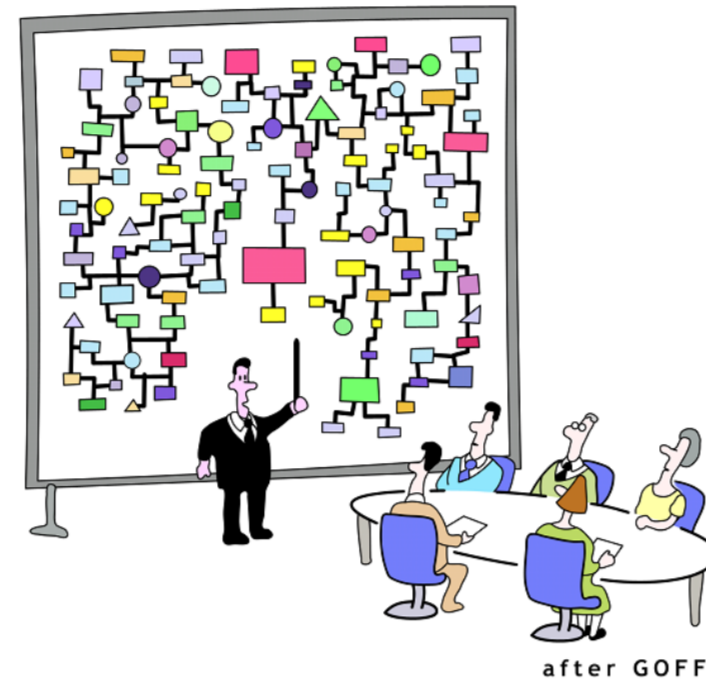


Systems Biology & Bioinformatics Research group

Who are we?

We are an interdisciplinary and international team specialising in the analysis of complex dynamical systems in the life sciences.

We develop generally applicable mathematical and statistical methods with a focus on probably the most complex form of all systems: "the living systems". Just as we need tools to visualize the phenomena in experiments, so we need mathematical models to understand complex relationships.



"Thanks to systems biology, we now have a clear picture of complex diseases."

Systems Biology and Bioinformatics

Major areas of bioinformatics are the organization, integration and statistical analysis of biological data. In contrast, systems biology involves using methods of dynamical systems theory to explain the behaviour of cellular processes.

*Mathematics is the long arm of common sense
and thus inseparable from the craft of science.*

Achievements & experience

- We founded the first international journal in the field of systems biology.
- We developed new methods for analyzing nonlinear dynamic systems to identify characteristic features in the field of cell communication.
- We established and validation of these tools by means of biochemical, biological and biomedical experiments.
- Development of an abstract multilevel model of a cell to demonstrate the self-organization of living systems in a formal example (2007).
- First application of the so-called "power-law representations" to cellular signalling pathways and successful application to experimental data (2008).
- Development of the 'two-moment approach' in the field of stochastic modelling; Our investigation of the cell cycle with this approach show an agreement with experimental data that has not been achieved before (2009).
- Editorship of the 'Science Policy Briefing' 35 of the European Science Foundation (ESF) for Systems Biology in Medical Applications (2009).
- Organization of Conference on Cancer System Biology (CaSysBio 2009), funded by the European Commission, the National Cancer Institute of the USA and the BMBF.

*A complete list of publications is available on our homepage:
www.sbi.uni-rostock.de*

Projects and networks

We work on a number of projects on various biological systems, and yet all the projects have one common question:

*What are the principles that govern the interactions
of molecules and cells and thus determine its dynamic behaviour?*

We concentrate on the three basic processes of gene expression, metabolism and cell communication. The applications of our research are diverse. Currently, we are working on projects in the following areas:

- Cancer Research
- Aging
- Biotechnology
- Biodosimetry
- Photorespiration
- Systems Theory

*A complete list of research activities is available on our homepage:
www.sbi.uni-rostock.de*

We cooperate in research and teaching with institutes "around the world" including:

- Case Western Reserve University, Cleveland, USA
- Stellenbosch Institute for Advanced Study, South Africa
- Korean Advanced Institute of Science & Technology, South Korea
- Bulgarian Academy of Sciences, Bulgaria



A home for bright minds

We offer courses on data analysis, modelling and simulation with applications in life sciences. We teach the necessary theoretical background and provide practical examples as well. The courses are designed for students from different disciplines/backgrounds:

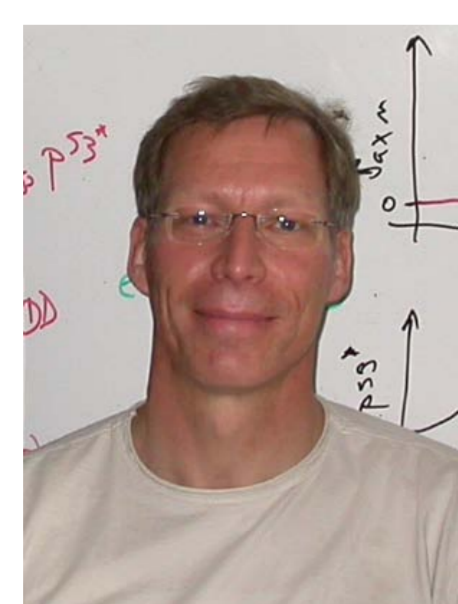
- Modelling and Simulation with Application to the Life Sciences
- Biosystems Modelling and Simulation
- Complex Software Systems: Data Integration, Mining, Visualisation
- Proseminar, Research seminar

Furthermore we offer:

- Participation in current research projects as a student assistant or as part of bachelor's, master's or diploma, not only for computer scientists
- Research/industrial placements abroad
- Integration in an international team of computer scientists, mathematicians, engineers, physicists, biologists and biochemists
- Entry into an international research environment with excellent job prospects in industry and academia

If you are interested in joining us, feel free to visit us!

Group leader: Professor Olaf Wolkenhauer



- 1997: PhD on 'Possibility Theory with Applications to Data Analysis', Control Systems Centre, UMIST, Manchester, U.K.
- 1999-2000: Senior Research Fellow in Technical University of Delft, Netherland.
- 2002: Senior Lecturer in the Dept. of Biomolecular Sciences and the Dept. of Electrical Engineering and Electronics, University of Manchester, Institute of Science & Technology, U.K.
- 2003: Appointed to the University of Rostock. The first chair in Systems Biology in Europe.
- 2003-2006: Visiting professor in the School of Mathematics, University of Manchester, U.K.

- Founder of the first international journal in the field of systems biology.
- Since 2004, Adjunct Professor at Case Western Reserve University, Cleveland, USA
- Since 2005, Fellow of Stellenbosch Institute for Advanced Study (STIAS).
- 2008: Editor of Science Policy Briefing 35 of the European Science Foundation on Medical Applications of Systems Biology.
- Since 2009, Adjunct Professor at the Centre for Integrative Genetics, Norwegian University of Life Sciences in Ås, Norway.
- 2009: 'SPIE Pioneer Award' of the 'International Society Advancing light-based research'.