

JANUARY 2014

Newsletter



FOREWORD

Another busy year for ERASynBio has come to the end and we are now entering the last year of the project, working hard on regular activities, planning new ones and looking for further opportunities for our collaboration beyond the ERA-NET. The past 6 months have been very busy and the results are here. The Strategic Vision Paper is being finalized and the results of our 1st call for proposals will soon be made public. Meeting many of you at iGEM, the 2nd Strategic Conference, the IPR and Interdisciplinary Work Shop and working with you on various other occasions, has helped us on the way of creating a closely knit synthetic biology community in Europe and beyond.

We invite you to take a deeper look into our past activities and our plans for the near future. Don't miss the interesting piece on synthetic biology in society, learn about the 2013 iGEM as experienced by the young European iGEM participants, look into the state of synthetic biology in some of our partner countries and find opportunities to join the community.

As always, click on the [links](#), as they provide extra information and enjoy the read.

On behalf of ERASynBio we wish you a happy and prosperous 2014,

Kim Turk Križanec



Annette Kremser



ERASynBio Newsletter Editor
Ministry of Education, Science and Sport - MIZS
Slovenia

ERASynBio Coordinator
Project management Juelich – JUELICH
Germany

DEVELOPMENT AND COORDINATION OF SYNTHETIC BIOLOGY IN THE EUROPEAN RESEARCH AREA

ERASynBio aims at promoting the development of synthetic biology by structuring and coordinating national efforts and investment, with the final goal of creating a sound European research community in the field avoiding national fragmentation from the very start.

MAIN ACTIVITIES

- Supporting the emergence of national synthetic biology programs based on a strategic research agenda
- Transnational funding activities via joint calls (2 joint calls planned)
- Strengthening the scientific community by offering training and educational possibilities
- Developing recommendations on governance concepts and regulatory models by integrating ethical, legal, societal and technical aspects of synthetic biology
- Promoting close cooperation between academia and industry
- Providing extensive dialogue options and exchange fora in which all stakeholders are to participate

DURATION

36 months (1.1.2012 – 1.1.2015)

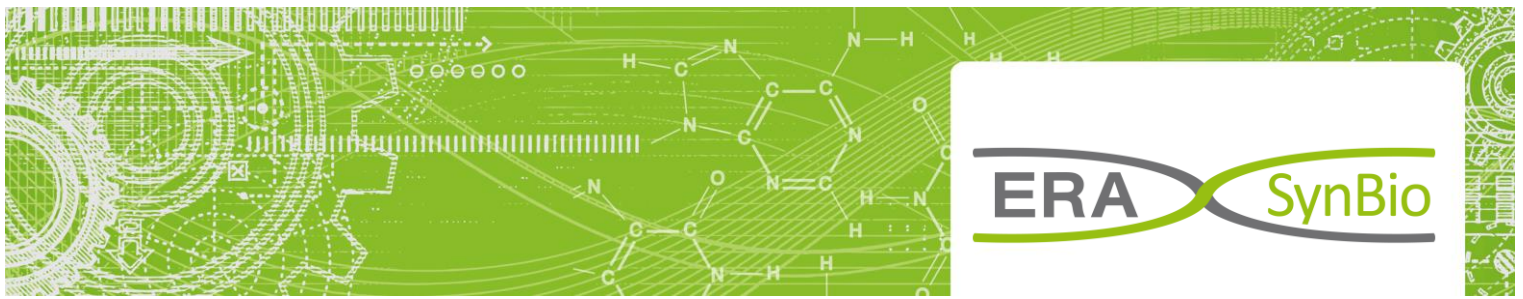
EC FUNDING

1.997.022 Euros

PARTNERS

16 from 14 European countries





ERASynBio IN ACTION

DEVELOPMENTS SO FAR

- iGEM Europe support, Lyon, October 2013
- 2nd Strategic conference, Edinburgh, October 2013
- IPR Workshop, Copenhagen, November 2013
- Synthetic Biology visiting tour, Copenhagen, November 2013
- Interdisciplinary workshop *Synthetic Biology in Action: From Genetic Engineering to Engineered Genetics*, Athens, December 2013

2st ERASynBio STRATEGIC CONFERENCE

by Andy Boyce, BBSRC

One of ERASynBio's major deliverables is to produce a Strategic Vision to inform future national and transnational policy development for synthetic biology. The 1st draft of this paper has been developed using ERASynBio's extensive mapping activities, the outputs of the 1st Strategic Conference (held in Basel in January 2013), and strategic papers produced by ERASynBio partners on governance and public dialog, training and education, and data and infrastructure. The aim of the 2nd Strategic Conference was to finalize the major themes and recommendations of this paper and to discuss opportunities for the implementation of the recommendations for the advancement of European and global synthetic biology.

The conference was held in Edinburgh at the end October. Leading researchers, policy makers and industry representatives took part in the two days of constructive and lively debates on the 1st draft of the Strategic Vision. From their feedback, ERASynBio will produce a final vision, which will be made publically available and used to inform the development of the ERASynBio 2nd Joint Call.

ERASYNBIO'S DEFINITION OF SYNTHETIC BIOLOGY

Synthetic Biology is the engineering of biology: the deliberate (re)design and construction of novel biological and biologically based parts, devices and systems to perform new functions for useful purposes, that draws on principles elucidated from biology and engineering.

WHAT'S AN ERA-Net?

