GEORG-AUGUST-UNIVERSITÄT GÖTTINGEN

UMG UNIVERSITÄTSMEDIZIN GÖTTINGEN

Max-Planck-Institut für Dynamik und Selbstorganisation

SFB 937

Göttingen Campus

MULTISCALE BIOIMAGING

P2M Physics-to-Medicine

Physics Meets Medicine
The Heart of Active Matter

International Symposium 2017

September 04.-06., 2017

Alte Mensa, Wilhelmplatz 1

Göttingen

Organizers:

Christoph F. Schmidt, Wolfram H. Zimmermann

Marco Tarantola, Tim Meyer

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Supported by DFG Deutsche Forschungsgemeinschaft

Monday, September 04, 2017

10:00 – 11:00	Arrival and arrangement	
11:00 – 11:30	Welcome by Wolfram-Hubert Zimmermann, Marco Tarantola, Tim Meyer and Christoph Schmidt	
11:30-12:30	Lunch	
	Chair: Marcus Müller	
12:30 – 13:00	Peter Kohl Computational models as drivers of biomedical research: Examples from the heart	
13:00 – 13:20	A01/A16	Claus Heussinger When boundaries melt away: flow and arrest of biological and soft materials
13:20 – 13:40	A02/A13	Christoph Schmidt Non-equilibrium dynamics in model systems and cardiomyocytes
13:40 – 14:10	Ellen Kuhl The physics of heart failure	
14:10 – 14:30	A19	Karen Alim Active matter controls morpology
14:30 – 15:00	Discussion and coffee break	
	Chair: Carsten Beta	
15:00 – 15:30	Fred MacKintosh Extracellular matrix mechanics and mechanical phase transitions	
15:30 – 16:00	Alain Karma Variability and compensation in cardiac electrophysiology at cellular, organ, and population levels	
16:00 – 16:30	Ramin Golestanian Homeostasis and dynamic phase transition in a simple model of dividing chemotactic cells	
16:30 – 16:50	A07/ A11	Tim Salditt Pattern formation in the actin cortex of contractile cells
16:50 – 17:10	A05 /A14	Jörg Enderlein Metal-induced energy transfer (MIET)
17:10 – 18:10	Keynote lecture	Andrew McCulloch Multi-scale modeling of the failing heart: From mouse to human
18:10 – 20:00	Catered Dinner	
20:00	Poster Session	
	Get together	

Tuesday, September 05, 2017

	Chair: Florian Rehfeldt	
09:00 – 09:30	**Ben Fabry** Three-dimensional micro-tissues for disease modelling of desminopathies	
09:30 – 10:00	**Robert Gourdie** Excitation at the gap junction edge: The novel role of the perinexus in cardiac conduction	
10:00 – 10:30	**Beth Pruitt** Engineering iPS cardiomyocyte models	
10:30 – 10:50	Discussion and coffee break	
10:50 – 11:10	SFB 937 **Jan Christoph** Electromechanical Vortices during Cardiac Fibrillation	
11:10 – 11:25	A08 **Marco Tarantola** Mechanics and dynamics of cardiomyocyte adhesion	
11:25 – 11:40	A09 **Eberhard Bodenschatz** Fast propagation regions cause self-sustained reentry in excitable media	
	Chair: Sarah Köster	
11:40 – 12:10	**Paul Janmey** Non-linear elasticity, contraction, and relaxation in cells, tissues and biopolymer networks	
12:10 – 12:40	**Kevin Healy** Human cardiac microphysiological systems for drug discovery, disease modeling, and precision medicine	
12:40 – 13:10	A17 **Andreas Janshoff** Self-organization and mechanics of actomyosin networks attached to artificial and cellular plasma membranes	
13:15 – 14:15	Lunch	
14:15	*SOCIAL PROGRAM* Castle *Burg Hanstein* visit and guided tour (eng/ger)	
18:30	Conference Dinner *Klausenhof* medieval restaurant next to the Castle	

Wednesday, September 06, 2017

	Chair: Marco Mazza
09:00 – 09:30	Josef Käs A new type of unjamming transitions in cancer
09:30 – 10:00	Igor Efimov Novel cardiac technology: flexible bioelectronics, microfluidics, and organotypic culture
10:00 – 10:30	Tal Dvir Advanced technologies for engineering functional cardiac patches
10:30 – 10:50	A10 Jörg Großhans Tissue remodelling in Drosophila embryonic development
10:50 – 11:10	Discussion and coffee break
11:10 – 11:40	Elliot Elson How best to describe the physiological state of an engineered heart tissue?
11:40 – 12:10	Lior Gepstein Optogenetic control of human induced pluripotent stem cell derived cardiac tissues
12:10 – 12:30	A18 Wolfram-Hubertus Zimmermann Directed self-assembly of human heart muscle
12:30 – 13:30	Lunch
13:30	Closing remarks by Christoph Schmidt and Wolfram-Hubertus Zimmermann
12:30 – 13:30	Departure

Invited Speakers

Dvir	Tal	Tel Aviv University Tissue Engineering and Regenerative Medicine Tel Aviv (ISR)
Efimov	Igor	The George Washington University Department of Biomedical Engineering Washington (USA)
Elson	Elliot L.	Washington University in St. Louis Biochemistry and Molecular Biophysics St. Louis (USA)
Fabry	Ben	Friedrich-Alexander-Universität Center for Medical Physics and Technology Erlangen (GER)
Gepstein	Lior	Israel Institute of Technology Cardiac Electrophysiology and Regenerative Medicine Lab Haifa (ISR)
Golestanian	Ramin	University of Oxford Rudolf Peierls Centre for Theoretical Physics Oxford (UK)
Gourdie	Robert	Virginia Tech Carilion Research Institute Massachusetts Institute of Technology Cambridge (USA)
Healy	Kevin	University of California Berkeley Bioengineering and Materials Science & Engineering Berkeley (USA)
Janmey	Paul	University of Pennsylvania Institute for Medicine and Engineering Philadelphia (USA)
Karma	Alain	Northeastern University Theoretical Condensed Matter and Biological Physics Boston (USA)
Käs	Joseph	Universität Leipzig Peter Debye Institute for Soft Matter Physics Leipzig (GER)
Kohl	Peter	Universitäts-Herzzentrum Freiburg · Bad Krozingen Institut für Experimentelle Kardiovaskuläre Medizin Freiburg (GER)
Kuhl	Ellen	Stanford University Stanford Mechanics and Computation Stanford (USA)
MacKintosh	Fred	Rice University Chemical and Biomolecular Engineering Houston (USA)
McCulloch	Andrew	University of California San Diego Cardiac Biomedical Science and Engineering Center La Jolla (USA)
Pruitt	Beth	Stanford University Mechanical Engineering - Mechanics and Computation Stanford (USA)