

How to attract prestigious researchers for science foresight?

ESF-Workshop

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Main challenges for science foresight in Europe

- to **identify “leading scientists” on a merit-base** - like the Highly cited Scientists of ISI – to form a ‘European Science Faculty’
- to **watch** coordinated and permanently **the evolution of established and upcoming scientific fields** and **the performance of scientific experts** (horizon scanning)
- To **define transformational topics and themes for pan-European science foresight exercises**
 - *driven to radically changing our understanding of an important existing scientific concept, or*
 - *leading to the creation of a new paradigm or field of science, or*
 - *challenging our current understanding or its pathway to new frontiers*
- To **organize the process of science foresight studies** and to publish the results in an appropriate open manner (web 2.0)

Today`s landscape of science foresight in Europe

A concert of many different „voices“

Ex ante

- Different size, profundity and quality of reports
- Different moment of publication
- Different level of participation of leading scientists

Ex post

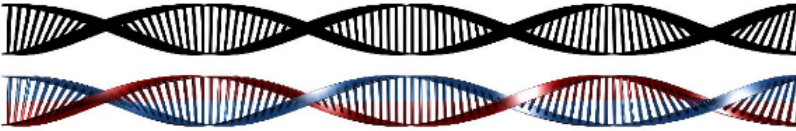
- Different impact of science foresight studies

Example: **Synthetic biology**

Synthetic Biology: 27 reports on the ALLEA website

Home > Activities > Standing Committee Science & Eth... > Print

Emerging issues; Synthetic Biology and other fields



Advice work of European Academies on Synthetic Biology

Germany

- Acatech/DFG/Leopoldina report: Synthetische Biologie - Stellungnahme (2009)
- Programme Ethic Forum, Synthetische Biologie: Auf dem Weg zum künstlichen Leben? (2011)

Switzerland

- Swiss Academy of Technological Sciences, Publication Synthetic biology Emergence of a new engineering science (in German) (5 May 2011)
- EKAH report: Synthetic biology - Ethical considerations (2010)

Netherlands

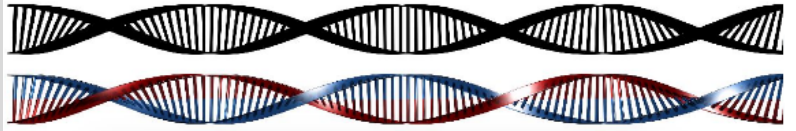
- KNAW: Synthetic biology: creating opportunities. (Report number 2008/19E) (with Health Council of the Netherlands and the Advisory Council on Health Research), 2008:
- KNAW: A code of conduct for biosecurity, 2009

United Kingdom

- The Royal Society of London, Supported BIOS working paper on Transnational Governance of Synthetic Biology (20 May 2011)
- Royal Society/OECD: Symposium on Opportunities and Challenges in the Emerging Field of Synthetic Biology
- Royal Society: 'Synthetic Biology Scientific Discussion Meeting Summary', August 2008
- Emerging technologies and social innovation. Report on the 3rd joint Royal Society - Science Council of Japan workshop on new and emerging technologies, Sept. 2008
- Royal Society activities on reducing the risk of the misuse of scientific research. Policy document 17/08.

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Emerging issues; Synthetic Biology and other fields



Advice work of European Academies on Synthetic Biology

Germany

- EASAC report - Realising European potential in synthetic biology: scientific opportunities and good governance (2010)
- Acatech/DFG/Leopoldina report: Synthetische Biologie: An Introduction" (Febr. 2011)

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European initiatives

- FP7 - National Science Advisory Board for Biosecurity
- Addressing Biosecurity Concerns Related to Synthetic Biology
- 3rd International Roundtable, "Sustaining Dual Use Research of Concern", November 5-7, 2008
- EMBO report: Strategic Plan for Outreach and Education
- EASAC report - Realising European potential in synthetic biology: scientific opportunities and good governance (2010)
- EASAC: Synthetic Biology: An Introduction" (Febr. 2011)

