Towards an EU cardiac simulation network / feltwork /working group

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- what do we want?
- what is available now?
- what are the opportunities and deadlines?

what do we want?

- carry on independently, but have semiregular meetings?
- develop a feltwork of organic collaborations?
- produce a graduate text?
- have an ambitious mission or a simple objective?
- evolve into a working group?

what is available now?

- WUN
- BioSim

Worldwide Universities Network

- *The WUN member institutions are:*

  University of Bergen; Pennsylvania State University; University of Bristol; University of Sheffield; University of California-San Diego; University of Southampton; University of Illinois-Urbana Champaign; Universiteit Utrecht; University of Leeds; University of Washington – Seattle; University of Manchester; University of Wisconsin-Madison; Nanjing University; University of York; University of Oslo; Zhejiang University

pump-priming

- University of Leeds seeks to engage Leeds academics in *new* international collaborations, opening up novel areas of research, deepening collaborative partnerships, and encouraging applications and submissions for third party support for international research collaborations. WUN participation strongly advised.
- Deadline: 1000 word application by Nov 30th
- ? workgroup meeting next Spring to sketch out FP7 application?

Life Science July 2007

- Joint meeting of UK Physiological, Biochemical and Pharmacological societies
- Symposium: 4 invited speakers, average £1300 travel
- Jan 2006 deadline for submitting a proposal
- ? systems biology of ventricular fibrillation???

BioSim

- funded NoE till 2009, with 24 academic, 10 industrial, and 4 regulatory partners
- cardiac arrhythmia workpackage
- have 24 person-month incoming young scientists
- exclusive, but can collaborate.

http://chaos.fys.dtu/biosim

The European 7th Framework Programme (FP7)

Philippe Jehenson, MD, BSc, PhD

Principal Scientific Officer
Biotechnology and Applied Genomics
Directorate Health
Research Directorate General

European Commission

BIOSIM

Mallorca, Oct 2005

Areas of some EU CB/SB projects

ATD	**Alternate transcript**
BioBabel	**Ontologies**
BioMinT	**Text mining, curation**
BioSapiens	**Genome Annotation, School**
BIOSIM	Biosimulation - A new tool in Drug development
COMBIO	**P53-MDM2 Spindle SB**
COSBICS	**Signalling SB**
DIAMONDS	**Cell cycle, yeast-human SB**
EBioSci	**Data mining, literature search**
EMBRACE	**Bioinformatics Grid**
EMI-CD	**SB models-complex disease**
ENFIN	**Bioinformatics basis for SB modelling**
ESBIC-D	**SB of cancer-patients**
YSBN	**SB of yeast cells**
TEMBLOR	**Integr, Array Express, Protein-protein, structure**

Total EC support: 77 M€ (of which BIOSIM: 10.7 M€)

Planning for FP7
Systems Biology Workshop

- **Organised in Brussels (European Commission), 8 Dec 2004 by Philippe Jehenson and Frederick Marcus**

- **11 Participants (project participants):** Ewan Birney, Andrea Ciliberto, Morten Colding-Jørgensen, Albert Goldbeter, Stefan Hohmann, Martin Kuiper, Hans Lehrach, Gisela Miczka, Erik Mosekilde, Hans Westerhoff, Olaf Wolkenhauer.

- **Outcome:**
  - Interactions, exchange of information between projects / participants
  - **Report** : www.cordis.lu/lifescihealth/genomics/home.htm

ftp://ftp.cordis.lu/pub/lifescihealth/docs/systems_biology_worskhop_report_jan2005.pdf

Key future areas for Systems / Computational biology

Participants in current EU projects have identified key areas for the future (see workshop reports):

- **GENERAL SYSTEMS BIOLOGY APPROACHES AND TOOLS**

SB within other projects; Areas for analysis; Types of Analysis; Methodologies; SB Data Integration Packages, various types of Modelling.