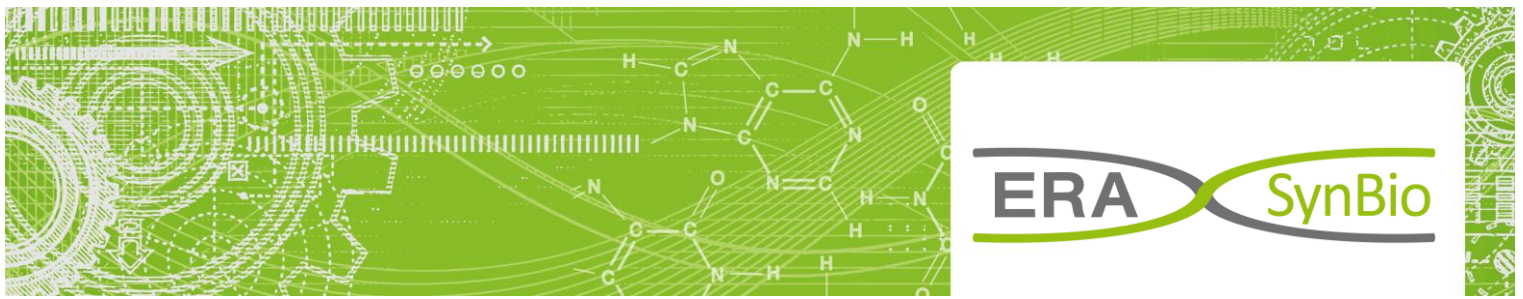
ERA-Net actions are part of the ERA-Net scheme under FP7 whose objective is to develop and strengthen the coordination of national and regional research programs supporting the development of the European Research Area.

ERA-Net actions provide a framework for actors implementing public research programs (ministries, research agencies) to coordinate their activities e.g. by developing joint activities and by mutually supporting joint calls for transnational proposals.

The funding of projects selected is provided by national agencies, while the funds obtained by the EC are used exclusively for the coordination and management of the network and its activities.

3rd call for twinning launched December 2013 open until 31 March 2014 with the aim to encourage new collaboration between researchers in synthetic biology, by establishing cross-border partnerships, with a focus on interdisciplinarity. Visit www.erasynbio.eu for more information or contact [François Kepes](#).





IPR workshop by Peder Fode, DASTI

The objective of the workshop was to identify the main critical Intellectual Property Rights (IPR) issues within the synthetic biology area that need reflection, discussion and advice. The workshop brought together leading IPR experts, industrial representatives and scientists from Europe.

The workshop took place the 26th of November in Copenhagen. Important issues were discussed and the information gathered provides an excellent starting point for some recommendations for the Strategic paper as part of the work in ERASynBio.

LOOKING INTO 2014

- Results of the 1st call will be known in February 2014
- 2nd transnational call is to be launched in June 2014 to address the strategic gaps and opportunities identified in the white paper
- Extra activities being explored in line with ERASynBio's continuation beyond 2014. STAY TUNED!

A SYNTHETIC BIOLOGY VISITING TOUR IN DENMARK,

By Peder Fode, DASTI

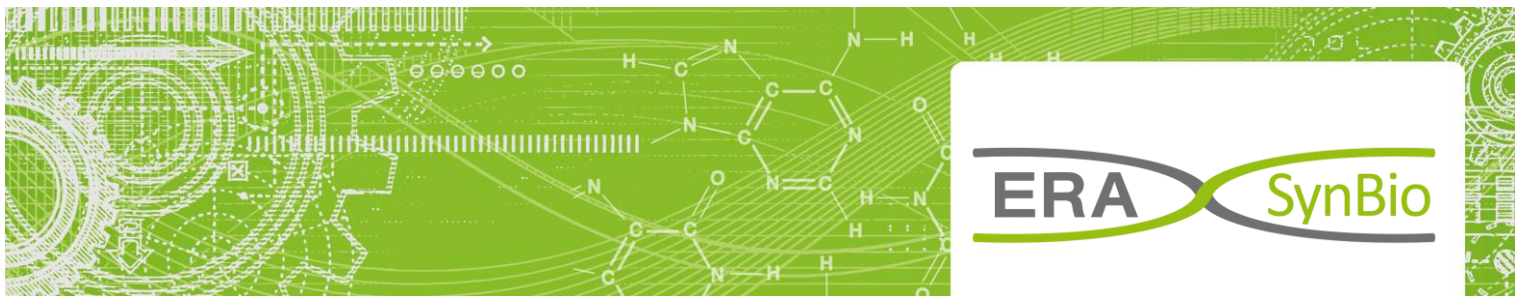
Approximately 35 attendees including ERASynBio partners, IPR experts, scientists and industrial representatives, were part of a synthetic biology visiting tour that took place in November 2013 with the aim of showing some of the facilities (private and public) that work within the field of synthetic biology in Denmark. Due to logistic reasons the tour took place only in the Copenhagen area but facilities working within the field are also found in Fyn and Jutland. The tour was hosted and organized by The Danish Council for Strategic Research (DASTI).

The tour was opened by Peter Olesen, Chairman of DASTI, with a short talk about the council and its involvement in synthetic biology and international collaboration. Then Professor and chair for the UNIK Center for Synthetic Biology at University of Copenhagen Birger Lindberg Møller presented the work in the center including the importance of communication. His talk was followed by a guided tour at the center before heading off to Novozymes A/S where senior director Carsten Hjort gave a presentation about synthetic biology in Novozymes A/S, followed by a guided tour at the production facilities.

Since synthetic biology is a discipline that involves a lot of ethical aspects we also met a biohacker, Martin Malthe Borch, and a bioethicist, Mickey Gjerris, who gave a talk about the ethical aspects of biohacking. Then John-Erik Stig Hansen, Director for Centre for Biosecurity and Biopreparedness gave a talk on biosecurity in Denmark focusing on the societal and ethical challenges for bioscience on a national plan. The day was closed with a dinner at Carlsberg Academy where Professor Flemming Besenbacher, chairman of the Carlsberg Brewery, and Birgitte Skadhauge, Research Director at Carlsberg Brewery presented the history of Carlsberg and the science behind it.

