

Physics of Cancer 2021

(Aug 30 - Sept 1, 2021)

Monday - August 30, 2021

11:00 - 13:00 *Conference check-in*

13:00 - 13:15 *Opening | Welcome*

Session I: From Cells To Tissue

13:15 - 13:45 **Xavier Trepât**
Mechanobiology of intestinal organoids
(Inst. for Bioengineering of Catalonia, Spain)

13:45 - 14:15 **Matthias Lütolf**
Geometric control of intestinal organoid patterning
(EPFL, Lausanne, CH
Roche Innovation Center Basel, CH)

14:15 - 14:30 **Tom Brandstätter**
Velocity waves in rotating multicellular spheroids
(Ludwig-Maximilian-University Munich, Germany)

14:30 - 15:00 **Yanlan Mao**
Coping with Mechanical Stress: Tissue dynamics in development and repair
(University College London, GB)

15:00 - 15:30 Coffee break

Session II: Magnetic Resonance Elastography 1

15:30 - 16:00 **Jens Würfel**
Brain-MRE in neuro-oncology
(University of Basel, CH)

16:00 - 16:30 **Marvin Doyley**
Using tumor biomechanics to understand tumor response to therapy
(University of Rochester, USA)

16:30 - 16:45 **Steffen Grosser**
Cell and nuclei jointly deform to actively fluidize tumor clusters
(Leipzig University, Germany)

16:45 - 17:15 **John Huston, III.**
MR Elastography of brain tumors
(Mayo Clinic, USA)

Tuesday - August 31, 2021

Session III: Magnetic Resonance Elastography 2

09:00 - 09:30 **Jing Guo**
Tomoelelastography in biomechanical characterization of cancer in vivo
(Charité Berlin, Germany)

09:30 - 09:45 **Frank Sauer**
Tissue stiffness and fluidity as tumor markers with predictive potential
(Leipzig University, Germany)

09:45 - 10:15	Andreas Melzer <u>Ultrasound and magnetic resonance guided focused ultrasound</u> (Leipzig University, Germany)
10:15 - 10:45	Coffee break
10:45 - 11:15	Liang Zhu <u>MR elastography for pancreatic diseases</u> (Peking Union Medical College Hospital, Beijing, China)
11:15 - 11:30	Johannes Rheinlaender <u>Combined scanning probe and traction force microscopy to study the relation between mechanical material properties and contractile forces in living cells</u> (University Tübingen, Germany)
11:30 - 12:00	Sponsored talk by ibidi GmbH (Elias Horn) <u>Innovative tools and surfaces in 3D cell culture and single cell arrays</u>
12:00 - 13:00	Lunch break
13:00 - 15:30	Digital postersession Young Scientist Awards

Session IV: Physics of Cancer

15:30 - 16:00	Richard Barr <u>What can ultrasound elastography tell us about cancer</u> (Northeast Ohio Medical University, USA)
16:00 - 16:15	Ion Andreu <u>Mechanosensitivity of nucleocytoplasmic transport</u> (Universidad de Navarra, Spain)
16:15 - 16:45	Thomas Fuhs <u>Why do rigid tumors contain soft cells?</u> (Leipzig University, Germany)
16:45 - 17:15	Ovijit Chaudhuri <u>Extracellular matrix viscoelasticity and its impact on cells</u> (Stanford University, USA)

Wednesday - September 1, 2021

Session V: Cell Motility 1

09:00 - 09:30	Cornelia Monzel <u>Probing and manipulating cell signalling pathways with magnetogenetics</u> (Heinrich-Heine University, Düsseldorf, Germany)
09:30 - 09:45	Cornelia Clemens <u>Instructive phenotype switching of breast cancer cells at matrix interfaces</u> (Leipzig University, Germany)
09:45 - 10:00	Tom Phillips <u>All bark and no bite?: Studying the role of YAP in a novel, stiffness-dependent multicellular tumour spheroid invasion model with high- and super-resolution imaging</u> (King's College London, GB)
10:00 - 10:30	Otger Campás <u>Shaping embryos through controlled tissue phase transitions</u> (TU Dresden, Germany)

University of California, Santa Barbara, USA)

10:30 - 11:00 Coffee break

Session VI: Cytoskeleton Mechanics

11:00 - 11:30 **Elisabeth Fischer-Friedrich**
Tension-sensitive binding of actin cross-linkers in live cells
(TU Dresden, Germany)

11:30 - 11:45 **David Böhringer**
Cell-generated forces and matrix remodelling in 3-D disease models
(FAU Erlangen-Nuremberg, Germany)

11:45 - 12:15 **Sarah Köster**
Intermediate filament mechanics: from molecular interactions to network properties
(University of Göttingen, Germany)

12:15 - 13:30 Lunch buffet

Session VII: Cell Mechanics

13:30 - 14:00 **Malgorzata Lekka**
Nanomechanical and rheological properties of bladder cancer cells
(Polish Academy of Sciences, Poland)

14:00 - 14:30 **Franziska Lautenschläger**
Weakening the actin cortex promotes formation of microtentacles in noncancer cells
(Saarland University, Germany)

14:30 - 14:45 **Abigail Loneker**
Lipid-droplet mediated nuclear deformation occurs independently of cytoskeletal forces in hepatocytes
(University of Pennsylvania, USA)

14:45 - 15:15 **Johanna Ivaska**
Tuning cell behavior through integrins and ECM rigidity
(Turku University, Finland)

15:15 - 15:45 Coffee break

Session VIII: Cell Motility 2

15:45 - 16:15 **Lance Munn**
The impact of tumor-generated forces on cell biology and immunotherapy
(Harvard Medical School, USA)

16:15 - 16:45 **Paul Janmey**
Correlations among substrate composition, cell motility, and stiffness in cancer and non-cancer cell lines
(University of Pennsylvania, USA)

16:45 - 17:00 **Alice Abend**
Adhesion dynamics and organization of neurons and glial cells on nanocolumnar TiN substrates
(Leipzig University, Germany)

17:00 - 17:30 **Ming Guo**
Biomechanical imaging of multicellular invasion in 3D
(Massachusetts Institute of Technology, USA)

17:30 **Prospective end**