- **UNDERPINNING BIOINFORMATICS, EXPERIMENTAL SUPPORT**

Bioinformatics, Databases, Software, Access, Services, Research and Life Sciences Infrastructures as the basis for systems biology:

Model systems, Biobank Resources, Standards, Ontologies, obtaining data, going beyond present 'omics', maintaining, expanding databases

- **TOPICAL AREAS FOR SYSTEMS BIOLOGY**

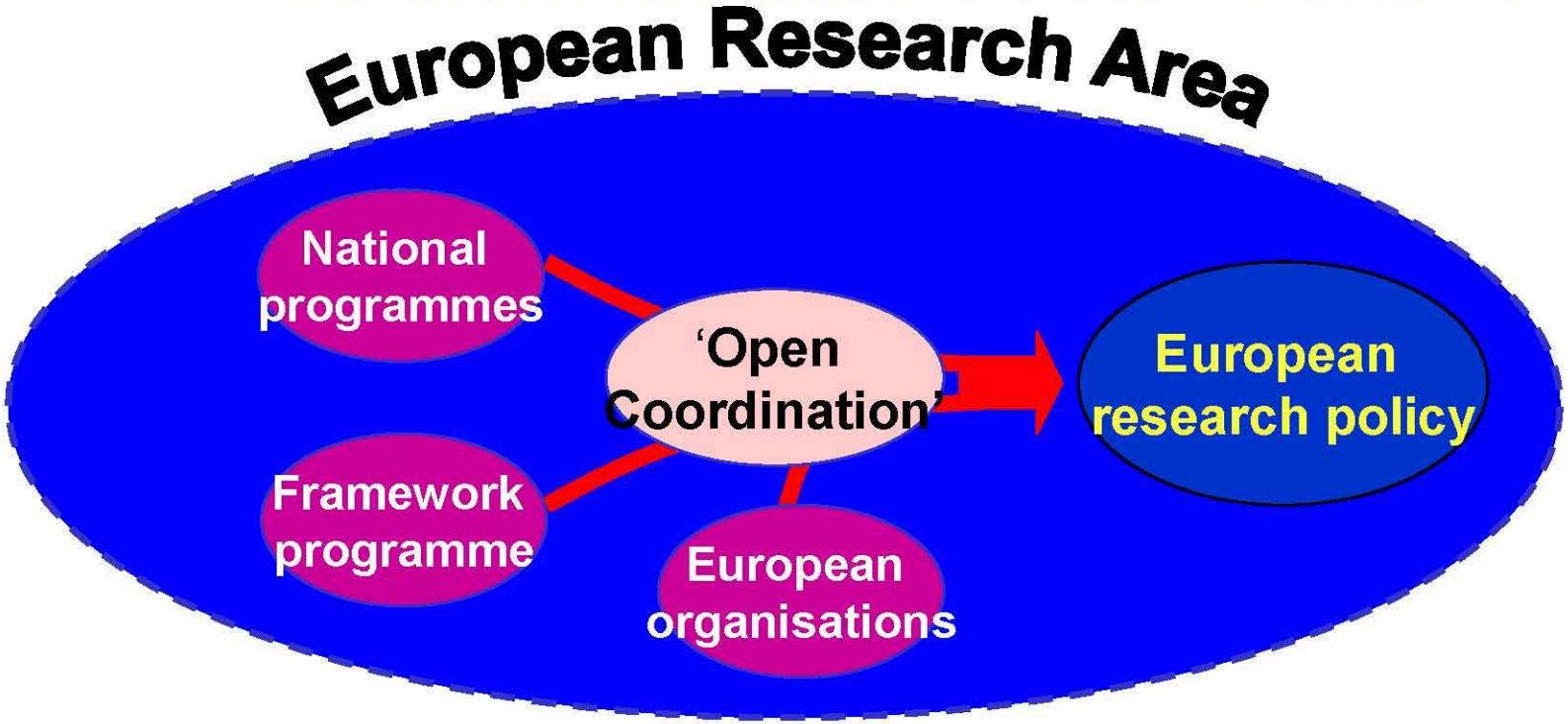
- Developing systems biology : Cellular and sub-cellular systems; Efficient large-scale study of multiple interacting systems at the cellular and physiological levels; Physiology;

- Applying systems biology: Disease, Medicines, Treatment, Biotechnology, New Applications

- Training

The European Research Area

- A joint effort by EU and Member States to address structural deficits in European research
  - **Fragmentation**
  - **Under-resourcing**
  - **Unfavourable environment for research and innovation**