Next day we had a talk by head of Innovation at Scion DTU Helle Nielsen Elgaard who gave a talk about facilitating growth in high-tech SME's. This talk was followed by the presentation of Jørgen Hansen, CSO at Evolva, telling the story of evolution and success in synthetic biology at Evolva. The visiting tour ended at The Novo Nordisk Foundation Center for Biosustainability where Professor Jochen Förster, Professor Alex Toftgaard Nielsen, Dr. Irina Borodina and Dr. Michael Krogh Jensen presented the Biosustainability center and the work performed here.





EXPAND YOUR KNOWLEDGE

EVERY'14 THEMATIC RESEARCH SCHOOL on "advances in Systems and Synthetic Biology - Modelling complex biological systems in the context of genomics"



The upcoming session will take place in Evry on March 24-28, 2014.

The program includes conferences (topics and speakers listed on the right), hands-on tutorials, selected talks by students and post-docs, posters sessions, and meetings between biologists and modellers.

This cross-disciplinary Thematic School on Systems and Synthetic Biology is the thirteenth edition of a series started in 2002. If you want to learn more click [here](#).

Plans for the **ERASynBio 2nd Summer School** will be announced soon. The summer school will take place in the UK over the summer of 2014. Interested parties should check the ERASynBio website over the next few months for details.

EVERY'14 TOPICS AND SPEAKERS

Systems Biology of drug discovery

Nicolas Froloff (Dassault Systems, Velizy, FR)

Cécile Bonnard (Sobios, Boulogne, FR)

Antoine Bril (Centre de Recherches Servier, Suresnes, FR)

Modelling methods

Heike Siebert (FU. Berlin, DE)

Olivier Rivoire (U. Joseph Fourier, Grenoble, FR)

Metabolism

Ines Thiele (U Luxembourg, LU)

Alan Robinson (MRC Mitochondrial Biology Unit, Cambridge, UK)

Synthetic Biology I - Engineering of regulatory circuits

Lingchong You (Duke U., Durham NC, US)

Roman Jerala (National Inst. Of Chemistry, Ljubljana, SI)

Synthetic Biology II - Design

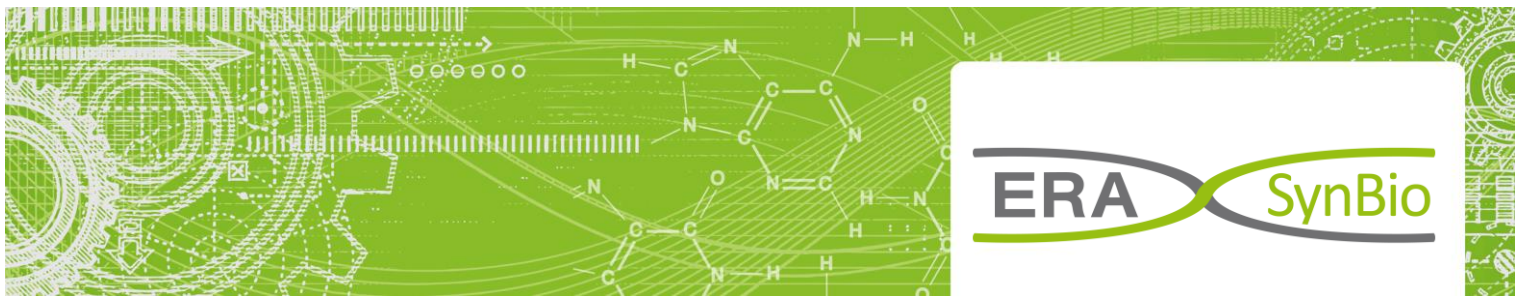
Jean Peccoud (Virginia Tech, Blacksburg, US)

Guy-Bart Stan (Imperial College London, UK)

IN FOCUS: Synthetic Biology in Society

Since 2010, the European Commission's "Science in Society" (SiS) Action Plan has focused on developing a governance concept responding to the grand societal challenges facing the European citizens: a Framework for Responsible Research and Innovation (RRI). Responsible Research and Innovation means that societal actors work together during the whole research and innovation process in order to better align both the processes and its outcomes, with the values, needs and expectations of society. Several societal challenges lie before us, spanning from sustainable food production, ecosystem restoration, optimized biofuel production, and improvement in human health. They will have a far better chance of being tackled if all societal actors are fully engaged in the co-construction of innovative solutions, products and services.

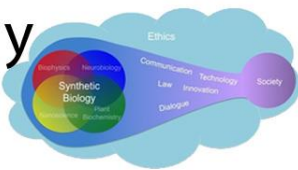




In this context, synbio is no exception. This new science offers huge potential for applications in energy, health and the environment. Yet, it also brings with it various challenges such as regulatory issues around biosafety, biosecurity and intellectual property rights, as well as potential environmental and socio-economic risks. However, polling studies in Europe and in the U.S. have shown that there is little or no public awareness about synthetic biology. It is thus essential to establish an open dialogue between stakeholders concerning this technology's potential benefits and risks and to explore the contours of what responsible governance means for synbio.

bioSYnergy

University of Copenhagen's
Excellence Fund for
Interdisciplinary Research



Scientific Social Responsibility is central to Synthetic biology success: Co-creation key to unlocking the full potential of Synthetic Biology by Maja Horst*

Scientific progress alone will not unlock the full potential of synbio. We need to take scientific social responsibility seriously and follow approaches that will be recognized as worthwhile by the general public. In Denmark, the Center for Synthetic Biology is exploring novel ways to do just that.

As a highly applied science, the development of synbio is very much aimed at implementation at market level. From controversies such as the GMO debates we have learned, that this is not straight-forward nor will it be successful unless the scientific community engages deeper in understanding the societal, ethical and value based dimensions of developing and introducing a novel technology. And this is not just a question of engaging in public dialogue – the measures needed point to a more fundamental change in the relationship between science and society.

