Deliverable 2.1

Activity Catalogue for Measures in Public Dialogue

Work Package 2: Governance and Society

Austrian Research Promotion Agency (FFG)

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Contents

Introduction

In recent decades, we have seen a rise in the demand for more public engagement and dialogue in most fields and at all levels. The realm of science and technology has not been untouched by this trend. Research funds, scientists, policy makers, and various stakeholders alike have recognized the potential of engaging the public and creating opportunities for mutual exchange between science and society (Bauer and Jensen, 2011). While in some cases, scientific developments and the expectations of possible uses may have been exaggerated and therefore need to be assessed critically, that same critical approach seems to be warranted with regard to developments in public engagement and dialogue. Nevertheless, it appears that a broad agreement exists among researchers identifying a significant change or "turn" with respect to the relationship between research and society, the development being inter alia referred to as the "dialogic turn" (Davies, 2013), "democratic turn" (Mejlgaard and Stares, 2010), or "participatory turn" (Braun and Schultz, 2010). All manner of publics are invited to debate in different settings, and there are almost no limits to the creativity expressed in public engagement strategies. As a result, a great variety of methods and methodologies have developed across countries and disciplines (Bauer and Jensen, 2011, Kouper, 2010, Kurath and Gisler, 2009, Meyer, 2013, Rowe and Frewer, 2005, Tatalovic, 2009).

Synthetic Biology is one of the fields where public engagement plays a crucial role in communicating science to the public in a one-way dialogue. Equally importantly, it asks the public for its views, opinions, and attitudes and allows the public to deliberate about the opportunities and challenges of novel technologies and products, in order to assemble something of a "public ethics" (Nuffield Council on Bioethics, 2012) that informs scientists and policy makers, and finally influences science itself. A wide range of reports from national and international public institutions investigate and offer recommendations on how public dialogue on Synthetic Biology can best be implemented, and especially how the dialogue can be implemented so that input from the larger citizenry effect regulatory bodies and research funding. The central claim is that public dialogue activities do not end up as merely compulsory tasks to be fulfilled, but that they have real impacts on future policies (acatech - National Academy of Science and Engineering, 2012, Nuffield Council on Bioethics, 2012, OECD Royal Society, 2010, Presidential Commission for the Study of Bioethical Issues, 2010, The European Group on Ethics, 2009, The Royal Academy of Engineering, 2009).

Description of Deliverable 2.1 – Activity Catalogue for Measures in Public Dialogue

The "Activity Catalogue for Measures in Public Dialogue" offers a new contribution to the mapping of efficient models of public engagement according to the central aims of the ERASynBio work package 2 on "Governance and Society" (henceforth WP2).

The central aim of WP2 is to develop a solid societal dialogue in order to identify possible (and prospective) public misconceptions by addressing the implications of Synthetic Biology and related societal challenges. WP2 constantly traces and integrates ethical, legal, economic, and societal considerations relevant for Synthetic Biology, and supports the integration of social sciences in

Synthetic Biology research.[1] Part of the work of WP2 is the elaboration of Deliverable 2.1, which consists in the formulation of an "Activity Catalogue for Measures in Public Dialogue." This task will support the development of close interactions and exchange between social scientists and policy makers, industry, the public, the media, and other relevant stakeholders, such as NGOs and CSOs[2], by presenting suggestions for public engagement.
The activity catalogue has two main sections. First, it presents the central conclusions and recommendations of the ERASynBio "Workshop on Public Dialogue and Governance of Synthetic Biology," which was held in Vienna on March 14–15, 2013. This workshop was an expert meeting organized by the Austrian Research Promotion Agency (FFG), in its function as leader of WP2, with the central aim of considering aspects of public engagement, science and society dialogue, practices of good governance, and the integration of social science perspectives and ethical issues.[3]

Second, this document presents examples of past and current initiatives and activities on public engagement in the field of Synthetic Biology.

The "Activity Catalogue for Measures in Public Dialogue" provides the consortium, researchers, policy makers, and other relevant stakeholders with efficient measures for public dialogue.