FP7

Building the Europe of Knowledge

Proposals for the 7th Research Framework Programme 2007 - 2013

http://europa.eu.int/comm/research/future/index_en.cfm

Perspectives for Health research in FP 7

- **Budget increase** from € 600 M/year to € 1.2 Billion/year
- **Collaborative research** to continue
- **Joint Technology Initiative for Innovative Medicines**

Specific Programmes

Cooperation **– Collaborative research**

Ideas **– Frontier Research**

People **– Human Potential**

Capacities **– Research Capacity**

+

JRC (non-nuclear)

JRC (nuclear)

Euratom

Cooperation – Collaborative research

9 Thematic Priorities

1. Health
2. Food, agriculture and Biotechnology
3. Information and Communication Technologies
4. Nanosciences, Nanotechnologies, Materials and new Production Technologies
5. Energy
6. Environment and climate change
7. Transport
8. Socio-Economic Sciences and the Humanities
9. Space and Security research

Theme 1: HEALTH

Objective

Improving the health of European citizens and increasing the competitiveness of European health-related industries and businesses, while addressing global health issues including emerging epidemics. Emphasis will be put on translational research (translation of basic discoveries into clinical applications), the development and validation of new therapies, methods for health promotion and disease prevention, diagnostic tools and technologies, as well as sustainable and efficient health care systems.

Theme 1: HEALTH

Biotechnology, generic tools and technologies for human health

This activity aims at developing and validating the necessary tools and technologies that will make possible the production of new knowledge and its translation into practical applications in the area of health and medicine.

- **High-throughput research**
- **Detection, diagnosis and monitoring**
- **Innovative therapeutic approaches and interventions**
- **Predicting suitability, safety and efficacy of therapies**

Theme 1: HEALTH

Biotechnology, generic tools and technologies for human health

Detection, diagnosis and monitoring

to develop visualisation, imaging, detection and analytical tools and technologies for biomedical research, for prediction, diagnosis, monitoring and prognosis of diseases, and for support and guidance of therapeutic interventions. The focus will be on a multidisciplinary approach integrating areas such as: molecular and cellular biology, physiology, genetics, physics, chemistry, nanotechnologies, microsystems, devices and information technologies. Non- or minimally- invasive and quantitative methods and quality assurance aspects will be emphasised.

Theme 1: HEALTH

Biotechnology, generic tools and technologies for human health

Predicting suitability, safety and efficacy of therapies

to develop and validate the parameters, tools, methods and standards needed for bringing to the patient safe and effective new biomedicines (for conventional medicines, these issues will be addressed through the proposed Joint Technology Initiative on Innovative Medicines). The focus will be on approaches such as pharmacogenomics, in silico, in vitro (including alternatives to animal testing) and in vivo methods and models.

Theme 1: HEALTH

Translating research for human health

This activity aims at increasing knowledge of biological processes and mechanisms involved in normal health and in specific disease situations, to transpose this knowledge into clinical applications, and to ensure that clinical data guide further research.

- **Integrating biological data and processes: large-scale data gathering, systems biology**
- **Research on the brain and related diseases, human development and ageing**
- **Translational research in major infectious diseases: to confront major threats to public health**
- **Translational research in other major diseases (Cancer, Cardiovascular disease, Diabetes and obesity, Rare diseases, Other chronic diseases)**