Multi-stakeholder dialogue: Let's talk and listen

Center for Synthetic Biology at University of Copenhagen recently launched the bioSYnergy project. Herein, our dedicated research group will establish a novel and integrated ethics and communications benchmark platform for making society and scientists equipped for constructive dialogue on new technologies and scientific social responsibility. With the aim of making the outcomes of the bioSYnergy project as socially robust as possible, the platforms will support the bridging of the scientific community to the general public and politicians, NGOs as well as SMEs by incorporating a wide array of diverse perspectives and opinions on tech development.

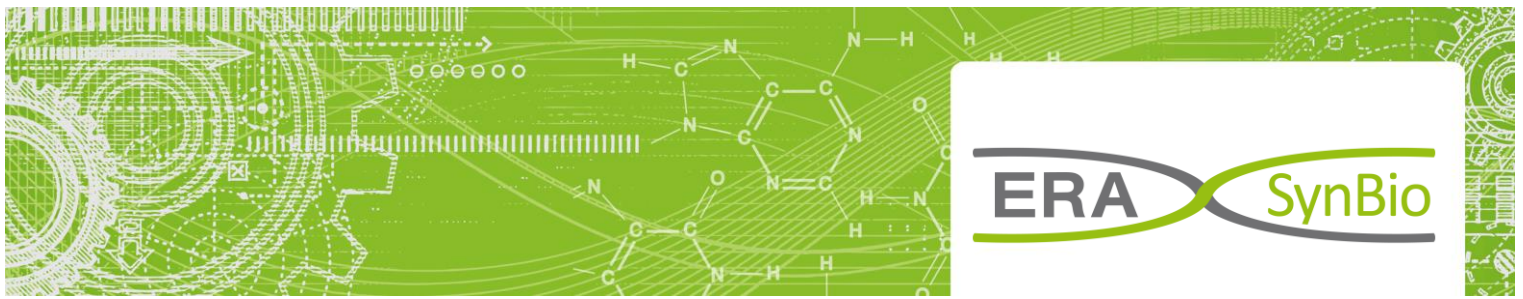
Scientific co-creation with pluralistic publics

The goal is to explore possibilities in constructive, co-creative engagement with external stakeholders - as opposed to an understanding of them as posing barriers to research. In this scenario, special focus will be given to 'the public', because – surprising as it might sound – there exists no such entity as 'the public'. Communication studies have long established that a pluralistic approach to the very many public sub-groups and their individual value-based habitus is essential for constructive dialogue and that public skepticism should not be seen as an impediment to science. Rather than just disregard it, we need to understand the fundamental origin of such skepticism and address it directly.

Set the Stage: Innovative dialogues at ESOF 2014

Crucial will be to envision controversies and skepticism as a key opportunity for developing better and more robust synbio innovations. And this novel co-creation mindframe will be open for exploration, when we launch our digitally interactive installation at [the Euroscience Open Forum](#) in June 2014 in Copenhagen. This will be the coming-to-life of the multi-stakeholder dialogue underlying scientific progress in a setting where the multitude of visitors will be able to interact with synbio in a fully immersed, tangible setting. From this we will harvest invaluable new knowledge of the democratization of scientific development – and just as any democracy participation is key. You are hereby invited to join the conversation!





*Maja Horst is Head of Department of Media, Cognition and Communication at Faculty of Humanities, University of Copenhagen, Denmark. In her work she has studied multiple public dialogues with special focus on stem cell and GMO debates. Read more about Maja [here](#). Read more about the Center's research [here](#).

READ MORE (links provided by Dr. Marcus Schmidt who works in the area of technology assessment of novel bio-, nano- and converging technologies (such as synthetic biology); explores the interface between science, society and art; and engages in documentary film production and art-science exhibitions)!

- Schmidt M, Meyer A, Cserer A. (2013). [The film festival Bio:fiction: sensing possibilities how a debate about synthetic biology might evolve.](#)
In: *Public Understanding of Science*. online first. DOI: 10.1177/0963662513503772
- Kerbe W, Schmidt M (2013). [Splicing boundaries: the experiences of bioart exhibition visitors.](#)
In: *Leonardo*. online first. DOI:10.1162/LEON_a_00701
- Meyer A, Cserer A, Schmidt M. 2013. [Frankenstein 2.0.: Identifying and characterising synthetic biology engineers in science fiction films.](#)
In: *Life Sciences, Society and Policy*. Vol: 9:9.
- Torgersen T, Schmidt M. 2013. [Frames and comparators: How might a debate on synthetic biology evolve?](#)
In: *Futures*. Vol. 48: 44-54
- Schmidt M. 2013. [Safeguarding the Genetic Firewall with Xenobiology.](#)
In: *ISGP. 2013. 21st Century Borders/Synthetic Biology: Focus on Responsibility and Governance*. P.55-65

SYNERGENE: 28 European and International Networks and Institutions Mobilize to Foster Responsible Research and Innovation in the Field of Synthetic Biology

SYNERGENE is a 4-year international initiative funded by the European Commission' FP7 Program with an overall contribution of nearly 4 million Euro, which will foster responsible governance of synthetic biology by initiating mutual learning processes among a wide variety of stakeholders from science, industry, civil society, policy, education and art. The iterative mutual learning process within SYNERGENE will contribute to a better understanding of synthetic biology research and innovation and will enhance public engagement, while at the same time stimulating reflection on novel approaches to an inclusive governance framework that is capable of fostering responsible research and innovation. Activities will be structured by four platforms, highlighting synthetic biology's future, public, cultural and technological innovation perspectives.

SYNERGENE will be international in scope and remain open to change in order to accommodate the dynamics of an emergent field.



