

Physics of Cancer 2023

(October 4 - 6, 2023)

Wednesday - October 4, 2023

09:30 - 11:30	Conference check-in
11:30 - 11:45	Opening Welcome
Opening Talk	
11:45 - 12:15	Pep Pàmies <u>Accelerating the impact of cancer mechanopathology</u> (Nature Biomedical Engineering, GB)

Session I: Cancer cell and tissue mechanics I

12:15 - 12:45	Timo Betz <u>Quantifying intracellular mechanics by active and passive measurements</u> (Georg-August University of Göttingen, Göttingen, Germany)
12:45 - 13:45	Lunch break
13:45 - 14:15	Elisabeth Fischer - Friedrich <u>Epithelial-mesenchymal transition and its influence on actin-cytoskeletal regulation and cell proliferation</u> (TU Dresden, Germany)
14:15 - 14:30	Ricard Alert <u>Friction-taxis underlies adhesion-independent durotaxis</u> (Max Planck Institute for the Physics of Complex Systems, Germany)
14:30 - 15:00	Helen Matthews <u>The effect of Ras oncogenes on cell mechanics</u> (University of Sheffield, GB)
15:00 - 15:30	Coffee break

Session II: Cancer cell and tissue mechanics II

15:30 - 16:00	Jing Guo <u>Investigate the biomechanical traits of hepatocellular carcinoma with MRE</u> (Charité Berlin, Germany)
16:00 - 16:15	Leonardo Barzaghi <u>Tissue fluidification in pathophysiology:</u> <u>Contact percolation sets phase transition and genetic rewiring</u> <u>in heterogeneous breast cancers</u> (The AIRC Institute of Molecular Oncology, Milan, Italy)
16:15 - 16:45	Paul Janmey <u>Deformation of metabolically intact isolated nuclei</u> (University of Pennsylvania, USA)
16:45 - 17:15	Natalie Dye <u>Heterogeneity of polarity and morphology in gastric cancer patient</u> <u>derived organoids</u> (TU Dresden, Germany)
19:00	Classical Concert For All (see webpage for more information)

Thursday - October 5, 2023

Session III: Cancer cell mechanobiology I	
09:00 - 09:30	Xavier Trepât <u><i>Mechanobiology of intestinal organoids and tumoroids</i></u> (IBEC Barcelona, Spain)
09:30 - 09:45	Quirine J. S. Braat <u><i>Cluster formation of motile cells at the onset of cancer metastasis</i></u> (Eindhoven University of Technology, The Netherlands)
09:45 - 10:15	Coffee break
10:15 - 10:45	Marino Arroyo <u><i>A mecano-biological feedback between cells and the ECM organizes and sustains collective invasion</i></u> (University of Barcelona, Spain)
10:45 - 11:15	Khalid Salaita <u><i>Feeling the force: molecular tools for quantifying cellular traction forces</i></u> (Emory University, USA)
11:15 - 13:00	Lunch break
13:00 - 15:30	POSTERSESSION Young Scientist Awards

Session IV: Cancer cell mechanobiology II	
15:30 - 16:00	Jan Lammerding <u><i>Cancer cell migration through confined spaces: mechanisms and consequences</i></u> (Cornell University, USA)
16:00 - 16:30	Carlos Perez - Gonzalez <u><i>Self-organizing principles driving tumor hierarchy and stemness</i></u> (Institut Curie, France)
16:30 - 16:45	Bin Qu <u><i>Mechanosensing regulates immune killer cell-mediated immune surveillance</i></u> (Saarland University, Germany)
16:45 - 17:15	Adam E. Engler <u><i>Understanding and exploiting cancer cell adhesion</i></u> (UC San Diego, USA)
17:15 - 17:45	Sergi Garcia - Manyes <u><i>Oxidative stress regulates talin mechanosensing</i></u> (King's College London, GB)
18:30	Speaker's Dinner (see webpage)

Friday - October 6, 2023

Session V: Tumor cell dynamics I	
09:00 - 09:30	Maxim Lavrentovich <u><i>Effects of geometry on cell competition and survival at growing tumor edges</i></u> (Worcester State University, USA)

09:30 - 10:00	Elisabeth Cavalcanti - Adam <u>Impact of cell adhesion during unjamming transition</u> (MPI Heidelberg, Germany)
10:00 - 10:15	Paolo Maiuri <u>Force-biased nuclear import sets nuclear-cytoplasmic volumetric coupling by osmosis</u> (Federico II University of Naples, Italy)
10:15 - 10:45	Pere Roca - Cusachs Soulere <u>Controlling nuclear mechanics from the extracellular matrix and intermediate filaments</u> (IBEC Barcelona, Spain)
10:45 - 11:15	Coffee break

Session VI: Tumor cell dynamics II

11:15 - 11:45	Vivek Shenoy <u>Chemo-mechanical diffusion waves orchestrate collective dynamics of immune and cancer cell podosomes</u> (University of Pennsylvania, USA)
11:45 - 12:15	Erik Sahai <u>Cell migration and stromal fibroblasts sculpt patterns of cancer invasion, evolution, and therapy resistance</u> (Francis Crick Institute, GB)
12:15 - 12:30	Ralf Steuer <u>Coarse-grained computation models of cancer metabolism and cellular growth</u> (Humboldt-University of Berlin, Germany)
12:30 - 13:30	Lunch buffet

Session VII: Tumor microenvironment interactions I

13:30 - 14:00	Amaia Cipitria <u>Biomaterials in cancer dormancy and early metastasis</u> (Biodonostia Health Research Institute, Spain)
14:00 - 14:30	Heiko Enderling <u>High resolution modeling of cell migration in the tumor immune ecosystem</u> (MD Anderson Cancer Center, USA)
14:30 - 14:45	Yoav G. Pollack <u>Competition for space in tumors: Does dead matter matter?</u> (University of Göttingen, Germany)
14:45 - 15:15	Herbert Levine <u>Partial EMT versus unjamming, and their relevance for metastatic competence</u> (Northeastern University)
15:15 - 15:45	Coffee break

Session VIII: Tumor microenvironment interactions II

15:45 - 16:15	Ingolf Sack <u>Bulk tissue fluidity by in vivo MR elastography as a prognostic tumor marker</u> (Charité Berlin, Germany)
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16:15 - 16:30	Aranzazu Villasante <u>Identification of GB3 as a novel target for the alternative vasculature in neuroblastoma using a stiffness-based model</u> (IBEC and BIST, Barcelona, Spain)
16:30 - 17:00	Johanna Ivaska <u>Uncoupling cell responses from stiffness</u> (University of Turku, Finland)
17:00 - 17:30	Li Tang <u>Overcoming a mechanical immune checkpoint for enhanced cancer immunotherapy</u> (EPFL Lausanne, Switzerland)
17:30	Prospective end