

IMCB Invited Speaker



Speaker : Dr. Nicolas Plachta
*Group Leader, EMBL Australia,
Monash University, Australia*

Date : 14 November 2013, Thursday

Time : 10:00AM - 11:00AM

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

Host : Prof. Wang Yue

Seminar :

Imaging how mammalian cells choose their place and fate in live embryos

Each of our own cells must resolve both its fate and relationships to its neighbours. These linked decisions are critical for any multicellular organism, yet their real time control in vivo and in mammals remains unknown. I will present how applying single-cell imaging in living mouse embryos, we discovered how cells control their fate and then form a tissue-like structure using transcription factor (TF) dynamics and filopodia, respectively.

We recently provided the first biophysical explanation of how TFs search and bind DNA to control pluripotency in preimplantation embryos, combining quantitative technologies like fluorescence correlation spectroscopy (FCS) with photoactivation and modelling. We also found that cells use a new class of filopodia to form a tissue-like structure during embryo compaction, which is the first morphogenetic event essential for embryogenesis. These filopodia are needed for cells to draw their neighbours closer, providing a mechanism to understand how abnormal cell-cell interactions can cause preimplantation defects and cancer.

Our current work is revealing the dynamic molecular and morphological mechanisms cells use to form a mammalian organism in real time.

About the Speaker :

I am a principal investigator at EMBL Australia since 2011 (based at Monash University). I did my postdoc in biological imaging with Scott Fraser at the California Institute of Technology (USA), supported by EMBO, SNF and CIRM fellowships. I did my Ph.D. in stem cell research and neuroscience with Former Max Planck Institute Director Yves-Alain Barde, at the University of Basel and Friedrich Miescher Institute (Switzerland). Originally from Argentina, I studied biology at the universities of Buenos Aires (Argentina) and Tel-Aviv (Israel).