2nd Bio-fiction Science Art and Film Festival



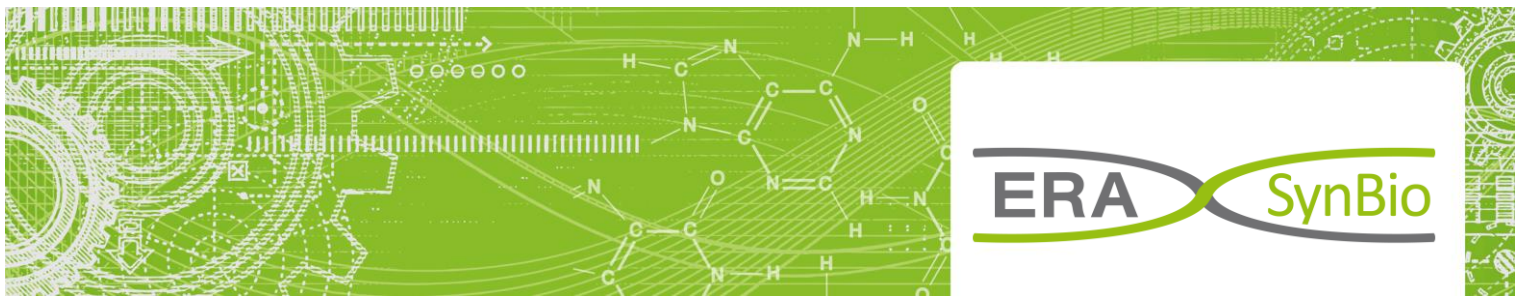
When: 23.-25.10.2014

Where: Vienna, Museum of Natural History

What: a short film competition with 6000 EUR award fund. Short films dealing with synthetic biology can be submitted to Biofaction (Kundmangasse 39/12, 1030 Vienna, Austria).

Deadline: 30.6.2014





iGEM 2013

ERaSynBio was a proud supporter of the 2013 iGEM European Regional Jamboree, supporting **teams advancing** to the iGEM World Jamboree. The teams did exceptionally well at the World Jamboree, with **Heidelberg** (undergrad) and **Paris Bettencourt** (overgrad) winning the grand prize, **TU Munich** (undergrad) and **Bielefeld Germany** (overgrad) being the 1st runner-ups and **Imperial College** the 2nd (undergrad). Additionally, 16 European teams received other **awards**.



Thanks to teams Heidelberg, TU Eindhoven, Edinburgh, Paris Bettencourt, ETH Zürich, TU Munich, Freiburg, Valencia Biocampus, KU Leuven, Imperial College London, Uppsala University, EPF Lausanne, UNITN-TRENTO, Gottingen, Evry, Manchester, Bielefeld Germany and SDU Denmark, please find below an insight into the iGEM experience.

Reasons for participation - *getting to know how science is done and how much work it implies*

Unique educational experience allowing students to be creative, put knowledge into practice and do hands-on science, try new ideas, explore the field of SB, expand the boundaries of knowledge, realize own project vision, fun way to improve team work and lab skills, expand professional network and meet peers with a similar interest in science from around the world, first-hand experience in lab, work in a multidisciplinary team, work on a self-chosen project that might be too risky to do for a PhD, take up responsibility as a valuable experience for later career, engage in a rare opportunity for undergrads to design, peruse and explore a scientific project independently and form scratch, not only carry out work in the wet lab but also engage with people and organizations interested in effects of SB on the world around us, seize the opportunity to have a great summer and travel.

Expectations vs. Reality – *when reality is brighter than your wildest dreams*

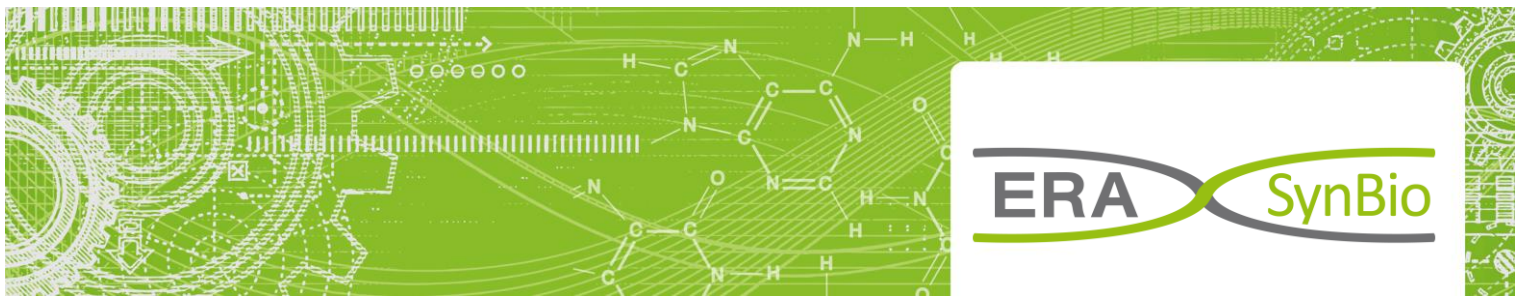
You don't become part of iGEM, iGEM becomes part of you, both in terms of time and emotion! Some lucky as most of their ideas actually worked out, others dealt with unpredictability and frustrating results, work outside the lab took up just as much time as lab work, contacts with other teams were overall not helpful in finding opportunities, e.g. PhD positions / internships, keeping motivation a key challenge, need to be realistic but aiming for the step further, importance of distinguishing between main and reasonable subgoals to keep morale high, fun combined with stress and frustration followed by unexpected satisfaction, making it a surprisingly enjoyable experience, that leaves you with wanting to do more even after the competition is over.

Origin of project idea - *from personal experience to country specifics and world problems*

Brainstorming, thorough assessment of available expertise, exhaustive research on topics, feasibility of idea, looking at new techniques rather than an overall problem, taking a risk to undertake a very ambitious project, wanting for the project to have an impact and be of use to other scientists, making sure the idea makes sense in the real world and addresses a real problem, building on previous iGEM projects, looking into country specific comparative advantages and local specialties, personal experience.

If you want to learn more about the iGEM, click [here](#). To learn more about the teams visit [their wikis](#).





