

Note of the 2nd Meeting of European Systems Biology Centres

11-12 September 2008, Düsseldorf, Germany

SUMMARY

The ERA-NET in Systems Biology ERASysBio proposes to establish Networks of Systems Biology Centres (NSBCs) as the best vehicle to implement the most urgent actions on training, data standards, data management, and academic-industrial links in systems biology.

The **2nd Meeting of European Systems Biology** focused mainly on considering how, specifically, centres can work together in developing these European activities. Ideas for network proposals were developed at this meeting in preparation for the ERASysBio+ Call, to be launched in autumn 2008.

OBJECTIVES

- to provide an update on European systems biology activities;
- to seek consensus on the concept of a systems biology network under ERASysBio;
- to identify specific systems biology networks and their area coordinators.

PARTICIPANTS

Heads of established European Systems Biology Centres or their deputies were invited to attend, to discuss and agree on common interests and actions. ERASysBio partners consider that such Centres will possess:

- a concentration of research facilities within a single, appropriate and dedicated physical space run under one national programme;
- a long term commitment of space, research facilities and staff within a philosophy of interdisciplinary working;
- a reservoir of skilled technical staff capable of supporting the necessary range of HTP and other advanced technologies to be deployed, and a commitment to their retention, training and development;
- a matured effective policy and provision for data capture, management and storage;
- a vision and strategy for developing at the cutting edge of integrative systems biology;
- a commitment to outreach, engage and train, and to attract and engage other top-class scientists and engineers from within and outside the institution.

Representatives from other European projects, which current activities and plans are relevant to Systems Biology Centres, were also invited to the meeting.

The purpose of this was:

- to provide European Systems Biology Centres with an update on current activities and the progress of these projects;
- to provide European Systems Biology Centres with a wider context in which the NSBCs could be created;
- to seek input from European Systems Biology Centres on their participation and their role in developing these European projects.

Systems Biology Centres		Representative
Norwegian University of Science and Technology	NO	Martin Kuiper
Systems Biology of Virus-Cell Interactions	DE	Angela Oberthuer
Freiburg Initiative for Systems Biology	DE	Ralf Baumeister
Freiburg Initiative for Systems Biology	DE	Klaus Palme
Max Planck Institute for Dynamics of Complex Technical Systems	DE	Susanne Hollmann
Center Systems Biology Stuttgart	DE	Klaus Pfizenmaier
Max Planck Institute of Molecular Plant Physiology	DE	Lothar Willmitzer
EMBL/CRG Systems Biology Research Unit	ES	Luis Serrano
Conway Institute	IR	Janet Allen
Microsoft Research - University of Trento	IT	Corrado Priami
Centre for Integrative Biology	IT	Alessandro Quattrone
VU Amsterdam / Kluver Centre Consortium	NL	Bas Teusink
Netherlands Institute for Systems Biology	NL	Roel van Driel
Centre for Integrative Genetics	NO	Stig Omholt
Centre for Functional Genomics and Bio-Chips, University of Ljubljana	SI	Damjana Rozman
CSIC Systems Biology Unit	ES	Santiago Elena
The Oxford Centre for Integrative Systems Biology	UK	Bela Novak
Multidisciplinary Centre Integrative Biology at Nottingham	UK	Tony Pridmore
The Manchester Centre for Integrative Systems Biology	UK	Pedro Mendes
Centre for Integrative Systems Biology of Ageing and Nutrition	UK	Darren Wilkinson
Centre for Systems Biology at Edinburgh	UK	Elizabeth Elliot
Warwick Systems Biology Centre	UK	Nigel Burroughs
Centre for Integrative Systems Biology at Imperial College London	UK	Jaroslav Stark
Institute of Systems and Synthetic Biology (ISSB) at Genopole	FR	François Kepes
Guests		
Max Planck Institute for Molecular Genetics, Berlin	DE	Hans Lehrach
Chair of the ESFRI Biological & Medical Sciences Roadmap Working Group	DE	Eckhart Curtius
European Bioinformatics Institute - ELIXIR	UK	Andrew Lyall
Funding organisations		
Project Management Jülich, PtJ	DE	Veronika Simons
Federal Ministry for Science and Research, BMWF	AT	Nicole Firnberg
Netherlands Organisation for Scientific Research, NOW and Netherlands Organisation for Health Research and Development, ZonMw	NL	Luc Rietveld
Research Council of Norway, RCN	NO	Steinar Bergseth
Biotechnology and Biological Sciences Research Council, BBSRC	UK	Gabriela Pastori
Ministry of Science and Innovation, MICINN	ES	José Salas
Science Foundation Ireland, SFI	IR	Declan Healy
Project Management Jülich, PtJ	DE	Gisela Miczka
ERASysBio Network Steering Committee Chair	UK	Colin Miles
Project Management Jülich, PtJ	DE	Maike Heidelberger