Recommendations from the ERASynBio Expert Meeting in Vienna

The ERASynBio "Workshop on Public Dialogue and Governance of Synthetic Biology" held in Vienna on March 14–15, 2013, focused on societal, ethical, and regulatory issues in the context of Synthetic Biology in Europe. The experts attending the workshop[4] worked in particular on aspects of public engagement and on the integration of social science perspectives in future transnational funding activities that will emerge within the ERA-NET project "ERASynBio."

In the workshop, recommendations were detailed that are addressed to researchers, European funding agencies, policy makers and other relevant stakeholders, and will also be integrated into a White Paper that will be elaborated in this ERA-NET. The recommendations should serve as guidelines for efficient models and measures in public dialogue about synthetic biology and shall encourage funders and policy makers to work towards more upstream governance foresight forms.

The conclusions and recommendations presented in the following sections are the distilled outcomes of two days of plenary discussions and of discussions within smaller working groups in breakout sessions. They summarize statements made by workshop participants and do not represent the personal opinions of the authors of this document. In the following, the recommendations are not attributed to individual participants, but represent the agreements of the group as a whole.

[1] http://www.erasynbio.eu/index.php?index=33
[2] Civil service organization
[3] The ERASynBio "Workshop on Public Dialogue and Governance of Synthetic Biology" took place in the BMWF function rooms, Palais Harrach, Freyung, Stairs 3/2nd floor, 1010 Vienna (Austria).
[4] A list of the ERASynBio workshop participants, affiliations, and contacts appears in the final section of this report (Annex).

General considerations

Participative approaches should be implemented at **all levels** dealing with the planning, implementing, dissemination and use of synthetic biology research.

In discussions of public dialogue, the meaning of the notion of "dialogue" should be reflected. Because "dialogue" implies a two-way action, it is not sufficient to merely inform the public; rather it is necessary to give the public the opportunity to influence the funding and regulation of Synthetic Biology. An influential public dialogue is achieved when its outcomes influence the science itself: the way the science is conducted, research structures, policy makers, and in some way may even influence the trajectory of the science itself.

Public dialogue activities should be characterized by ***transparency***, ***accountability***, and ***participation*** as guiding principles. These three principles should also be the core of good governance in Synthetic Biology.

These principles have been suggested as a model to improve governance of public funds, combat corruption and regulation the financial system (see e.g. the open government standards initiative[5], the report of the Swedish agency for international development[6], and the International Regulatory Reform Conference IRRC[7]). Moreover, they are mentioned in the report of the European commission on responsible research and innovation[8] as well as in the report of the US presidential commission for the study of bioethics[9]. While considered for issues of governance in the area of public budgets, development aid, and financial institutions, and as part of a number of principles for governance of synthetic biology, it was felt that these three principles could be a focus point of good governance in synthetic biology.

These principles should be weighed and balanced against each other. For instance, transparency may not mean making everything available to the public, as some research results might be detrimental to public safety (see e.g., the H5N1 mutation controversy[10]). In some instances, it may therefore be preferable to withhold research results. However, transparency may mean that the fact of research being carried out is made available to the public and the reasons for withholding certain results be stated.

[5] http://www.opengovstandards.org
[6] "Getting it together Strengthening transparency, accountability, participation and non-discrimination with communication methods" by the Swedish Agency for international development SIDA, (http://www.oecd.org/dev/devcom/47182861.pdf)
[7] Regulatory Reform Conference (IRRC), Berlin, 2013 (http://www.oecd.org/gov/regulatory-policy/irrc.htm)
[8] Options for Strengthening Responsible Research and Innovation, Report of the Expert Group on the State of Art in Europe (doi: 10.2777/46253, 2013)
[9] NEW DIRECTIONS - The Ethics of Synthetic Biology and Emerging Technologies, (2010), Presidential Commission for the Study of Bioethical Issues, Washington
[10] "Contagion: Controversy Erupts over Man-Made Pandemic Avian Flu Virus" (2011) http://www.scientificamerican.com/article.cfm?id=contagion-controversy-erupts

Recommendation 1

The need for participative approaches should be implemented on the level of respective calls as well as in the selection procedures of the projects. Public dialogue on Synthetic Biology is as essential as the research itself.