Impact on future plans – *no better way to explore opportunities in SB*

Yet to be seen, but it is already clear iGEM's changed lives, expansion of academic and professional networks for future collaborations outside of home universities and specialties, invitation to iGAM4ER, publishing research in the ACS journal, continuation of project with the aim to publish work in reputed journal, the iGEM experience in CV will help find interesting internships and jobs, more research involved in future careers, looking towards the (pharmaceutical) industry for future careers, research opportunities presented, working in a lab is not for everyone.

Constraints - *when a day just has 24 hours, experiments are pricy and manpower disorganized*

finding a group willing to share lab space and equipment, finding a supervisor, lack of HR – need to multitask, huge workload, US governmental shutdown, new academic year, budget (institutional support crucial), administrative issues

Lessons learned – *Success comes naturally if you are driven and like what you do*

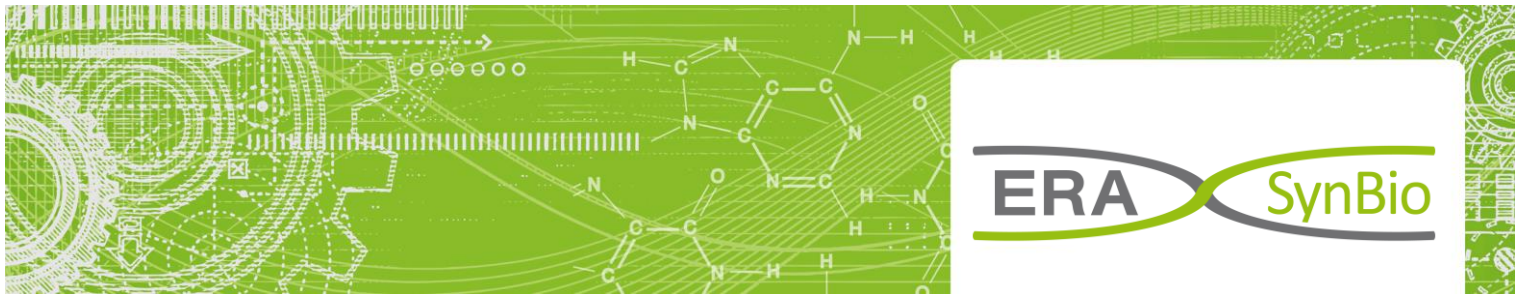
iGEM is an intensive learning experience and a motivating challenge, a crash course in many things from molecular biology to time management and confidence acquisition, it teaches you more than any lecture, practical training, challenge of working in a team, organize workflows and finances, scientific aspects, engaging society in science is a worthwhile experience, multidisciplinary reflects the complexity of the project, it makes it more difficult to communicate, but at the end of the day it enables all t learn much more, every aspect of the project is important, success implies collaboration within the team and among teams, early scheduling of activities is crucial, big groups slow down progress as decision making and taking responsibility is more complex, approaching the industry and other institutions to ask for funds, team composition is key: importance of matching expectations and motivation among team members – different attitudes and priorities lead to different levels of commitment, disappointment and conflict, successful communication of scientific ideas to sponsors, the public and the media, democratic decisions take longer, a smaller budget can be substituted with harder work and enthusiasm, a good presentation is important, start lab work early, refrain from overly complicated projects, communication among team members is key, success takes time but hard work allows you to gain it, when doing research you should never be happy or unhappy too fast, in order to succeed you must accept that: experiments will fail, you will run out of time, some things are just above what's possible and emotions don't help you in being efficient, iGEM is a good reminder that we are still students, who have much to learn still, iGEM is a lot of hard work and short nights.



Assessment of the competition – *iGEM is more about celebrating each other's success than a competition*

Fun, inspiring, exciting, competitive, full of great team effort and passion, sense of community and collaboration is more important, getting to know iGEMers and their projects, high level of European projects compared to other regions: EJ more competitive and if a teams does well in the EJ, it had a good opportunity to do well in the WJ, Great experience being surrounded by so many likeminded people, projects were "cool" and close to the "grown up" scientific world, good to have regional and World Championships, as it makes advancing so much more special, + WJ: logistics and organization, + EJ: poster session allowed for more idea swapping, opinion and impressions exchange, - WJ & EJ: tough schedule, time between both Jamborees to improve project too short, problematic over/undergrad categories and unequal team size.





Synthetic Biology in Portugal

The Portuguese scientific community in synthetic biology has been steadily growing and asserting its competence both at European and international level. The FCT supports this scientific area through the funding of research projects and other initiatives such as MIT-Portugal.

Since 2007, FCT has funded around 30 synbio projects comprising a total budget of around 4M€. Within the MIT-Portugal program, synbio was identified as a priority theme. A PhD program was launched, where Portuguese and MIT scientists share responsibilities in a collaborative supervision of PhD thesis.

The Portuguese researchers in synbio work in institutions of international renowned reputation such as **CEB**, **BERG**, **IBMC** and **ITQB**, with the capacity to integrate European research projects such as the BIOMODULAR-H2, BioNano-Switch and NEONUCLEI, involving a budget of 7.5M€.



Fundação para a Ciência e a Tecnologia (FCT) is Portugal's main funding agency. It is a public autonomous institute under the aegis of the Ministry of

Science, Technology and Higher Education, which covers all fields of science, aiming at capability enhancement and research excellence and is also responsible for bilateral and multilateral international agreements in science and technology.

FCT's mission is to promote the advancement of scientific and technological knowledge in Portugal, explore opportunities to attain the highest international standards in the creation of knowledge, stimulating their diffusion, and to contribute to improving education, health, environment, and the quality of life and well-being of the general public.

FCT funding is structured around the following schemes: promotion of training and career development (fellowships, scholarships, mainly for PhD, Post-doc and PhD in industry), support of centers of excellence (associated laboratories) and research centers (institutional funding), support to infrastructures, promotion and development of scientific activity (research projects) and for diffusion of scientific culture.

