Institute of Medical Biology
A*STAR

Seminar Announcement

- All Are Welcome -



Speaker : **Dr Matthew Raab**
Institute Curie – Paris, France

Title : ***"Nuclear envelope rupture during cell migration are repaired by ESCRT III to limit DNA damage and cell death"***

Date : **14 July 2016 (Thursday)**
Time : **11:00am – 12:00pm**
Venue : **Creation Theatre, Matrix Level 4**
Host : **Dr Oliver Dreesen**

Abstract:
The nuclear envelope separates cytoplasm from the nucleus during interphase, and breaks down only transiently during mitosis. We find that immune and cancer cell migration through confined environments causes opening of this barrier which is then resealed. The physical stress exerted on the nucleus from migrating through narrow holes causes this nuclear envelope breakage, allowing mixing of cytoplasm into the nucleus and vice versa nuclear components into the cytoplasm. We use micro-channel devices with controlled channel widths to change the amount of stress placed on the nucleus during migration, but we also see leakage of NLS-GFP in fast immune cell migration in ex vivo systems. ESCRT III machinery helps to reseal the nuclear envelope and depletion of Lamin A/C strongly reduces the efficiency of this repair. We leaked this rupture with double strand DNA breaks with increases in 53BP1-GFP foci which occur minutes after nuclear envelope rupture. These foci disappear after the nucleus reseals its envelope indicating these DNA breaks are repaired. Transient nuclear envelope rupture during migration has many implications as there are many instances of cell migration through dense tissues in vivo and may be responsible for acquiring genetic mutations and even necessary for various biological events.

About the Speaker:
Matthew Raab is now an HFSP post-doctorate research fellow at the Institut Curie in the lab of Matthieu Piel in the department of Subcellular Structure and Cellular Dynamics. Before that, he obtained his PhD in Bioengineering at the University of Pennsylvania and his Bachelor's and Master's degrees in Bioengineering at the Pennsylvania State University.