

Mechanobiology: Opportunities for Interdisciplinary Research from Molecules to Tissues

Seminar room of the University Hospital RWTH Aachen; November 26, 2015

Mechanobiology is an emerging research field combining mechanical and biological analyses to understand how cells sense and respond to mechanical stimuli. Mechanobiology aims at describing quantitatively the acting forces and how they act at the molecular, the cellular and the tissue level. The understanding of these mechanisms will help to treat diseases such as atherosclerosis, asthma, heart failure or cancer. Mechanobiology brings together competences from engineering, natural and medical sciences. At RWTH Aachen University the two interdisciplinary projects ERS Boost-Fund "MechCell" and IZKF "Mechanobiology" work on research topics related to the mechanobiological control of cell functions and cell differentiation.

The colloquium will present our current research activities by oral and poster contributions. Three internationally renowned key speakers will complement the overview of the growing research topic mechanobiology.

We cordially invite you to attend the colloquium and contribute to the stimulation of new ideas and corporations across disciplines. Poster contributions are welcome.

Stefan Uhlig, Dean of the Faculty of Medicine

Uwe Schnakenberg, Institute of Materials in Electrical Engineering 1

Brigitte Küppers, ERS-Forum

PROGRAMME

10:30-11:00	<i>Registration - Coffee</i>
11:00-11:20	Stefan Uhlig , Dean of the Faculty of Medicine: <i>Welcome and Opening - Mechanobiology at RWTH Aachen University</i>
11:20-11:40	Rudolf Merkel , Institute of Complex Systems - Biomechanics (ICS-7), Forschungszentrum Jülich <i>Mechanosensitive reactions of living cells</i>
11:40-12:00	Uwe Schnakenberg , Institute of Materials in Electrical Engineering 1, RWTH Aachen University <i>Electrodes in stretchable substrates for the characterization of cells</i>
12:00-12:40	Florian Rehfeldt , 3 rd Institute of Physics - Biophysics, Georg-August-University Göttingen Keynote 1: <i>Matrix mechanics matters for stem cells: impact on cytoskeleton and the nucleus</i>
12:40-14:00	<i>Poster-Lunch</i>
14:00-14:20	Bernd Markert , Institute of General Mechanics, RWTH Aachen University <i>Advances in mechanobiological bioreactor systems</i>
14:20-14:40	Andreas Ludwig , Institute of Pharmacology and Toxicology, University Hospital RWTH Aachen <i>Regulation of endothelial surface molecules by shear stress</i>
14:40-15:20	Joachim Spatz , Max Planck Institute for Intelligent Systems, Stuttgart Keynote 2: <i>Geometric and mechanical material constraints guide collective cell migration</i>
15:20-16:00	<i>Coffee Break & Poster</i>
16:00-16:20	Rudolf Leube , Institute of Molecular and Cellular Anatomy, University Hospital RWTH Aachen <i>Analysing mechanical properties of the epithelial cytoskeleton</i>
16:20-16:40	Horst Fischer , Dental Materials and Biomaterials Research, University Hospital RWTH Aachen <i>Mechanobiological challenges of cell-laden hydrogel 3D-bioprinting</i>
16:40-17:20	Georg Duda , Julius Wolff Institute, Charité - Universitätsmedizin Berlin Keynote 3: <i>Mechano-biology in regeneration</i>
17:20-20:00	<i>Get-together</i>