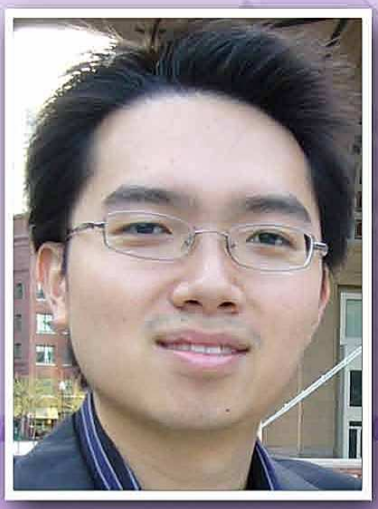
IMCB Invited Speaker



Speaker : **Mr. Shyh-Chang Ng**
PhD student, Biological and Biomedical Sciences,
Harvard Medical School, Boston, USA

Date : 16 July 2013 (Tuesday)

Time : 10:00AM - 11:00AM

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

Host : Prof. Uttam Surana

Seminar :

Lin28 promotes mammalian tissue repair by reprogramming metabolism

Regenerative capacity declines with aging, but the mechanisms relating juvenility and tissue repair remain unclear. The conserved pluripotency factor Lin28 controls developmental timing in animals from worms to humans, and confers juvenility on tissues. To determine if Lin28 can restore regenerative potential in adult tissues, we examined the effect of re-expressing Lin28a in several tissues. When hair was shaved, Lin28a induced hair regrowth. After injury in the ear and digits, Lin28a led to accelerated healing. In the liver, genetic deletion of Lin28a/b impaired regeneration after chemical injury. Although overexpression of let-7, a major downstream target of Lin28, inhibited tissue repair, let-7 knockdown alone failed to enhance tissue repair, suggesting that let-7 suppression is necessary but insufficient to account for Lin28's effects on tissue repair. In probing the mechanism, we found that Lin28a enhanced oxidative phosphorylation to promote tissue repair. Our data indicate that Lin28 enhances tissue repair by reprogramming metabolism to a juvenile bioenergetic state.

About the Speaker :

Ng Shyh-Chang is earning his Ph.D. in Biomedical Sciences, having trained for the past 4 years under the co-mentorship of George Daley and Lewis Cantley at Harvard Medical School, Boston, USA. He is investigating how stem/progenitor cells program their metabolism to maintain self-renewal during embryonic development and regeneration. Specifically, he focused on studying the role of the *Lin28/let-7* axis - a microRNA pathway conserved from *C. elegans* to humans - in regulating myoblast and organismal metabolism via PI3K (Cell 2011). He also used a novel metabolomic approach to elucidate the role of amino acid metabolism in controlling histone methylation for somatic cell reprogramming to pluripotency (Science 2013). Shyh-Chang seeks to understand how we can modulate metabolism to regulate stem cell self-renewal, growth and differentiation, for the goal of treating degenerative diseases such as type 2 diabetes and cancer during aging. He received his A.B. in molecular biology *summa cum laude* (highest honors) from Princeton University, where he wrote a thesis on *Drosophila* morphogen gradient dynamics with Eric Wieschaus.

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