triepi	Chiara
<b>NL Council of Churches</b>	van de Streek	Hillie
<b>RIVM</b>	Westra	Jaco