Theme 1: HEALTH

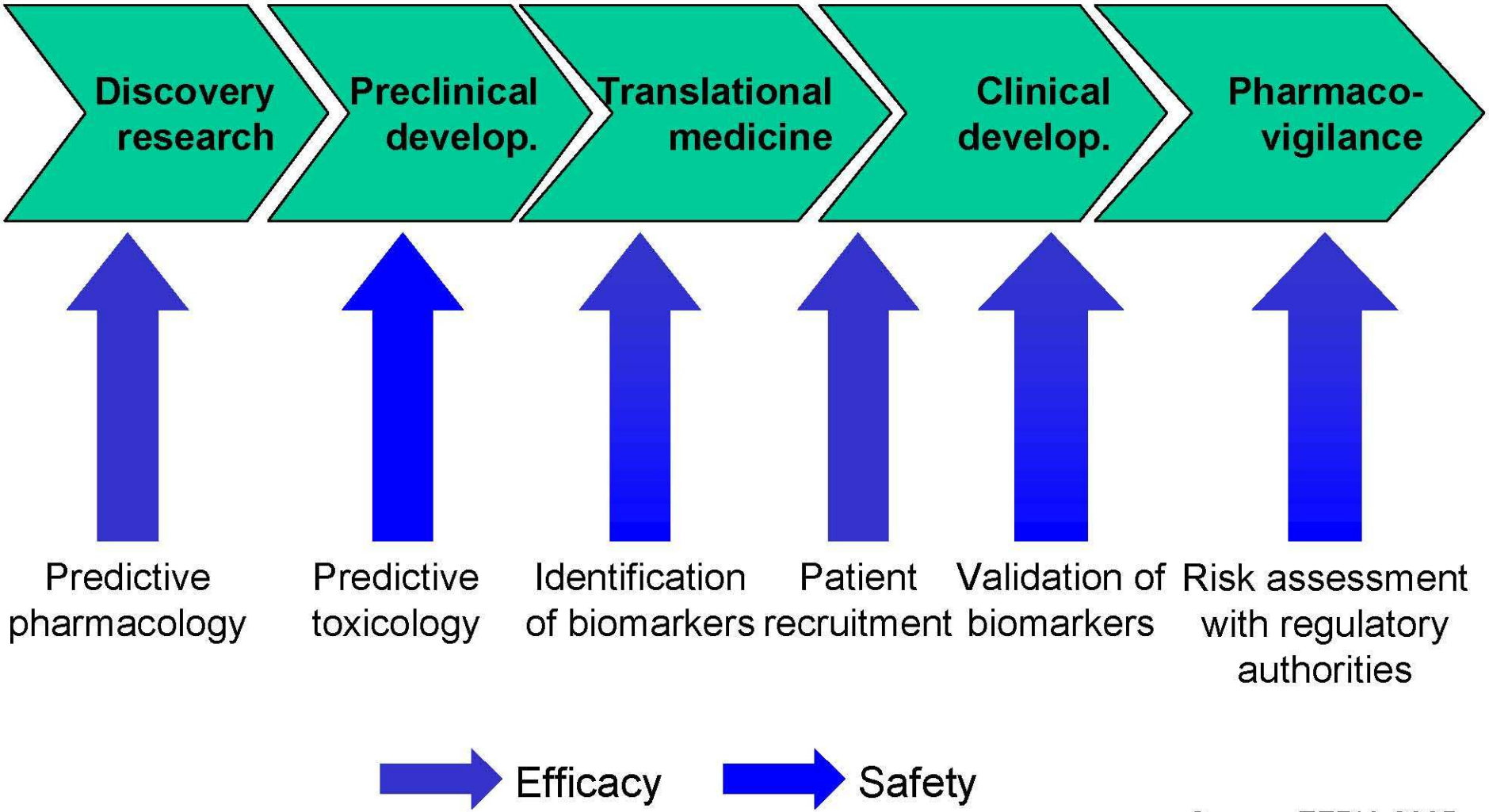
Translating research for human health

Integrating biological data and processes

- **Large scale data gathering: to use high-throughput technologies to generate data for elucidating the function of genes and gene products and their interactions in complex networks. The focus will be on: genomics; proteomics; population genetics; comparative and functional genomics.**

- **Systems biology: the focus will be on multidisciplinary research that will integrate a wide variety of biological data and will develop and apply system approaches to understand and model biological processes.**

R&D bottlenecks



Source: EFPIA 2005

Innovative Medicines Initiative

address R&D bottlenecks in 4 main areas:

- Improved prediction **– early indications of safety.**
- Improved clinical performance **– early indications of efficacy by use of biomarkers.**
- Better knowledge management **through collaboration – breaking information barriers at the interfaces.**
- Education and training: **leverage strengths and bridge gaps – pre-clinical and clinical research – and breaking barriers between disciplines.**

Tentative Timetable (FP7)

(Decision on Financial Perspectives)

2005

6 April	Commission - Adoption of FP7 proposals
21 Sept	Commission - Adoption of SPs proposals (pdf here)
Oct	Rules for participation and dissemination
Late	Commission – Proposals under Articles 169 and 171 Executive Agencies
Dec	EP – First reading

2006

Jan	Council – Common position
Mar	EP – Second reading
Apr	EP – Opinion on the SPs
Jun	Council and EP – Adoption of FP and Rules
Jul	Council – Adoption of the SPs
Nov	Publication of first calls for proposals