Recommendation 2

Be aware that people may misunderstand public dialogue activities as propaganda for Synthetic Biology. Public dialogue should be more than a one-way communication. It should not be some sort of publicity that makes people like Synthetic Biology. Instead, it should offer them space to first learn more about this new technology, its challenges and opportunities, and second to reflect on it, by bringing their opinions, ideas, and concerns to the fore.

Recommendation 3

The public should be given the opportunity to influence the funding and regulation of Synthetic Biology. An influential public dialogue is achieved when its outcomes influence the science itself: the way the science is conducted, research structures, and policy makers.

Recommendation 4

Public dialogue should include the participation of a wide range of stakeholders, who might be lay citizens, scientists, representatives of industry, policy makers, advisory board members of science fund councils, etc.

Recommendation 5

Rather than talking about “The” public as a homogeneous block, one should reflect about the idea of publics (plural). In particular, for the ERA-NET there should be real dialogue between those engaged in Synthetic Biology research (experts, scientists, funders, etc.) and those publics that have a genuine stake in Synthetic Biology at this stage (e.g., patient groups), and not necessarily the “general” public.

Recommendation 6

Integrate scientists from the field into dialogue activities, so they can explain why they do research in this field and why their research is important. Talk also about the unknowns and risks of Synthetic Biology that scientists themselves are not able to foresee. All communication should be honest and transparent, and researchers could be encouraged to talk about their own concerns and fears.

Recommendation 7

A clear definition of Synthetic Biology and a demarcation from classical genetic engineering could be useful. Reports from the National Academy of Science and Engineering (acatech - National Academy of Science and Engineering, 2012) or from the European Group on Ethics (The European Group on Ethics, 2009) could serve here as points of reference when trying to elaborate a clear definition of Synthetic Biology. If such a definition cannot be provided because scientists themselves have no clear definition for this novel field of research, this should also be communicated to the public.

Recommendation 8

Open research to society, for example, by inviting lay citizens to visit laboratories where research in Synthetic Biology is done. Let them see something of the daily work and routines in a science laboratory in order to make this novel kind of research more tangible and also to show that scientists are ordinary people and not abstract figures.

Recommendation 9

Begin public dialogue activities at an early stage and continue promoting it in training at all levels – from schools to post-doctoral programs. Information and dialogue should be fostered proactively in order to avoid that people just take up what they hear from sensationalist media. Further, the combination of disciplines such as biology, engineering, physics, chemistry and informatics should be promoted in education already at an early stage.

Recommendation 10

Use online platforms as forums for exchange. On the one hand, web 2.0 tools could serve as media for making information available to the broad public – and by that means also meet transparency requirements – , and on the other hand offer a forum for comments.

Recommendation 11

Past examples of successful public engagement activities could be a source of inspiration for future activities. For example, the UK Synthetic Biology Dialogue (BBSRC, 2010) could be a point of reference. Further, the considerable range and volume of available official documents can be considered in addition to the recommendations made at the Vienna workshop (e.g. acatech - National Academy of Science and Engineering, 2012, Nuffield Council on Bioethics, 2012, OECD Royal Society, 2010, Presidential Commission for the Study of Bioethical Issues, 2010, The European Group on Ethics, 2009, The Royal Academy of Engineering, 2009).

Recommendation 12

Don’t be afraid of alternative and creative forms of public dialogue! Devise public dialogue activities that are bold! Nobody will listen to you if you merely repeat the same kinds of messages that everybody already knows.

Examples of Past and Current Public Engagement Activities on Synthetic Biology

In order to provide guidance on how these recommendations could be put into practice, in the following section examples of past and current public engagement activities on Synthetic Biology are presented.

iGEM

iGEM stands for International Genetically Engineered Machine. The iGEM Competition is an annual event for students interested in working with Synthetic Biology. The competition began in 2003 with a month-long course at the Massachusetts Institute of Technology, where students were invited to

design and work in teams on new biological parts and systems. iGEM is intended to foster scientific research and education by bringing together students and practitioners in laboratories, universities, high schools, research institutes, industry, and the public. Throughout the summer, student teams work together in laboratories at their home universities to design and build new biological systems on the basis of a kit of genetic parts or "biobricks" that they receive from the "Registry of Standard Biological Parts."[11] Each autumn, the best projects are presented at the annual iGEM Competition at MIT in Boston.[12]

Science & Theatre – "Designer ~~Jeans~~ Genes"