Synthetic Biology in Slovenia



REPUBLIKA SLOVENIJA
**MINISTRSTVO ZA IZOBRAŽEVANJE,
ZNANOST IN ŠPORT**

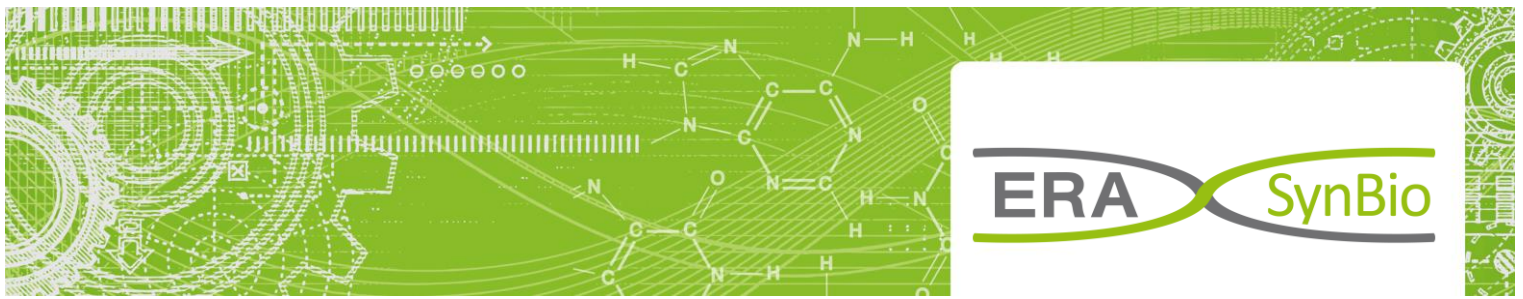
The Ministry of Education, Science and Sport defines the expert bases for the adoption of political documents in the field of research policy. It drafts laws and implements regulations on research activities. It establishes and enhances the system of comprehensive analyses and monitoring of the developments in research, develops new tools for attaining research policy goals, and plans the required financial resources for research.

The main instruments for research financing, mainly implemented through the Slovenian Research Agency, are research programs (long term, 5-year projects), basic and applied research projects, target research programs, the young research program, research infrastructures and international cooperation.

The 1st steps of Slovenian researchers into synbio started in 2006, which coincided with participation at iGEM competition, which were mentored by the researchers from the Department of biochemistry at the National institute of chemistry with participation of researchers from the University of Ljubljana. Successes of Slovenian iGEM teams from 2006-2011 clearly facilitated the development of synbio and contributed to the fact that the awareness of synbio in Slovenia is according to the Eurostat among the highest within Europe.

The main players in synbio are academic researchers from research institutions and universities, pharmaceutical and small biotech companies. Synbio was included as one of the research areas of the **Centre of excellence EN-FIST** that fosters collaboration between academia and companies and that provided the research infrastructure. The strongest tracks of Synbio research in Slovenia includes medical application based on mammalian cells, information processing, bionanomaterials and biosynthesis. Up to now there have been no dedicated funding for synbio with exception of participation at the ERANET SynBio call.





Synthetic Biology in Switzerland



Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Confederation

Commission for Technology and Innovation CTI

The Commission for Technology and Innovation (CTI) promotes science-based innovation in Switzerland by providing financial

resources, professional advice and networks. Based on a strong bottom-up approach, the CTI helps innovations to achieve their breakthrough by co-funding research and development projects run jointly by companies, public agencies or non-profit organizations with entitled research institutions.

The CTI promotes also entrepreneurial thinking among young scientists and business people as well as knowledge and technology transfer (KTT) between universities and industry in order to boost innovative projects. Training and coaching programs provide young entrepreneurs with professional support in putting their business ideas into practice. Innovation mentors provide information on funding opportunities and support in drawing up project applications. The national thematic networks (NTN) help to form links between companies and public research institutions in thematic areas which are of particular interest to Switzerland.

Switzerland and in particular the ETH was one of the pioneers in European synthetic biology, successfully participating in many of the early calls of the European Union Framework Program 6 (and later in Framework Program 7), advising the EU-commission (2004/05), hosting the first conference on synthetic biology in Europe (Synthetic Biology 3.0 in 2007), sending one of the first two European teams to the iGEM competition ("The ETHZ Chaos Cloning Club" presenting a biological counter, 2005), and offering the first European class in Synthetic Biology to students (2006).

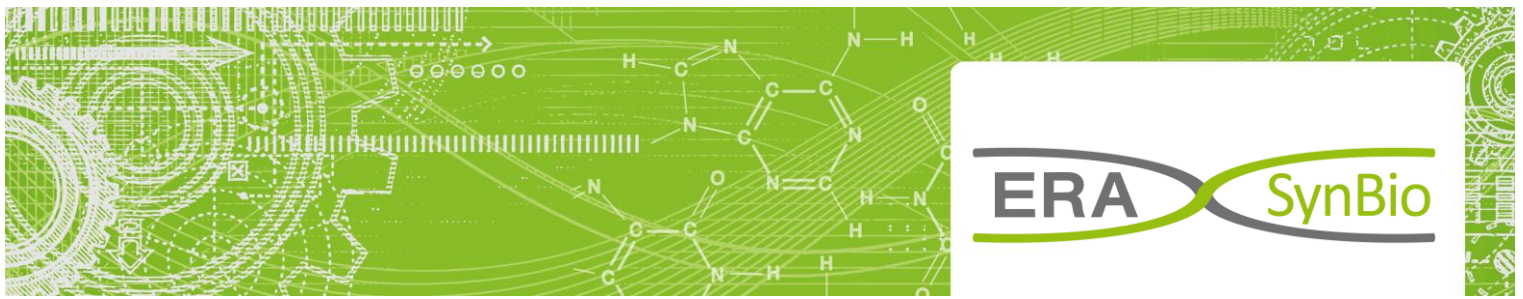
Since then, the topic has captured the imagination of many scientists in Switzerland in fields from metabolic engineering to nanotechnology, from genetic circuits to expanding biochemistry into novel realms, creating one of the largest and most vibrant synthetic biology communities in Europe. Synthetic biology in Switzerland benefits from a powerful industrial cluster of pharmaceutical and chemical firms, a well-funded national research system, and excellent universities including the technical university with its two locations (ETH Zurich and EPF Lausanne), research universities in Basel, Lausanne and Geneva, and additional national research initiatives such as [SystemsX.ch](#) in systems biology.