European initiatives

- FP7 - SYNBIOSAFE e-conference contributions
- Completion of all SYNBIOSAFE e-conference contributions
- Background document for the SYNBIOSAFE e-conference
- EMBO report: The role of social scientists in synthetic biology
- European Group on Ethics of science and new technologies (EGE) 2009: "Opinion on the ethics of synthetic biology", EGE, November 2009
- EMBL-EMBO, Conference on Systems and Synthetic Biology, 2008: "Systems and synthetic biology: scientific and social implications", Heidelberg, Germany, November 2008
- European Commission (2008). Recommendation on a code of conduct for responsible nanosciences and nanotechnologies research. C (2008) 424
- EMBL-EMBO, Conference on Systems and Synthetic Biology, 2008: "Systems and synthetic biology: scientific and social implications", Heidelberg, Germany, November 2008
- Emergence - a foundation for synthetic biology in Europe (FP6)
- TESSy final report: TESSy achievements and future perspectives in synthetic biology", December 2008
- COMEST Working Group on Environmental and Climate Change in Agriculture, Water Resource Management, 2011
- UNESCO - Ethics and Climate Change in Agriculture, Water Resource Management, 2011
- UNESCO - Representation and Decision-Making in Science and Technology, 2011
- BBSRC: Synthetic Biology - Social and Ethical Challenges
- BBSRC: Stem Cells - science and ethics
- International Risk Governance Council, 2008: Report 'Synthetic biology risks and opportunities for an emerging field' by J. Calvert & J. Tait
- UK Lloyd's Emerging Risks Team, 2009: Report 'Synthetic biology: influencing development' by Lloyd's Emerging Risks Team, July 2009
- UK's Parliamentary Office of Science and Technology (2008). Synthetic biology. POSTNote Number 298
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Different organization => different impact?

Network of different actors (coordinated efforts)



European Foresight Platform

supporting forward looking decision making
www.foresight-platform.eu

Scanning for Emerging Science and Technology Issues

EFP Brief No. 197

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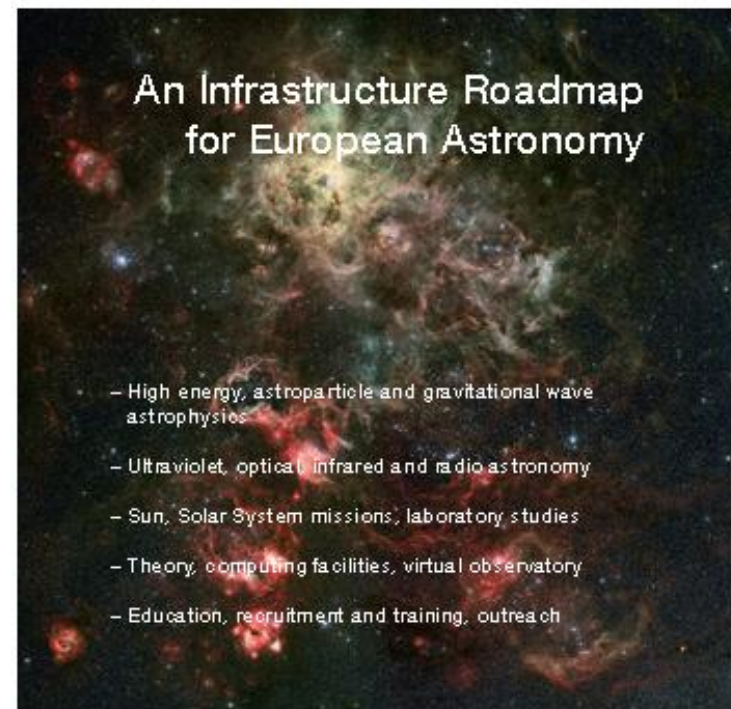
Sponsors: European Commission, FP7 SSH Programme

Type: Weak signal scanning for the European region

Organizer: SESTI Consortium, Maurits Butter maurits.butter@tno.nl

Duration: 10/2008-3/2010 **Budget:** 730k € **Time Horizon:** 2030 **Date of Brief:** July 2011

Open pan-European effort (integral effort)



WANTED: Authoritative „voice“ for European science foresight

Today's situation

- Many actors on national, institutional and scientific community level
- at European level:
 - Member organizations (ESF)
 - European associations (ALLEA)
 - European networks
 - European scientific communities (ASTRONET)

Very different impact of reports and recommendations.