The English Theatre Berlin, in cooperation with the Department of Microbiology at the Freie Universität Berlin, set up the interdisciplinary project "Science & Theatre." In this project, the ethical and social aspects of the natural sciences are the subject of discussion at the interface between the arts and science. Actors, students, and scientists explore together the questions that arise from new scientific developments, using the medium of the theater as a new avenue for science communication and public dialogue.[13] Between October 2011 and February 2012, "Science & Theatre" and students from three Berlin high schools (Heinrich-Schliemann-Gymnasium, Humboldt-Gymnasium, and Leibniz-Schule) set up the project "Designer ~~Jeans~~ Genes." The project consisted of a series of performances and an exhibition exploring Synthetic Biology and bringing in different ethical viewpoints.[14]

BIO:FICTION – Synthetic Biology Science, Art and Film Festival

BIO:FICTION was a science film festival organized by a scientist and an artist (then IDC, now Biofaction), bringing together scientists, researchers, artists, and the public at the Museum of Natural History in Vienna in 2011. It was intended to foster dialogue and to provide the public with information about Synthetic Biology by using entertaining and unconventional ways of communicating science. In addition to films, there were science talks, panel discussions, and an art exhibition, all of which were open to the general public. Following its great success in Vienna, BIO:FICTION went on tour around the world, with festivals in Mannheim, Karlsruhe, Adelaide, and Hong Kong.[15]

Vienna Open Lab

The Vienna Open Lab offers people aged 6 to 99 the opportunity to gain insight into the fields of biotechnology, genetics, and genetic engineering. Its central goal is to make the life sciences more accessible to lay people by bringing people into a working laboratory and giving them the opportunity to carry out their own experiments. Interested persons can select among a variety of workshops, wherein trained experts give insights into their everyday experimental work and discuss various aspects with workshop participants. There are also special workshops for school classes, but in general the workshops address all age groups. Families, companies, schools, and associations alike

[11] http://partsregistry.org/Main_Page
[12] http://igem.org/About
[13] http://www.bcp.fu-berlin.de/en/biologie/arbeitsgruppen/mikrobiologie/ag_hengge/Science_and_Theatre/index.html
[14] http://www.etberlin.de/program-mainmenu-32/357-2011-12-29-12-50-17
[15] http://bio-fiction.com/en/

visit the Vienna Open Lab, which is on the Vienna Biocenter Campus in the midst of several research institutions.[16]

Obsérvatoire de la biologie de synthèse

Set up in 2012 at the French National Conservatory of Arts and Crafts in Paris, the "Obsérvatoire" is intended to be an experimental place where science and society enter into a dialogue that critically reflects the goals of research in Synthetic Biology. Open to all sorts of publics, it understands itself as a nodal point for the circulation of information and discussion about the definition, the uncertainties, challenges, and opportunities of Synthetic Biology. The "Obsérvatoire" was created as a response to the French Ministry of Education, which proposed that developments in the life sciences be accompanied by a dialogue with all kinds of stakeholders.[17]

The UK Synthetic Biology Dialogue

The Synthetic Biology Dialogue[18] that took place in 2009/2010 in the UK can be seen as an example of good practice for engaging a broad variety of publics and bringing them together with specialists from science, industry, and governance. Initiated by the Biotechnology and Biological Sciences Research Council (BBSRC) and the Engineering and Physical Sciences Research Council (ESPRC), supported by the Department for Business, Innovation and Skills' Sciencewise program, and carried out by the TNS BMRB, this public engagement strategy consisted in organizing Citizen Panels, a particular kind of workshop with members of the public who enter into dialogue with stakeholders and specialists from the field. These workshops were held in London, North Wales, Newcastle, and Edinburgh, and the participants met in three workshops that lasted a total of 2,5 days. Workshop participants were invited to articulate their views and to discuss them within the group. Altogether 160 members of the public were involved, and in addition 41 interviews with stakeholders were conducted (BBSRC, 2010).