The Department of Biosystems Science and Engineering D-BSSE

D-BSSE in Basel was founded in 2009 as an audacious attempt to shape the future of biological research and engineering. It unites under one roof theoreticians, wet-lab scientists focused on different fundamental biological questions, and engineers focused on technology development and in particular synthetic biology. It was started with an initial grant of 100 mln CHF (approx. 85 mln €) and is now a regular department of ETH Zurich. It is the home of many exciting developments in synthetic biology, from the first mammalian oscillator (Fussenegger) via cellular automata to calculate the cancerogenic state of cells (Benenson) to cyborg cells (Khammash), and of the ETHZ iGEM teams (Stelling & Panke).

A National Competence Center of Research NCCR on *Molecular Systems Engineering* will be launched in 2014 and last for at least 4 years (typically up to 12 years). It intends to break through the barriers of traditional molecular engineering, and develop new engineering principles that allow the combination of individual molecular modules to form working molecular systems – molecular assembly lines of quasi-cellular complexity. For more information visit the [SNF-webpage](#).





News from the UK

Innovation and Knowledge Centre for Synthetic Biology

The UK Biotechnology and Biological Sciences Research Council (BBSRC), Engineering and Physical Sciences Research Council (EPSRC) and Technology Strategy Board (TSB) have announced a new £10M Innovation and Knowledge Centre (IKC), that will boost the UK's ability to translate the emerging field of synthetic biology into application and provide a bridge between academia and industry was announced today. The IKC, to be called SynbiCITE, will be based at Imperial College London and led by Professor Richard Kitney and Professor Paul Freemont. Its main aim will be to act as an Industrial Translation Engine that can integrate university and industry based research in synthetic biology into industrial process and products.

UK funding to build world-first synthetic yeast

BBSRC has awarded €1,200,000 to allow UK scientists to join an international effort to build the world's first synthetic yeast. The UK team from Imperial College London join an international consortium from the USA, China and India. They will build and test Synthetic Chromosome XI, which is 0.7 million DNA base pairs long. Once all parts of the genome are complete, scientists can design new strains of the yeast *Saccharomyces cerevisiae* to make products including chemicals, vaccines and biofuels.

China Partnering Awards

Synthetic biology links between the UK and China is boosted by the announcement of five grants awarded through the China Partnering Award Scheme. A total of €150,000 will be provided by BBSRC and EPSRC to UK scientists, with the Chinese Academy of Sciences (CAS) providing matched funding to Chinese researchers, for activities such as exchange of early career researchers, workshops, reciprocal access to facilities, networking and travel. The funding is provided for up to four years and it is anticipated that the partnerships will lead to new joint grant applications and high impact research.

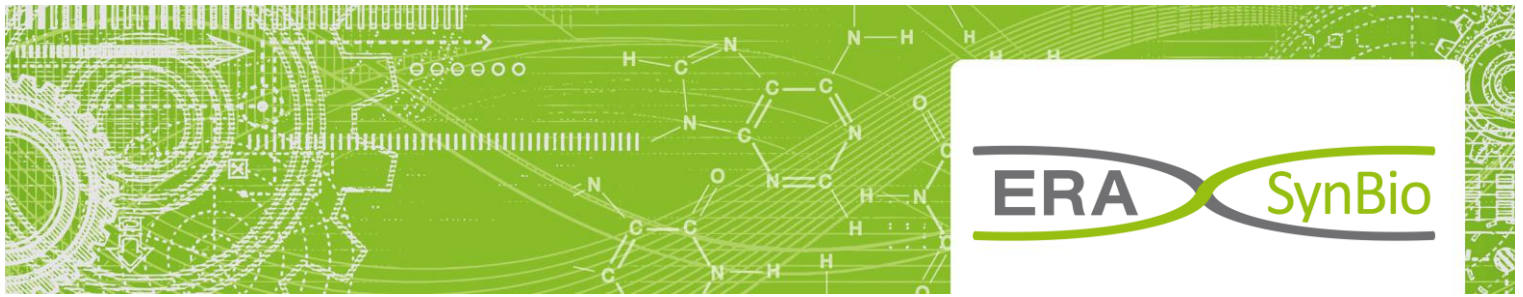
Synthetic biology investment fund

Entrepreneurial UK scientists in the synthetic biology space can benefit from a new €12,000,000 investment fund that opened for business in November. The new fund will help companies in the early stages of their journey towards sustainability, through investment, strategic support and leveraging private capital. The synthetic biology fund will be managed by private investment specialists Midven through its association with the long-established Rainbow Seed Fund, which provides kick-starting finance to technology start-up companies that evolve (or 'spin-out') from publicly-funded research.

Tools and services for synthetic biology

TSB, BBSRC, EPSRC and the Welsh Government are investing up to £3.8m in business-led projects to develop innovative tools and services for the UK synthetic biology industry. This competition will help to establish a portfolio of tools and services which will improve competitiveness and profitability within the UK synthetic biology industry, while also opening up new market opportunities for the providers of those tools and services.





MEET THE PARTNERS*

*Click on the partner names to learn more about them

Austria



France



Germany



The Netherlands



Portugal



Spain



United Kingdom



Denmark



Finland



Greece



Latvia



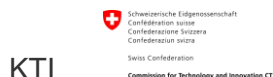
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