

**Note of the Meeting of the European Systems Biology Centres  
7-8 March 2007, Imperial College, London**

**Participants**

- Judith Armitage – The Oxford Centre for Integrative Systems Biology, UK
- Roel van Driel – Netherlands Institute for Systems Biology
- Roland Eils – German Cancer Research Centre, Heidelberg, Germany
- Wolfgang Hess - Freiburg Initiative for Systems Biology, Freiburg, Germany
- Charlie Hodgman – Multidisciplinary Centre Integrative Biology at Nottingham, UK (day 1 only)
- Douglas Kell- The Manchester Centre for Integrative Systems Biology, UK
- Thomas Kirkwood – Centre for Integrative Systems Biology of Ageing and Nutrition, Newcastle, UK
- Martin Kuiper – Department of Plant Systems Biology, University of Gent, Belgium
- Tamarah Lah-Turnšek – National Institute of Biology, Ljubljana, Slovenia
- Nicolas Le Novère - European Bioinformatics Institute, Cambridge, UK
- Wolfgang Marwan - Max Planck Institute for Dynamics of Complex Technical Systems, Magdeburg, Germany
- Igor Goryanin – Centre for Systems Biology at Edinburgh, UK
- Stig Omholt – Centre for Integrative Genetics, Ås, Norway
- Corrado Priami – Microsoft Research- University of Trento, Italy
- David Rand – Warwick Systems Biology Centre, UK
- Matthias Reuss – Institute of Biochemical Engineering, Stuttgart, Germany
- Joachim Selbig- Max Planck Institute of Molecular Plant Physiology, Golm, Germany
- Jaroslav Stark - Centre for Integrative Systems Biology at Imperial College London, UK
- Bas Teusink - Kluyver Centre, The Netherlands
- Janet Thornton – European Bioinformatics Institute, Cambridge, UK (day 2 only)
- GertJan van Ommen - Center for Human and Clinical Genetics, The Netherlands
- Nikolaus Zacherl – Institute for Medical Genomics Research and Systems Biology (IMGUS), Austria

**Funding organisations**

- Alf Game – Biotechnology and Biological Sciences Research Council (BBSRC), UK
- Steinar Bergseth - The Research Council of Norway (RCN)
- Thomas Bruhn – European Science Foundation, France
- Nicole Firnberg - Federal Ministry for Education, Science and Culture, Austria
- Maïke Heidelberger - Federal Ministry of Education and Research (BMBF)
- Mary Kelly – Science Foundation Ireland
- Oliver Kemper - Federal Ministry for Education, Science and Culture, Austria

- Stefan Lampel - Project Management Juelich (PTJ)
- Frank Laplace – Federal Ministry of Education and Research (BMBF)
- Gabriela Pastori - Biotechnology and Biological Sciences Research Council (BBSRC), UK
- Luc Rietveld - Netherlands Organisation for Scientific Research (NWO)
- Marta Sabec - Ministry of Higher Education, Science and Technology (MHEST)
- Veronika Simons - Project Management Juelich (PTJ)
- Thomas Slagsvold - The Research Council of Norway (RCN)

## **Background**

ERASysBio is an EU funded initiative under the ERA-NET scheme which aims at coordination and cooperation between national programmes for the funding of Systems Biology. ERASysBio is based upon the joint initiative of 12 European member states in order to support transnational R&D co-operations in the field of Systems Biology through coordinating national and regional public funding programmes and horizontal activities. The twelve ERASysBio partners Austria, Flanders (Belgium), Finland, France, Israel, The Netherlands, Norway, Russia, Slovenia, Trento (Italy), United Kingdom and Germany.

The German and British partners of ERASysBio jointly organised this meeting, which primary aims were:

- to identify areas for the development of joint strategies in the context of current and future experimental, computational, technological and socio-cultural challenges;
- to identify areas where collaborations between centres can be established;
- to identify areas where interventions can be applied, indicating the vehicles/mechanisms to implement them.

## **Purpose of the meeting**

The purpose of this meeting was to identify areas of common interest where links between institutions could be maximised and to consider any specific challenges faced by such cooperation. As a general outcome, the organisers expected to identify relevant topics to be considered in the upcoming strategic discussions.

The meeting was targeted exclusively to the heads of established Systems Biology Centers, which 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.

## **Day 1**

Alf Game initiated the meeting with a welcome to all participants. This was followed by a brief introduction to ERASysBio and the purpose of the meeting by Stefan Lampel.

