Life Sciences
Newsletter 14
Soft Matters
October 2011

New ISF Ralf Reski: *e:MOSS*

Ralf Reski joined the School of LifeNet as ISF in October 2011. Reski, a trained biologist and chemist completed his PhD in Genetics (Hamburg, 1990), and during his post-doc period was awarded a DFG Heisenberg Fellowship. In 1999 Reski became full professor and head of the newly established Department of Plant Biotechnology in Freiburg. He also is PI at the Spemann Graduate School of Biology and Medicine (SGBM), the Excellence Cluster BIOSS and the BMBF funded Freiburg Initiative for Systems Biology (FRISYS).

As guest professor Reski is affiliated with the Ecole supérieur de Biotechnologie Strasbourg (ESBS). He is member of the Supervisory Board of BioPro GmbH, an enterprise of the federal state of Baden-Württemberg and was a member of the Think Tank on Innovation Policy headed by Günther Oettinger, the state Premier of Baden-Württemberg and now European Commissioner. Furthermore in 2008 Reski was voted President of the Deutsches Nationalkomitee Biologie (DNK).

His research focuses on the genetics, proteins, metabolism and peculiarities in the cell development of mosses. His work (150 publications and 14 patent applications) has been a significant factor in the establishment of *Physcomitrella patens* (moss) as a widely used model organism to study plant development. Following the deciphering of the *Physcomitrella patens* genome in 2008, Reski established the International Moss Stock Center (IMSC) in 2010, which stores and distributes moss strains, transgenics and ecotypes.

Reski's FRIAS project "Engineering Moss (e:MOSS)" is carried out in collaboration with Jens Timmer and ESF Nir Ohad. The aims are to understand cellular differentiation, pattern formation and early development in the moss *Physcomitrella patens*.

LifeNet Scientists continuously successful in obtaining BMBF grants - the *e:Bio Initiative*

The Federal Ministry of Education and Research (BMBF) recognized the potential of systems biology at an early stage and introduced further Systems Biology initiatives to address this area.

LifeNet scientists were already successful in Competence Networks (like Hepatosys and Virtual Liver), set up in 2004, and Research Units for Systems Biology (FRISYS, 2007). More recent funding measures in which LifeNet Fellows were successful specifically focused on mathematical modelling for biomedical research (MedSys, 2009, Gerontosys I & II, 2010 and 2011, CancerSys, 2011).

Now the BMBF started to pool activities in systems biology under the brand of "e:Bio - Innovations Competition Systems Biology" which aims at further strengthening Germany's position as a leading location for systems biology.

In this initiative four FRIAS projects have been selected by the referees out of 170 proposals: "*SBEpo - Systems Biology of Erythropoietin*" (Jens Timmer, Hauke Busch/Melanie Börries), "*ReelinSys - Systems biology of Reelin-associated neuropsychiatric disorders*" (Jens Timmer), "*RNAsys Systems biology of RNA*" (Jens Timmer) and "*BioSystems analysis of microspores to improve industrial plant embryo production*" (Klaus Palme, Hauke Busch/Melanie Börries, Bob Murphy).

New JF Maria Asplund: *Conducting polymers for neural interfaces*

In October 2011 Maria Asplund started her Junior Fellowship at the FRIAS School of Soft Matter Research.

Asplund studied Applied Physics and Electrical Engineering at the University of Linköping, Sweden (1997-2003). Until 2009 she continued with a PhD project at the Royal Institute of Technology (KTH), Stockholm, focussing on conjugated conducting polymers as a means to improve neural interfaces.

Following the PhD, Asplund continued to work as a Senior Researcher at the KTH. She is a member of the Centre for Organic Bioelectronics (OBOE) since 2005, funded by the Swedish Foundation for Strategic Research.

Asplund's work at FRIAS focusses on modifications of neural implants by conducting polymer technology. The aim is to investigate the performance of polymer materials in a medical environment. The work is carried out in collaboration with Professor Thomas Stieglitz at IMTEK Freiburg.

ISF Ingo Krossing receives ERC Advanced Grant

Ingo Krossing, Chair of Molecular and Coordination Chemistry and ISF at the School of Soft Matter Research, will receive a European Research Council (ERC) Advanced Grant for his project "*Unifying Concepts for Acid-Base- and Redox-Chemistry*". Krossing was judged to have an outstanding track record and made major contributions to chemistry of highly reactive cations. The referees concluded that he presented a highly innovative proposal focusing on the development of a unifying concept combining an absolute scale of Brønstedt acidity and an absolute scale of redox potentials.

Joint FRIAS - South African Council for Scientific and Industrial Research (CSIR) workshop on new diagnostic tools for infectious diseases

Low-cost and reliable diagnostic tests are urgently needed in the developing world and today microsystems play a pivotal role in nearly every new diagnostic device developed. From September 7-11, 2011 the first International Workshop on Microsystems Technologies for African Health took place in Nelspruit, South Africa - right at the center of a rural area where tropical infectious diseases like AIDS, malaria and tuberculosis are a major problem. Here clinicians met engineers and formulated the need for new easy-to-handle, reliable, and affordable diagnostic tools.

