

# IMCB Invited Speaker



**Speaker : Dr. Alpha Yap**  
*Head, Division of Molecular Cell Biology,  
Institute of Molecular Bioscience, University of Queensland,  
Australia*

**Date :** 27 March 2013 (Wednesday)

**Time :** 11:00AM - 12:00PM

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

**Host :** Prof. Jean Paul Thiery

## Seminar :

### **The active cortex at cell-cell junctions: diversity and principles of self-organization**

Cadherin cell-cell junctions integrate the active cortices of cells together to support tissue cohesion and morphogenesis. Mechanical activity is central to understanding cadherin biology, but its cellular basis is poorly understood. We have now found that the junctional cortex is a dynamic actomyosin network that engages cadherins throughout the apical-to-lateral axis of cell-cell contacts. Strikingly, though, we discovered regional disparities in cortical contractility that distinguished the apical zonula adherens (ZA) from the lateral junctions. Using quantitative live-imaging and mathematical modelling we show that the dynamic behaviour of the junctional cortex can be defined through three interacting processes: cadherin-dependent actin assembly, actin-based myosin recruitment and local actin filament resistance to stress-induced turnover. We propose that these processes serve as local rules within a self-organizing system. The predictive power of this model was established by the demonstration that apical actin stabilization, mediated by N-WASP, was sufficient to account for the distinctive cortical contractility of the ZA. Thus, the mechanical properties of cadherin junctions emerge from the self-organizing cadherin-actomyosin system.

## About the Speaker :

Alpha Yap is a Professor and Head of the Division of Molecular Cell Biology at the Institute for Molecular Bioscience, The University of Queensland. After training in Internal Medicine and Cell Physiology, he undertook post-doctoral research with Barry Gumbiner at Memorial Sloan-Kettering Cancer Center before returning to Australia to establish his independent research group. His laboratory studies the cellular mechanisms responsible for cadherin-dependent morphogenesis, notably the mechanisms and principles that coordinate cadherin adhesion with the cytoskeleton. He was Chair of the 2011 Gordon Research Conference on Cell Contact & Adhesion and will chair the 2016 GRC on Signaling by Adhesion Receptors. He currently serves on the editorial boards of several journals, amongst them Molecular Biology of the Cell, Developmental Cell and Current Biology.



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