IMCB Invited Speaker

Speaker : **Dr. Huili Guo**
*Research Fellow, Institute of Medical Biology, A*STAR, Singapore*

Date : 6th June 2012 (Wednesday)

Time : 10am - 11am

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

Host : Prof. Uttam Surana

Seminar :

MicroRNA-Mediated Repression: Insights from Ribosome Profiling

All cells in a multicellular organism carry the same genes, yet these same genes direct the differentiation of many different cell types. The control of such differential gene expression can be exerted at the transcriptional, as well as post-transcriptional, level. MicroRNAs (miRNAs) are ~22-nucleotide small RNAs that mediate posttranscriptional regulation of gene expression by base pairing to their target mRNAs to direct repression. In animals, this repression is usually mediated through translational repression and/or mRNA destabilization.

In studies that investigate miRNA-mediated repression with reporter constructs or individual endogenous genes, translational repression and mRNA destabilization have been observed to contribute variably to the overall level of repression. This led to the question of whether the same was true for endogenous targets at a genome-wide level. While changes in mRNA levels can be easily captured by microarray measurements, it is harder to measure translational repression on a genome-wide scale. To address this gap, I used ribosome profiling to measure effects on protein production and compared these to simultaneously measured effects on mRNA levels. This yielded a snapshot of changes in translational efficiency at the genome-wide level. For both ectopic and endogenous miRNA regulatory interactions, I observed that lowered mRNA levels account for most (≥ 84%) of the decreased protein production. These results show that changes in mRNA levels closely reflect the impact of miRNAs on gene expression and indicate that destabilization of target mRNAs is the predominant reason for reduced protein output.

About the Speaker :

Huili Guo graduated from Cambridge University in 2005 with a B.A. degree in Natural Sciences. In 2011, she received the Ph.D. degree in Biology from the Massachusetts Institute of Technology. She performed her thesis research in the laboratory of David Bartel at the Whitehead Institute for Biomedical Research, where she used ribosome profiling and RNA-Seq to study the molecular consequences of microRNA-mediated repression in mammalian systems. She is currently a research fellow at the Institute of Medical Biology in Singapore. She is a recipient of National Science Scholarships from the Agency for Science, Technology and Research (A*STAR) in 2002 (BS) and 2006 (PhD). In 2010, she received the RNA Society Poster Award at the Gordon Research Conference on the Biology of Post-Transcriptional Gene Regulation. She was an invited speaker at the annual meeting of the American Society of Nephrology in 2011, as part of a premeeting program that focused on microRNAs.

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