PROGRAMME

The programme was designed to allow participants to focus on relevant aspects where centres can network, integrate and develop common activities. These discussions were held in breakout groups and their outcomes presented at the final session. The programme included short presentations from European projects that are highly relevant to the Centres.

The meeting started with the welcoming remarks from Veronika Simons, ERASysBio Coordinator, and an introduction to the aims of meeting and expected outcomes by Colin Miles, representing Alf Game, Chair of the ERASysBio Network Steering Committee.

Session 1, The European Context, was chaired by Gabriela Pastori and included presentations by Roel van Driel on Systems Biology of Metabolic Syndrome (SBMS); Eckhart Curtius on European Infrastructure for Systems Biology (EISB); and Andrew Lyall on European Life Science Infrastructure for Biological Information (ELIXIR).

Roel van Driel presented SBMS, a project with the ambition to initiate a large-scale, highly coordinated and focused European effort in the field of Metabolic Syndrome, in which the systems biology approach is the integrator of different data sets and the driver of research. Roel gave an overview of the aims and aspirations of the SBMS initiative, described the main objectives of the SBMS Roadmap and the actions taking place in the coming months, e.g. SBMS workshop in Berlin.

Eckhart Curtius gave an overview of ESFRI and its mission, the Roadmap and its associated Working Groups, the range of projects selected as mature and the process leading up to their launch, and the European Infrastructure for Systems Biology (EISB) as an emerging infrastructure which required urgently the input and support from its scientific community.

Eckhart expressed clearly that projects of this magnitude must originate in the scientific communities involved through a new philosophy of collaborative working. It's the community who should unite, organise itself and think 'large scale' for the benefit of all. Eckhart urged the leaders of Systems Biology Centres to get together and come up with a proposal for a EISB, in a way similar to the physical sciences communities. The Centres are in an excellent position to propose an infrastructure that makes the most of the resources already available and fulfils the requirements that will consolidate Systems Biology in Europe.

As a result, Jaroslav Stark expressed his full support to this proposal and his will to take the initiative forward. A working group of no more than six members should now be constituted. BBSRC has offered support to the setting up and running of this working group.

Andrew Lyall gave overview of ELIXIR, one of the six ESFRI projects selected as mature and having been awarded a 3-year preparatory phase grant from the EC. The preparatory phase should allow ELIXIR to develop proposals to construct and operate a sustainable infrastructure for biological information in Europe that supports life science research and its translation to medicine and the environment, the bio-industries and society. The programme includes a feasibility assessment relating to the provision of support for archiving and distribution of models for systems biology, led by Nicholas Le Novère at EBI-Hinxton.

Session 2, Updates from Systems Biology Centres, was chaired by Gisela Miczka and consisted of a Tour de Table where representatives from the European Systems

Biology Centres gave, in 4 min, an update on relevant activities and progress of the centres and their expectations for this meeting.

Day one finished with **Session 3, What is a network**, chaired by Luc Rietveld and presented by Tony Pridmore, Domain Director – Data, at MyCIB, Nottingham, UK. Tony presented an overview of **Networks @ Nottingham**, as examples of the variety of approaches and aims that networks can take to address issues specific to the communities they serve. These could be focused on: 1) a biological theme or problem; 2) a research methodology; 3) tools and resources; 4) community building.

Session 4, Towards establishing Networks of Systems Biology Centres (NSBCs), was chaired by Steinar Bergseth and Gabriela Pastori. This session consisted of participants discussing in break-out groups:

1) The concept of a network, its purpose, components, governance

Participants were asked discuss and reach consensus on the following questions:

- What is a network?
- What does a network do?
- What are the essential components of a network?
- What structure does a network have?
- What makes a network different to a project consortium?

