ISBE
Infrastructure for Systems Biology in Europe
Background

The amount of detailed data and information on components of living systems continues to increase.

But our ability to understand dynamic interactions within systems remains a challenge.

It has not been possible to tackle these challenges effectively because of:

• Technical limitations
• Limited access to a small number of specialist groups
The Opportunity

This situation is now rapidly changing.
So, it is now timely to develop an infrastructure to co-ordinate the distributed European research effort in Systems Biology.
Mission

Establish and provide access to an integrated, distributed infrastructure of state-of-the-art facilities for systems biology across Europe,

to transform the understanding of life sciences, human health and the environment.
Objective

To enable European life scientists from all sectors to solve complex biological problems with a systems-wide perspective.
Today’s challenges in biomedical research...

- Understanding of **dynamic interactions within systems**
- Increase in detailed **data and information** on components of living systems
- Multiple levels and sources of systems-wide data
Today’s challenges in biomedical research…

- Understanding of **dynamic interactions within systems**
- Increase in detailed **data and information** on components of living systems
- Multiple levels and sources of systems-wide data

... meet opportunities....

- Increased **computer power**
- **New technologies** for data generation, storage, and modelling
- Expertise + technology **distributed** over Europe
ISBE will co-ordinate systems approaches to tackle scientific challenges

- **Foster collaborations:** Data intensive effort distributed over multiple laboratories and disciplines ("-omics", modelling, imaging)

- **Efficiently integrate experimental data and modeling**
  (quality control, standardization, workflows)
Preparatory Phase Objectives:

- Identification of existing activities and consultation with stakeholders regarding the technical requirements of the infrastructure.
- A proposal outlining the recommendations for the technical specifications of the physical infrastructure, required technologies and access policies.
- Development and negotiation of a business plan and sustainable funding model for the construction and operational phase of ISBE.
Landscape of biomedical infrastructures in Europe
ISBE will make best use of synergies with other European infrastructures to link diverse data-sets through systems biology modelling.
Systems Biology Expertise will be structured in centres throughout Europe.
Data Generation Centres
Wide range of high-end expertise and equipment for the generation of integration- and modelling-compatible datasets.

- Microarray technologies
- Sequencing
- Proteomics
- Metabolomics
- Imaging
- Structural biology
Data Generation Centres
Wide range of high-end expertise and equipment for the generation of integration- and modelling-compatible datasets.

Data Stewardship Centres
Expertise in data storage, curation and analysis of different types of datasets; access to published datasets useful for systems biology.
- Databases
- Repositories
- Data standards
- Bioinformatics
- e-infrastructure
- High-capacity data storage
Data Generation Centres
Wide range of high-end expertise and equipment for the generation of integration- and modelling-compatible datasets.

Data Stewardship Centres
Expertise in data storage, curation and analysis of different types of datasets; access to published datasets useful for systems biology.

Data Integration Centres
Expertise in a wide range of computational modelling approaches - integrating diverse datasets into quantitative and predictive models.
Data Generation Centres
Wide range of high-end expertise and equipment for the generation of integration- and modelling-compatible datasets.

Data Stewardship Centres
Expertise in data storage, curation and analysis of different types of datasets; access to published datasets useful for systems biology.

Data Integration Centres
- Biochemical networks
- Gene regulatory dynamics
- Stochastic models
- Continuous approximations
- Metabolic models
- Multi-scale modelling
ISBE will offer:

Access to data + expertise in a network for systems biology approaches
ISBE will offer:

Access to data + expertise in a network for systems biology approaches

...and Training:
Access to web-based training tools and programmes
• Systems Biology is still a developing field

• It is characterised by interdisciplinarity:
  (biologists, mathematicians, physicists, engineers, computer scientists...)

• Thus a less tightly defined field

  opportunity for an interesting community project...
Identifying and engaging the systems biology community to shape ISBE infrastructure according to their needs scientific requirements

ISBE promotes the launch of the European Systems Biology Community web-portal

community.isbe.eu
Community web-site

- **Explore** connections within the community
- Contact experts in **your** fields of interest
- **Communicate** with the community
- Find information relevant to **you**
- Inform the community about **your** favourite events
- And **build** the community of systems biology experts

[community.isbe.eu]
Can edit now (as of today):
- add yourself!
- edit your keywords
- add new institute

Will be able to edit soon:
- papers for your profile
- existing institutes

Resources to be linked over time:
- Modelling resources
- Training information

Need to engage with the community
Correct data depends on YOU!

community.isbe.eu
Get Involved!

We need to know *your* expectations, ideas, etc…

Community web-site

ISBE project web-site

- ISBE mailing list
- Survey
- Direct contact – by e-mail
- Make your Institution an associate partner of ISBE

[community.isbe.eu](community.isbe.eu)  [isbe.eu](isbe.eu)
WP1  Project Management and Coordination  Richard Kitney (IC)
WP2  Model and Data Management  Carole Goble (UNIMAN)
WP3  Infrastructure, Eligibility & Accessibility  Roel van Driel (UvA)
WP4  Data Generation  Dimitris Thanos (BRFAA)
WP5  Community Building  James Sharpe (CRG)
     and Synergies  Jutta Steinkoetter (MDC)
WP7  Strategy, Vision and Advocacy  Vítor Martins dos Santos
WP8  Modelling Infrastructure and Expertise  Stig Omholt (UMB)
WP9  Technology and Science Watch  Rudiger Ettrich (C4SYS)
WP10 Training and Education  Richard Kitney (IC)
WP11 Funding, Governance and Legal  Gabriela Pastori (BBSRC)
WP13 Connections  Hans Westerhoff (VUA)
WP15 Innovation, Impact and Exploitation  Garry Corthals (CBT)
For more information please visit:

www.isbe.eu
For more information please visit:

www.isbe.eu

Or contact the project manager:
Dr. Barbara Skene

b.skene@imperial.ac.uk
ISBE consortium

Imperial College London (IC)
Biotechnology and Biological Sciences Research Council (BBSRC)
University of Manchester (UNIMAN)
Universiteit van Amsterdam (UvA)
Biomedical Research Foundation Academy of Athens (BRFAA)
The National University of Ireland – University College Dublin (NUIDUCD)
Max Delbrück Centrum for Molecular Medicine (MDC)
Turku Centre for Biotechnology (CBT), University of Turku (U. Turku)
Deutsches Krebsforschungszentrum (DKFZ)
Ruprecht-Karls-Universität Heidelberg/ BioQuant Centre -Heidelberg (UHEI)

Universitetet for Miljø og Biovitenskap (UMB)
Centrum vyzkumu globalni zmeny Akademie ved Ceske republiky v.v.i. (C4SYS)
Center for Genomic Regulation, Barcelona (CRG)
National Institute of Biology – Slovenia (NIB)
Univerza v Ljubljani (UL)
EMBL-European Bioinformatics Institute (EMBL-EBI)
University of Gothenburg (UGOT)
Wageningen University and Research (WU-ATV)
HITS GmbH (HITS)
Stichting VU-Vumc (VUA)
Chalmers University of Technology
Netherlands Organisation for Scientific research – Earth and Life Sciences (NWO)
Ministrstvo za izobraževanje (MIZS)