Department of Biochemistry and Molecular Biology

2018 Seminar Series

Thursday 30th of August
12-1pm
Bio21 Institute Auditorium
30 Flemington Road, Parkville

Dr Senthil Arumugam

EMBL Australia Node in Single Molecule Science Centre, University of New South Wales

Imaging the early events of EGF receptor trafficking using Lattice light-sheet microscopy.

Bio: Senthil Arumugam is a group leader at the Single Molecule Science at the University of New South Wales since Aug 2016. His current research focusses on understanding the dynamic intracellular organization of single cells using rapid volumetric microscopy. He obtained his Masters from Tata Institute of Fundamental Research, India in 2008 and then earned his Ph.D. from Technical University of Dresden and MPI-CBG, Dresden, Germany in 2012. He moved to Paris for his postdoctoral training at the Curie Institute and was a visiting scientist at the National Centre for Biological Sciences, Bangalore, India before starting his own group (www.cellphylab.com) in Sydney, Australia.

Abstract: The dynamics and fate of endosomal vesicles following endocytosis at the plasma membrane are central to the understanding of transport phenomena and signal processing by living cells. Imaging multiple species of endosomal markers along with cargoes like transmembrane receptors, cellular pathogens etc. is central to understanding the organizational principles of trafficking. Endosomes, however, display complex behaviors in their dynamics that demands high temporal resolution and at the same time owing to their stochastic motility characteristics in the 3-dimensional milieu, demands volumetric imaging. This poses a non-trivial challenge - volumetric imaging of multiple species of fluorophores in high spatiotemporal resolution in living cells. We capitalize on the Lattice light-sheet based microscopy along with tailored image analysis routines to essentially follow the fate of cargoes post internalization. In the particular study, I will describe complex relations between the dynamics of endosomes marked by APPL1 and EEA1 in non-cargo steady-state conditions as well as the first time points of transferrin and EGFR entry into vesicles. We find that while transferrin does not alter the 'state' of endosomal dynamics, EGFR actuates a subset of endosomes and alters the localization of APPL1 and its trafficking characteristics. We further show that this process is dependent on calcium and that the APPL1 results in a shunt pathway of EGFRs to the peri-nuclear region.

ALL WELCOME. Please join us for a light lunch after the seminar!
Further information: Matthew Dixon (matthew.dixon@unimelb.edu.au)