### **Session 1 – Presentation of European Systems Biology Centres**

This session was chaired by Veronika Simons and consisted of a brief roundtable introduction of participants and representatives from funding organizations. This was then followed by a second roundtable, where participants had the chance to introduce their Centres briefly, highlighting major achievements and future goals.

A networking exercise, led by Gabriela Pastori, allowed delegates to introduce themselves and exchange information of relevant research interests in a one-to-one conversation. This exercise was followed by a brief discussion and preparation for day 2.

## **Day 2**

**Presentation** - From infancy to maturity: key steps for the consolidation of Systems Biology in Europe – by Douglas Kell at The Manchester Centre for Integrative Systems Biology, UK

Douglas gave an overview of the origins and philosophy of the systems approach to research and described the data management structure being developed at Manchester. The requirements for data capture, data storage and data integration were discussed and Taverna, incorporating myGrid, was presented as an ingenious way to integrate disparate data from different sources. The system is being tested as a pilot joined-up infrastructure using a systems biology study of growth control in yeast. Douglas concluded that only a distributed workflow architecture can deliver modern systems biology and contribute strongly to the consolidation of this area in Europe.

### **Session 2 – Scientific vision**

This session, chaired by Alf Game, had the aim to identify areas for the development of joint strategies in the context of current and future experimental, computational, technological and socio-cultural challenges. The main points of discussion are summarized below.

#### Communication

Communication barriers between wet-dry scientists seemed to be a common problem to the majority of participants. In addition to incorporating this aspect in training, some emphasised the usefulness of using webcams to facilitate communication between groups on a daily basis.

#### Training

The shortage of trained dry scientists was considered a major bottleneck in the consolidation of systems biology. Participants were informed that the EBI had been developing new teaching tools in the last two years that were proving to work well. The idea was welcomed by participants who thought this could be developed at the undergraduate level.

### Tools

Participants discussed the challenges in developing dry tools, in generating mechanisms to deliver them and in getting the necessary funds to do it. The BBSRC's Tools and Resources Development Fund and Bioinformatics and Biological Resources Fund initiatives were highlighted as examples of funding mechanisms available to the systems biology community.

### Themes

A number of important areas that should constitute the focus in the next few years were discussed. Some examples are listed below.

- Metabolism, ageing and obesity.
- Multiscale modeling, from molecules to organs and model integration: the dynamics of networks are unknown; it is critical how to compare data but also how to compare models.
- Yeast: proposed as the model to work on by a few; this was generally supported but it was thought that the benefits of using this model would take too long to be applied to solving some biomedical challenges.

**Presentation** – ELIXIR, European Life Sciences Infrastructure for Biological Information, by Janet Thornton, European Bioinformatics Institute, Cambridge, UK

Janet presented the mission of this project, which is to construct and operate a sustainable infrastructure for biological information in Europe to support life science research and its translation to medicine and the environment, the bio-industries and society. The project is on the current European Strategic Forum for Research Infrastructures (ESFRI) Roadmap. As part of this project an upgrade to the EBI is foreseen. ELIXIR has a preparatory phase funding award from EU Framework 7, which includes a technical feasibility project to assess European data support needs in systems biology and address the potential role of the EBI.

Following the presentation, Janet suggested that a member of the systems biology community becomes part of ELIXIR.

### **Session 3 – Building on: what can European Systems Biology Centres do together?**

This session, chaired by Steinar Bergseth, had the aim to identify three areas where collaborations between centres can be established, indicating the added value of such collaborations and expected, measurable outcomes. The main topics of discussion are summarised below and listed in priority order.

## **What can Systems Biology Centres do together?**

1. Training and career structure
  - Moving towards a common curriculum at graduate and MSc level
  - Exchange of students and young researchers between Systems Biology Centres
  - PhD and Postdoctoral programmes, such as specialised summer schools
  - Reconsideration of career merit measures and rewards
2. Themes
  - Biomedicine: health nutrition and insulin metabolism
  - Bioenergy and biosustainability
3. Communication, exchange and dissemination
  - model integration
  - development of generic tools
  - communicating systems biology science to the wider community
4. Data management / knowledge management
  - standardization
  - storage
  - management
  - sharing, accessibility, open exchange

## **What is the added value to working together?**

- Emerging knowledge
- Common understanding
- Synergies
- Critical mass
- Stronger Europe

## **What are the expected measurable outcomes?**

- Creation of jobs and qualified workforce
- Mobility of researchers
- Better communication between all concerned
- E-learning tools in Systems Biology

## **Session 4 – Realising the vision: what can ERASysBio do to make it happen?**

The aim of this session was to identify areas where interventions can be applied, indicating the vehicles/mechanisms to implement them.

The discussions were integrated into the previous session.

END

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