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Nanoengineering *for* Mechanobiology

Sunday 27th March 2022 Mechanotransduction		
15:00	Registration	
17:00	Aldo Ferrari, Massimo Vassalli	Introduction
17:15	**Boris Martinac**	**3.8 billion years of mechanotransduction: From osmoregulation to the sense of touch**
18:00	Mariana Azevedo Gonzalez Oliva	The role of Piezo1 in transducing viscoelasticity to the cell nucleus
18:30	*Cytosurge / Tamás Gerecsei*	*High throughput single-cell adhesion measurements enabled by fluidic force microscopy*
18:45	Valeria Venturini	The nucleus acts as an elastic mechanosensor to gauge physical shape deformation and control cellular behavior
19:15	**Joachim Spatz**	**Matter to life: bottom-up assembly of synthetic cells**
20:00	Welcome cocktail	

Program of the event

Monday 28th March 2022		
Mechanochemistry / Tunable Biomaterials		
9:00	**Andreas Herrmann**	**Controlling the activity of drugs, proteins and genes by ultrasound**
9:45	Eva Carvalho	Oligodendrocytes have feelings too - A tissue engineering approach to uncover the mechanobiology of myelination
10:15	Sylvain Gabriele	Sensing the curvature: active mechanics and nuclear mechanoadaptation
10:45	Coffee Break and Poster Viewing	
11:15	**Kerstin Blank**	**Shedding light on cell-material interactions with coiled coil-based molecular force sensors**
12:00	*Impetux / Oriol Nos*	*Extending Optical Tweezers from Extracellular to Intracellular Cell Mechanics*
12:15	Lorenza Garau Paganella	3D models to investigate the biological effects of chemomechanical coupling in the dermal niche
12:45	Lunch	
13:45	Poster Session	
15:00	**Robert Göstl**	**From force-reporting to force-resistant: using mechanochemistry to understand polymer materials**
15:45	Delphine Gourdon *EBSA speaker*	3D tunable fibronectin-collagen tumour-mimicking platforms for control of cell adhesion and matrix deposition
16:15	*Optics11 Life / Luca Bersanini*	*High-throughput mechanical screening solutions for cells and biomaterials*
16:30	Arne Gennerich	Single-molecule studies of KIF1A motion and force generation
17:00	Coffee Break	
17:30	**Aránzazu del Campo Bécares**	**Engineered living therapeutic materials: new concepts for sustained and sustainable drug delivery**
18:15	Susan Babu	Enhancing the guided growth of neurons using synthetic Anisogels
18:45	Stefan Jentsch	Drop-on-demand acoustic bioprinting from picoliter to nanoliter range avoiding wall shear stress

Tuesday 29th March 2022		
Translation of mechanobiological insights/methods into clinical settings		
9:00	Mark Schvartzman	Nanoscale spatio-mechanical regulation of the immune signaling in cytotoxic lymphocytes
9:30	Nafsika Chala	Mechanical fingerprint of senescence in endothelial cells
10:00	Florian Friedland	Cyclic tissue strain triggers apoptotic cell extrusion in early breast gland development.
10:30	Coffee Break	
11:00	**Jochen Guck**	**Feeling for Covid19**
11:45	Seb Doherty-Boyd	Developing a synthetic bone marrow niche for hematopoietic stem cell maintenance
12:15	Patrizia Romani	Mitochondrial fission links ECM mechanotransduction to metabolic redox homeostasis and metastatic chemotherapy resistance
12:15	It's Time for Translation – Young Scientist Award presentations	
12:45	Lunch in Recco	
15:00	Visit to Genova	
20:00	Social Dinner	

Program of the event

Wednesday 30th March 2022		
Mechanobiology of multicellular systems		
9:00	**Sara Wickström**	**Regulation of cell fate and integrity by nuclear mechanotransduction**
9:45	Aleksandra Kozyrina	Extracellular matrix spatial heterogeneity drives retinal epithelium mechanobiology
10:15	Rudolf Merkel	Behavior of Skin and Skin Models Under Mechanical Strain
10:45		Coffee break and Poster Viewing
11:15	**Pierre-Francois Lenne**	**Mechanics of cell-cell contacts beyond the bounds of adhesion and cortical tension**
12:00	*Nanosurf / Gotthold Fläschner*	*New research paths open in AFM and beyond with Nanosurf CleanDrive and WaveMode*
12:15	Kenji Nishizawa	Shaping cell contacts by locally applied forces
12:45		Lunch
13:45		Poster Session
15:00	**Pascal Silberzan**	**Active cells nematics: Architectures and flows**
15:45	Pierre Ucla	Dynamics of endothelial engagement and filopodia formation in complex 3D microstructures
16:15	*Bruker / Heiko Haschke*	*From Single Molecule Dynamics to Automated Large Scale Mechanical Mapping – Multiparametric Microscopy Solutions from Bruker Nano Surfaces*
16:30	Young Choi	Use of a novel bistable stretching device for investigating acute stretch of endothelial monolayers and the effects of senescence
17:00		Coffee Break
17:15	**Daniel Müller**	**Quantifying individual cell membrane receptors regulating cell mass, adhesion and rheology**
18:00	*Lumicks / Kalthoum Ben M'Barek*	*From Single-Protein to Single-Cell: a unique platform that combines optical tweezers and fluorescence microscopy for the study of Cytoskeletal Processes and Cell Mechanics*
18:15	Kay-Eberhard Gottschalk	Super-resolution imaging with metal-induced energy transfer reveals effect of force on the actin cytoskeleton
18:45	Sandra Citi	Cingulin tethers nonmuscle myosin 2B to ZO-1 to mechanoregulate the apicolateral membrane and the tight junction barrier

Thursday 31st March 2022		
Role of mechanics in Morphogenesis		
9:00	**Carl-Philipp Heisenberg**	**Mechanochemical feedback loops in early zebrafish embryogenesis**
9:45	Elijah R Shelton	Towards mechanical stimulation of stem cell derived retinal organoids
10:15	Wolfgang Wagner	Spatial self-organization of pluripotent stem cells in colonies and aggregates
10:45	**Karine Guevorkian**	**Mesodermal mechanics during the axial morphogenesis of chicken embryo**
11:30	Anna Sternberg	The impact of mechanical forces in preparation for human embryo implantation
12:00		Closing Remarks

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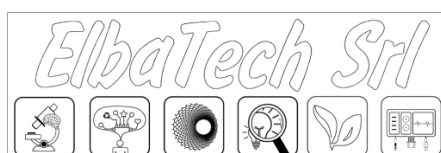
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