Synthetic Biology in the Science Café

Between 2009 and 2011, a group of scientists organized Science Cafés in five Canadian cities. The Science Café is a concept dating back to the 19th century, when people met in bars or cafés to discuss philosophical or everyday issues. Building on this idea, participants were invited to gather with others in a bar or café to discuss and listen to experts who spoke for 15-20 minutes. Each Science Café on Synthetic Biology lasted approximately 90 minutes, with the number of participants ranging between 27 and 150. It is reported that many participants remained after the event officially ended in order to continue the discussion. The speakers had scientific, social scientific and bioethical/legal backgrounds, and each presentation was followed by a question-answer period. After each Science Café, participants filled out surveys, which allowed recurring themes and questions on Synthetic Biology to be gathered (Navid and Einsiedel, 2012).

[16] http://www.viennaopenlab.at/index.php
[17] http://biologie-synthese.cnam.fr/historique/
[18] http://www.bbsrc.ac.uk/society/dialogue/activities/synthetic-biology

Citizen Panels in Austria

During November – December 2012, the Life Science Governance Institute (LSGI), in cooperation with the FFG, organized a number of Citizen Panels (CPs) in Austria as an empirical part of the work on public dialogue in WP2. These workshops with the public were composed of 6–12 people and lasted 2-3 hours. Different kinds of publics were invited to discussion in an open environment. Participants were chosen for a diversity of social, educational, cultural and political backgrounds and were separated into two age groups: adults aged 18-49 and adults aged 50+. A total of 8 CPs with lay publics in Vienna and in Innsbruck were conducted, 4 in each city. Each city had two groups with each of the two age groups, with the oldest participant 78 years old. Based on these sampling criteria, a multifaceted and critical debate was initiated and very diverse points of view were brought up during the workshops.

All CPs were led by two trained moderators, who followed an elaborated topic guide with predefined open questions. This topic guide was developed according to the goals and objectives of WP2. The aim was to facilitate dialogue among citizens in order to know their perceptions, attitudes, and feelings toward Synthetic Biology. The CPs were divided into two altering phases: (1) *Information phases*, where participants were provided with neutral information about objectives, strategies, and fields of application of Synthetic Biology; and (2) *Discussion phases*, where participants were invited to express their opinions on Synthetic Biology and to discuss challenges and opportunities. Materials such as flipcharts, questionnaires, images, and sticky notes were used. With this strategy, it was possible to gain insights on not only *what* people think about Synthetic Biology and its application in different fields, but also *how* and *why* they think that way. Social, ethical, legal, and economic considerations about the (re-)construction of new biological parts, objects, and living organisms were discussed deeply in the CPs.[19]

All discussions within the CPs were audio-recorded and then transcribed. The transcripts were reviewed, and statements with similar content were grouped and compared with issues and questions raised within the other CPs. This process was followed by an overall comparison of the discourses within all 8 CPs in order to develop an in-depth picture and knowledge of people's perceptions and opinions, of their expectations, hopes, concerns, and fears connected to the emergence of the new and promising field of Synthetic Biology.

Further ideas for public engagement activities

Additional ideas for public engagement activities are available online at:

- http://www.partizipation.at/methods.html
- http://participationcompass.org/article/index/method

These websites offer toolkits with more than 40 methods for public dialogue activities, separated according to individual demands and projects for small, medium-sized, or larger groups.

[19] The Citizen Panels conducted in Austria in November/December 2012 are similar to those conducted by BBSRC in 2009/2010 (see above), especially in regard of the issues and questions that were discussed within the CPs: http://www.bbsrc.ac.uk/society/dialogue/activities/synthetic-biology.

What should precede the decision to use any specific tool is the knowledge of the objectives of the public engagement and also of the way how public engagement will be evaluated**.** According to the Nuffield Council on Bioethics, dialogue falls into two main types: one-way dialogue or two-way dialogue. Before selecting a method, it is essential to have a prior accord if you plan to do conventional science communication activities, which have an information flow in one direction – from scientists to the public (e.g., social surveys, forms of opinion research, open-labs, information campaigns) – or if you seek to achieve deliberation and dialogue between different participants through two-way communication formats. Further, you should be clear about whether you need a method to reach consensus or recommendations for action, or if your main goal is to collect a large variety of perspectives (Nuffield Council on Bioethics, 2012: 84-85).

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Annex: List of Participants at the ERASynBio "Workshop on Public Dialogue and Governance of Synthetic Biology" in Vienna, March 14-15, 2013

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