2) Specific areas that should constitute the basis of a European network

Participants were asked to identify specific areas within each of the following bullet points:

- Training and career structure
- Thematic areas
- Technology development
- Data/models management
- Industry/Knowledge Transfer

3) Proposals for networks. Participants were asked to: a) describe the subject of the network(s), its/their aim, content, structure and governance; b) identify an area coordinator for each network.

At the **Final Session, Network Proposals** chaired Colin Miles; the following ideas for network proposals were presented:

1) Knowledge Transfer – Systems Biology Europe

Area coordinators: Jaroslav Stark (Imperial) and Elizabeth Elliot (Edinburgh)

Aim: to provide a unified public image, a face outwards to public, politicians, non-systems biology communities.

Activities:

- Website-portal-multilayer: technologies, expertise, public face
- Case studies: no hype, good examples
- Advocacy/ Engagement / Active PR: sharing expertise, editorial, lobbying funding and politicians
- Non-sys bio portal: workflow, contact points by geography and by research theme, good practice
- Industry: contact point for PhD and PDRA opportunities
- Sys Bio expert: community, contact point
- Funding: current projects, working relationships, future opportunities
- Mentoring / networking

Resources:

- 1 x figure head: Steering Group + 1 voice to promote the organization
- Coordinator with relevant experience
- Webmaster
- Meetings: steering group, institute coordinators (1 per year), with journalists
- Travel: 3-4 conferences per year

2) Quantitative image analysis

Area Coordinator: Tony Pridmore (Nottingham)

Aim and description: to be developed by Tony and circulated to all.

3) Cancer - kinome

Area coordinator: to be agreed.

Aim and description: to be developed.

Groups: Berlin, Freiburg, Stuttgart, Trento, Oxford, (Heidelberg)

Samples: Mouse genetics, C. Elegans, Yeast analysis, Kinome cell cycle

4) An inventory of systems biology – the basis for SysBio Centres in Europe

Area coordinator: Bas Teusink (Amsterdam)

Aims (in steps):

- Step 1: Set up a knowledge base - create a database with real content and useful portal for instant info on:
 - research topics
 - people
 - courses, teaching materials
 - techniques and specialist equipment
 - protocols, standards, tools, databases, strains and constructs
- Step 2: Exchange people and knowledge
 - exchange students & researchers for direct collaboration
 - meeting on specific issues, e.g. teaching, specific calls, topics, identified through the SysBio inventory
 - summer schools or courses
- Step 3: Basis for identifying needs and new directions
 - lobbying with one voice
 - travelling

Resources:

- 2x FTEs (PDRAs) travelling around and getting info, plus 1xFTE to develop database and maintain it.
- Video-conferencing
- Steering committee (10 people)

- Travel
- 20 centres, 25 people @1k€ = 500k€/year
- 3x FTEs at 250k€/year = 5 years at 3750k€

5) Modelling frameworks

Area coordinator: Pedro Mendes (Manchester)

Deliverable: What experiments you need to do to make it model-data driven and viceversa.

Content:

- Provide a resource, kind of information for e.g. metabolic networks, a list of what is available and also what the community needs.
- Provide a website-wiki, and a coordinator/editor visiting regularly the Centres collating information on types of modeling, experiments, etc. The website-wiki should include a list of standards and protocols.
- Members: to include clinicians and industry

Aim: to produce a paper, to outreach through e.g. summer schools, experiments for modelers, modelling for experimentalists.

6) Virus-cell interactions

Area coordinator: Santiago Elena (Madrid)

Aim and description: to be developed.

7) Aging

Area coordinator: Darren Wilkinson (Newcastle)

Aim and description: to be developed.

8) Synthetic Biology

Area coordinator: Francois Kepes (Evry - Paris)

Aim and description: to be developed.

Follow-up and closing remarks

Colin Miles thanked all participants for their contribution to the meeting and encouraged them to further develop the network proposals generated at the meeting, which alongside other ideas could constitute the basis for network applications to the ERASysBio+ transnational call.