Vision

- Establishing one pan-European voice in excellent science foresight
- Interacting with national bodies and relevant institutions
- Cooperating with expert institutions worldwide

Preconditions for science foresight with an impact

▪ **Input:**

- participation of eminent scientists, and upcoming young researchers which actively work in the field

▪ **Process:**

- science-based prioritization of topics
- governance of values and principles of scientific work (autonomous; quality-based; long-term)
- professional organization by a professional science foresight unit

▪ **Output:** authoritative recommendations with broadly acceptance in

- the respective scientific community, and
- within national research councils/research performers

Why attract the best available scientific talents?

TO REMEMBER: The reward system in Science – the Matthew effect (ROBERT MERTON, 1968)

“Famous scientists often receive disproportionate credit for their contributions, whereas lesser known scientists receive less credit than their contributions actually merit.”

Pragmatic argument: „...a scientific contribution will **have greater visibility** in the community of scientists **when it is introduced by a scientist of high rank** than when it is introduced by one who has not yet made this mark.” (p. 4) „For the development of science, **only work that is effectively perceived and utilized by other scientists,** then and there, **matters.**” (p. 5)

Value-added argument: „Not only do they have themselves achieve excellence, they have the **capacity for evoking excellence in others.**” (p.5)„... cognitive material presented by an outstanding scientist may **have greater stimulus value** that roughly the same kind of material presented by an obscure one...” (p. 6)

Reputation – main element for organising science foresight

Arguments from the Sociology of Science

„... scientists are **attracted to organisations which have high levels of reputation** by virtue of the fact that they are home to other highly regarded scientists.“ (FLORIDA, p. 8)

Arguments from the Economics of Science

„These highly regarded researchers provide a **crucial source of „pre-publication information“** by virtue of their standing in networks of scientific researchers.“ (FLORIDA, p. 9)

Arguments from reputational labor markets

„Prestige and reputation define the labor market of scientists... In addition, **recruitment of so-called „star-scientists“** can be said to have advantages in attracting other scientists...“ (p. 16)

Reputation – main element for organising science foresight (cont.)

Win-win elements

„The ability **to attract and retain star scientists confers broader reputational benefits and status** to the organization as a whole, bolstering its prestige and credibility in general.“ (p. 17)

„The organizational benefit stems from the **association of their reputation with** that laboratory and by extension with **the broader institution.**“ (p. 17)

„... scientific organisations arrange themselves to attract scientists and to interact with other scientific organisation.... Thus, **the nature of scientific norms and of scientific labor markets function as hard constraints to which organizational structures and practices are likely to conform.**“ (p. 22)

How to arrange science foresight to attract the best available scientific talent?

[Florida, R. (2000): Science, Reputation, and Organisation]

Organizational structures and practices of scientific organizations are the result of three interrelated phenomena:

- **Reputation** requires that scientific organisations arrange themselves in ways that can **attract eminent scientists**
- **Interaction** requires to adopt structures and practices that **facilitate meaningful linkages and connections to other scientific organizations**
- **Imitation** entails that scientific organizations seek to emulate and **learn from practices associated with other, leading scientific organizations.**

The key is how to organise science foresight

Excellent science foresight needs - like leading scientific organizations in general - certain structures and practices to attract the best available scientific talents:

- the **autonomous pursuit** of science foresight,
- **sole criterion** for selection of topics and experts is **scientific excellence**,
- a **distancing** of scientific **from application concerns** to identify new opportunities and promising fields of research (no priorities set by politics), and
- **open publication** of findings

And: The structures and practices should be adopted to **promote interaction** with other science foresight organisations and the **exchange of best practice** experiences.

Potential organisational contexts

- **Individual member organization** = appointed individual members (AAAS, National Academy USA, Royal Society, Max Planck Society) - **no pan-European equivalent**
- **Investigator-driven European funding agency** (ERC)
- (Independent **science rating, horizon and expert scanning unit** = **no European equivalent** to ISI or SCOPUS / Elsevier)
- **Institutional members organization** (ESF, ALLEA, etc.)
 - NEW: ScienceEurope