The presentations by micro-engineers, chemists, physicists and biochemists focused on microsystems devices, microfluidics and lab-on-a-chip technology suitable for diagnostics in underdeveloped regions.

Many competing technologies were described that could all be, or have been, applied to HIV/AIDS, TB or malaria testing.

The Micro-Med Organisation Team

This unique workshop stimulated far reaching discussions amongst the delegates. As a consequence the researchers believe that out of their newly founded scientific collaborations more focused research projects will evolve that may have a positive impact for the disease burden in Africa.

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New ISF Margit Zacharias: *Inorganic-organic Interfaces on the Nanoscale*

In October 2011 Margit Zacharias joined the FRIAS School of Soft Matter Research as ISF. Zacharias studied Physics at the University of Leipzig. She received her PhD in Electrical Engineering (1984) and her habilitation in Experimental Physics from the University of Magdeburg in 1999.

She joined the Max Planck Institute of Microphysics (Halle) in 2000 where she established and led the Nanocrystals and Nanowires Group. In 2006 she moved to the University of Paderborn as a professor for Applied Physics. In 2007 she was appointed professor at the University of Freiburg, Institute of Microsystems Engineering (IMTEK), Laboratory for Nanotechnology.
Her research interests cover the development of new materials based on nanocrystals and nanowires and their applications. Low cost nanostructuring methods, nanotemplates and the deeper understanding of the interaction and functionalisation of nanomaterials for optics, sensorics and photovoltaics are the focus of her research.

Capri Autumn School 2012 on Photosensitive Processes

From September 19-23, 2011 the School of Soft Matter Research held an Autumn School for PhD students and Postdocs on Capri, Italy, on the topic *Photosensitive Processes in Nature and Technology*. The idea was to bring together scientists studying the primary steps of photosynthesis in biological systems with researchers from the field of dye and organic solar cells.
The school had five working days and provided lectures covering theory and experiments for natural and artificial light harvesting systems. Each lecture comprised of four full hours delivered on two consecutive days. For the four hour courses the School could attract Bernard Kippelen (Georgia Tech), Jenny Nelson (London), and Rienk van Grondelle (Amsterdam). Although the topics were rather broad the 35 young scientists enjoyed the school tremendously – not only because of the Italian setting but primarily because of the high quality of lectures and the broad overview over many aspects of photosynthesis they could gather within this week.
Furthermore, the intimate atmosphere of the venue *Villa Orlandi* and the small island clearly helped to create a group feeling and encourage lively discussions.

EVENTS TO COME

December 8, 2011
FRIAS Seminar with Francesco Rao: "*Rethinking the dynamics of biomolecules"*
13:15h FRIAS, Albertstr. 19, Freiburg

March 5-8, 2012
7th International conference on *Nano/Micro Engineered and Molecular Systems* (NEMS2012)
Kyoto/Japan
Registration required.

March 14-18, 2012
Black Forest Focus on Soft Matter 7: *"Multidimensional Optical Spectroscopy and Imaging: Temporal and spatial resolution at the cutting edge",* Saig/Titisee
Registration required

www.frias.uni-freiburg.de/softmatter-events

Integrative 'omics' approaches to disease mechanism – From emerging technologies to new perspectives

The conference *"Integrative 'omics' approaches to disease mechanism – From emerging technologies to new perspectives"* was held from October 9-11 in the picturesque town of Munzingen.
Proteomics, metabolomics, genomics, transcriptomics and systems biology, all of them state-of-the-art disciplines, were represented at this meeting. Their origins date back only one or two decades and they all offer promising perspectives for human health.
Experts in the respective fields highlighted breakthroughs in their research leading to a more comprehensive understanding of a broad range of diseases like cancer, diabetes, Huntington' s disease, among many others.
Another aspect treated therein was the employment of these new techniques for early detection of pathologies without the need to resort to invasive diagnostic methods.
The speakers' presentations covered more than the biological aspects of scientific investigations. More general topics were also discussed activating the audience to review biochemical research from a different perspective. Questions were raised on the need for unified criteria and qualified professional input. Further discussions dealt with other epistemological aspects underlying research on complex biological systems and the participants were encouraged to reconsider the whole philosophy of systems biology. A simple question asked by Y. Lazebnik, whether a biologist could fix a radio, created a relaxed atmosphere for a spirited debate.

EVENTS TO COME

December 1, 2011
FRIAS Seminar with Carl Blobel: *"Role of ADAM17/EGFR and ADAM10/Notch signaling in angiogenesis"*
13:15h FRIAS, Albertstr. 19, Freiburg

December 15, 2011
FRIAS Seminar with Jan Riemer: *"Oxidative folding and redox regulation in mammalian mitochondria"*
13:15h FRIAS, Albertstr. 19, Freiburg

January 19, 2012
11th Hermann Staudinger Lecture with Nobel Laureate Werner Arber: *"From Microbial Genetics to Molecular Genetics and to Molecular Evolution"*
16:15h Anatomy Lecture Hall, Albertstr. 19, Freiburg

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