Modeling Tools for Pharmacokinetics and Systems Medicine

A SYSTEMS MEDICINE HANDS-ON TUTORIAL FOR MEDICAL DOCTORS AND
OTHER SCIENTIST

6 EACCME credits

Stuttgart, Germany
Sunday, May 18, 2014, 9 – 16:45
CASyM Coordinating Action Systems Medicine Europe

Prof. dr. Damjana Rozman
On behalf of the CASyM Consortium
What is CASyM?

CASyM
Coordinating Action Systems Medicine - Implementation of Systems Medicine across Europe

Launched by the EC under the FP7 programme
Preparing for the future research and innovation activities in systems medicine.

Administrative office (coordination)
Dr. Marc Kirschner, Project Management Jülich (PtJ), Forschungszentrum Jülich GmbH, Germany

Duration
4 years - 1 November 2012 – 30 October 2016

Budget
2.9 Mio €
What is CASyM?

CASyM will provide a European wide implementation strategy (road map) for Systems Medicine

► The road map is driven by clinical needs: It aims to identify areas where a systems approach will address clinical questions and solve clinical problems.

The vision of CASyM

Harnessing the advances in biology, computational biology and Systems Biology for the benefit of the patient.
Why Systems Medicine?

The post-genome wave combined with in-depth mathematical approaches changed the perspective of understanding human health and disease but this has not been sufficiently explored in medicine.

Complexity of human chronic multifactorial diseases, that combine with aging, urges to broaden the pool of researchers in the medical sciences that apply quantitative techniques and systems approaches.

New generations of medical doctors and researchers can fully accomplish such tasks, by being exposed to systems approaches as early as possible in their education or research paths.

The systems approaches facilitate early intervention, anticipation and/or prevention, and aid in development of safer and more efficient personalized treatments.

CASyM training of the next generations will contribute towards reduction of chronic disease-related healthcare costs.
Paradigm shift: Towards a new generations of MDs and scientists that are trained within the three pillars of systems medicine: laboratory, computing, clinics

and apply this in daily practice to improve prognosis, diagnosis and treatment regimens of multifactorial chronic diseases.
22 PARTNERS & 11 COUNTRIES:

GERMANY
UNITED KINGDOM
FRANCE
SWEDEN
LUXEMBOURG
NETHERLANDS
SLOVENIA
IRELAND
ICELAND
ISRAEL
ITALY
New “Systems” initiatives in Europe

- ERASysAPP
- CASyM
- ISBE
- And many others
Work packages of CASyM

WP1 - Conceptual framework for the Systems Medicine road map: Stakeholders, target areas, structure, integration

WP2 - Education & multidisciplinary training: Training concepts, workshops, summer schools, CPD courses

WP3 - Technological and methodological basis: Clinical relevant questions

WP4 - Strengthening innovation activities: Fostering “win-win” academia-industry relationships

WP5 - Integration of national efforts: Implementation of relevant funding schemes

WP6 - Dissemination: Central website, publications, publicity, sustainability

WP7 - Management: Administrative management
Challenge: Science can produce more patients data than ever before.
Vision: Systems medicine allows most efficient data usage

Evidence & data → Multidimensional inputs → Computational models → Improved diagnostics & therapies

- Pathway literature
  - Pathway mapping
  - Patients' samples

- Clinical literature
  - Clinical samples

Multidimensional inputs:
- Omic profiles
- Signalling networks
- Clinical data

Computational models:
- Patient stratification
- Prognosis
- Therapy response

Improved diagnostics & therapies:
- Virtual patients
- Personalised diagnostics
- Personalised therapies

Validation

Challenge:
Science can produce more patients data than ever before.

Vision:
Systems medicine allows most efficient data usage.
Vision:
Systems Medicine Approaches can provide the Heads-Up-Display that allows the clinician to navigate patients’ data for making optimal decisions about diagnosis and therapy.
How will CASyM contribute to this vision?

- CASyM will develop a road map for the implementation of Systems Medicine.
Join CASyM and work with us on the future of healthcare & medicine!

www.casym.eu
Organization and support

The CASyM Steering Committee

Charles Auffray - European Institute for Systems Biology & Medicine - EISBM, France
Mikael Benson (Deputy Speaker) - Linköping University Hospital, Sweden
Rob Diemel - The Netherlands Organisation for Health Research and Development, The Netherlands
David Harrison (Speaker) - University of St. Andrews, United Kingdom
Walter Kolch - University College Dublin, Ireland
Frank Laplace - Federal Ministry of Education and Research, Germany
Francis Lévi - Institut National de la Sante et de la Recherche Medicale, France
Damjana Rozman (Deputy Speaker) - University of Ljubljana, Faculty of Medicine, Slovenia
Johannes Schuchhardt - MicroDiscovery GmbH, Germany
Olaf Wolkenhauer - Dept. of Systems Biology & Bioinformatics University of Rostock, Germany

Administrative office (Coordination)

Marc Kirschner – Forschungszentrum Jülich, Project Management Jülich (PtJ), Gemany

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Missiosk

Developing a strategic road map for the European wide implementation of Systems Medicine

Key features
- Integration
- Interaction
- Community building
- Clinical needs

Further information
www.casym.eu

Contact
m.kirschner@fz-juelich.de

Join CASyM and work with us!
**Tobias Kanacher** (Leverkusen, Germany)
An introduction to physiology-based pharmacokinetic (PBPK) modeling

**Hans V Westerhoff** (Amsterdam, NL and Manchester, UK)
Truly individualized systems medicine: a hands-on tutorial where participants will resolve paradoxes by using virtual twin/digital-me

**Francis Lévi** (Villejuif, France), **Annabelle Ballesta** (New York, USA)
Systems cancer chronotherapeutics for the personalization of cancer treatments

**Ales Belic, Jure Acimovic, Damjana Rozman** (Ljubljana, Slovenia)
Feedback mechanisms and systems medicine: Modelling cholesterol homeostasis for drug discovery