

IMCB Invited Speaker



Speaker : Dr. Maté Biro
*Research Officer & Honorary Associate,
Centenary Institute of Cancer Medicine and Cell Biology,
The University of Sydney, Australia*

Date : 26 February 2014, Wednesday

Time : 11:00AM - 12:00PM

Venue : IMCB Seminar Room 3-46, Level 3, Proteos, Biopolis

Host : Dr. Weimiao Yu

Seminar :

Cellular actin cortex composition and homeostasis resolved by integrating quantitative imaging and proteomics

The cellular actin cortex is the cytoskeletal structure primarily responsible for the control of animal cell shape and as such plays a central role in cell division, migration and tissue morphogenesis. Due to the lack of experimental systems where the cortex can be investigated independently from other organelles, little is known about its composition, assembly and homeostasis. Here, we describe novel tools to resolve the composition, dynamics and regulation of the cell cortex based on an integrative and multidisciplinary method encompassing laser ablation, high-speed confocal imaging, automated quantitative image analysis, scanning electron microscopy and mass spectrometry. We show that cellular blebs, spherical membrane protrusions that exhibit de novo actin cortex assembly, constitute a rare model system to study the actin cortex and form excellent purified cortical fractions when isolated. We report a first extensive parts list of cortical components and present an automated imaging assay for precise quantification of cortical actomyosin assembly dynamics. We show subtle changes in cortex assembly dynamics upon depletion of the identified cortical component profilin. Our widely applicable integrated method paves the way for systems-level investigations of the actomyosin cortex and of cortex regulation during morphogenesis.

About the Speaker :

Maté received his PhD at the Max Planck Institute of Molecular Cell Biology and Genetics, Dresden, Germany, in 2011. His doctoral work in Ewa Paluch's laboratory was focused on the mechanics and regulation of cellular actin cortex assembly. He previously studied Physics (BSc) and Bioinformatics (MSc) at the Imperial College in London, UK, and did his Masters research at MIT, Cambridge, MA, USA, with Paul Matsudaira. He also worked as a research associate at the Bioinformatics Institute of the A*STAR in Singapore. Since 2012, he works at the Centenary Institute and the University of Sydney in Australia, where he is establishing his own subgroup within the Immune Imaging program headed by Wolfgang Weninger. His research, highly multidisciplinary in nature, focuses on the regulation and dynamics of the cytoskeleton, notably during the migration cancer cells.



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