13th Symposium "Physics of Cancer"

September 28 - 30, 2022 / Leipzig, Germany

Wednesday - September 28, 2022

11:00 - 13:00	Conference check-in
13:00 - 13:15	Welcome
13:15 - 13:45	Opening Talk: **Cornelia Monzel** *Physics of Cancer - From Fundamental Biophysics to Translational Research* (Heinrich-Heine University Düsseldorf, Germany)

Session I: Cancer Immunotherapy

13:34 - 14:15	**Helmut Hanenberg** *Genetic Engineering of Immune Effector Cells for Cancer Therapy* (University Hospital Düsseldorf, Germany)
14:15 - 14:45	**Wolfgang Parak** *In and Out of Nanoparticles Into/Out of Cells* (University of Hamburg, Germany)
14:45 - 15:15	**David J. Odde** *Differential Migration Mechanics and Immune Response of Glioblastoma Subtypes* (University of Minnesota, USA)
15:15 - 15:30	Contributed Talk: **Eric Behle** *On the Road to Cellular Digital Twins of in Vivo Tumors* (Jülich Research Center, Germany)
15:30 - 16:00	Coffee break
16:00 - 16:30	**Erdem D. Tabdanov** *Mechanistic and Mechanobiologic Principles of Immune and Cancer Cells 3D Motility Within Mechanically and Structurally Complex Microenvironments* (University of Pennsylvania, USA)
16:30 - 17:00	**Pouyan E. Boukany** *Flow, Deformation and Invasion of Tumor Spheroids on-a-Chip* (TU Delft, NL)

17:00 - 17:15	Contributed Talk: **Astrid Kupferer** *Nanotube Scaffolds: Versatile and Customizable Culture Platform for Cells and Tissues* (Leibniz Institute of Surface Engineering (IOM) e.V., Germany)
17:15 - 20:00	**Postersession (onsite and virtual)** - including dinner buffet-

Thursday - September 29, 2022

Session II: Cancer Cell Migration and the Tumour Microenvironment

09:00 - 09:30	**Fabio Giavazzi** *Tissue Fluidification Promotes a Pro-Inflammatory Transcriptional Carcinoma Response in Invasive Breast* (Università degli Studi Di Milano, Italy)
09:30 - 10:00	**Carl-Philipp Heisenberg** *A Positive Feedback Loop between Mesendoderm Cell Migration and Interstitial Fluid Relocalization is Required for Embryonic Axis Formation in Zebrafish* (Institute of Science and Technology Austria, Austria)
10:00 - 10:15	Contributed Talk: **Vaibhav Mahajan** *Mapping Tumor Spheroid Mechanics in Dependence of 3D Microenvironment Stiffness and Degradability by Brillouin Microscopy* (TU Dresden, Germany)
10:15 - 10:45	Coffee break
10:45 - 11:15	**Athina Markaki** *Human 3D Vascularised Tumoroid Model for Glioblastoma Angiogenesis* (University of Cambridge, UK)
11:15 - 11:45	**Andrew Clark** *Self-Generated Gradients Steer Collective Migration on Viscoelastic Collagen Networks* (University of Stuttgart)
11:45 - 12:00	Contributed Talk: **Bin Qu** *Physical Properties of 3D Matrix Regulate Killing Efficiency of Cytotoxic T Cells* (Saarland University, Germany)

12:00 - 12:30	**Ulrich Schwarz** *Control of Traction Forces, Force Propagation between Cells and Cell Migration by Optogenetics*
12:30 - 14:00	Lunch break
14:00 - 14:15	Contributed Talk: **Sabine Windhorst** *Distinct F-actin Networks are Required for Filopodia Motility and Migration of Cancer Cells* (University Medical Center Hamburg-Eppendorf)
14:15 - 14:45	**Cynthia Reinhart-King** *The Intersection of Mechanobiology and Cellular Metabolism in Cancer* (Vanderbilt University, USA)
14:45 - 15:15	Coffee break
15:15 - 15:30	Contributed Talk: **Markéta Kubánková** *Single-Cell Physical Phenotyping of Mechanically Dissociated Tissue Biopsies for Fast Diagnostic Assessment* (Max Planck Institute for the Science of Light, Germany)
15:30 - 16:00	**Heiko Rieger** *Centrosome Positioning and Re-Positioning in Immune Cells* (Saarland University, Germany)
16:00 - 16:30	**Adrian Shimpi** and **Garrett Beeghly** *Biophysical Contributions of Adipose Tissue to Breast Cancer Invasion* (Cornell University, USA)
18:30	**Social Event for Invited Speakers**

Friday - September 30, 2022

Session III: Nanoagents for Targeted Cancer Cell Manipulation

09:00 - 09:15	Contributed Talk: **Thomas Fuhs** *Rigid Tumors Contain Soft Cells* (Technical University Freiberg, Germany)
09:15 - 09:45	**Simone Schürle-Finke** *Engineering Synthetic and Living Micro-and Nanoagents for Cancer Diagnosis and Therapy* (ETH Zurich, Switzerland)
09:45 - 10:15	Coffee break

10:15 - 10:45	**Christoph Mark** *Three-Dimensional Force Microscopy of Immune Cells in Biopolymer Networks* (Friedrich Alexander University Erlangen-Nuremberg, Germany)
10:45 - 11:15	**Young-wook Jun** *Size, Force, and Entropy at the Cellular Interface* University of California, San Francisco (UCSF)
11:30 - 13:00	Lunch break

Session IV: Cell Mechanics in Cancer

13:00 - 13:30	**Denis Wirtz** *Mapping the Three-Dimensional Tumor Microenvironment at Single-Cell Resolution Using CODA* (Johns Hopkins University, USA)
13:30 - 14:00	**Rudolf Leube** *The Keratin-Desmosome-Hemidesmosome Scaffold* (University Hospital RWTH Aachen, Germany)
14:00 - 14:30	**Cécile Leduc** *Structure and Assembly of Vimentin Intermediate Filaments* (Institut Jacques Monod, France)
14:30 - 14:45	Contributed Talk: **Tom Golde** *The Role of Intermediate Filaments in Stress Resistance in 3D Epithelial Structures* (Institute of Bioengineering of Catalonia (IBEC), Spain)
14:45 - 15:15	**Tilman E. Schäffer** *High-Speed Atomic Force Microscopy and Scanning Ion Conductance Microscopy for Investigating the Mechanics and Dynamics of Cancer Cells* (Tübingen University, Germany)
15:15 - 15:45	Coffee break
15:45 - 16:15	**Peter Friedl** *Cancer Cell Invasion - Plasticity of Biomechanics in Response to Energy Deprivation* (Radboud University Medical Centre, Nijmegen, The Netherlands)
16:15 - 16:45	**Jacopo Ferruzzi** *Biomechanical Tumor-Matrix Interactions in Breast Cancer Invasion* (The University of Texas at Dallas, USA)