

IMCB Invited Speaker



Speaker : **Dr. Meng How Tan**
*Postdoc, Department of Genetics,
Stanford University School of Medicine, USA*

Date : 19 September 2012 (Wednesday)

Time : 10:00AM - 11:00AM

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

Host : Prof. B. Venkatesh

Seminar :

Genomic and Systems Approaches to Understanding Gene Regulation in Development

Generation and maintenance of specialized tissues during the development and lifespan of a multicellular organism requires exquisite spatiotemporal control of gene activity. The complete repertoire of gene regulatory mechanisms is manifested during vertebrate embryogenesis and a deep understanding of the myriad mechanisms at play is essential for the full exploitation of regenerative medicine. My work leverages on recent advances in technology to derive novel insights into gene regulation during development and tissue homeostasis. I first deconstructed the gene regulatory network operating during preimplantation development of the mouse embryo and through computational modeling and single cell profiling experiments, I uncovered a novel role for pluripotency factors in intrinsic gene expression noise control. To further enable my research into early developmental events, I am developing genomic resources for the more tractable *Xenopus* embryo. Using paired end RNA sequencing, I demonstrated the diversity and dynamics of the transcriptome of *Xenopus tropicalis* during its development from a two-cell embryo to a feeding tadpole. Subsequently, as post-transcriptional regulation of RNA has been found to perform critical functions during development, I utilized single nucleotide resolution deep sequencing data to investigate one such regulatory mechanism known as RNA editing, whereby genomically encoded information is altered at the level of the RNA transcript. Besides vastly expanding the RNA editome, I discovered that edited sites showed complex tissue-specific and development-specific patterns. I will also discuss current and future plans to dissect the functions and regulation of RNA editing in development and human diseases.

About the Speaker :

Meng How Tan is currently a postdoctoral fellow in the Department of Genetics at Stanford University. He received a B.S. degree in mechanical engineering and a B.A. degree in economics from University of California, Berkeley, a M.S. degree in aeronautics from Caltech, a M.S. degree in biomedical engineering from Nanyang Technological University, and a Ph.D. in developmental biology from Stanford University. His overall research direction focuses on understanding mechanisms of gene regulation, with particular interest in applying systems-level approaches and new technology to address fundamental biological questions. During his Ph.D training with Dr. Harley McAdams and Dr. Lucy Shapiro, he discovered and characterized a novel and conserved master transcription factor that controls bacterial cell cycle progression. This work provided a potential therapeutic target for curing some types of bacterial infections. During his postdoctoral training with Dr. Mylene Yao, Dr. Wing Hung Wong, and Dr. Jin Billy Li, he shifted his attention from prokaryotes to vertebrates and studied both transcriptional and post-transcriptional processes in development. His recent research interests have focused on understanding how gene regulation can occur at the level of the RNA and on developing new technologies to aid in this understanding.



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