

IMCB Invited Speaker



Speaker : Prof. Liang Tong
*Professor and Chair, Department of Biological Sciences,
Columbia University, New York, USA*

Date : 26 November 2013, Tuesday

Time : 11:00AM - 12:00PM

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

Host : Prof. Haiwei Song

Seminar :

mRNA processing, decay and quality control in eukaryotes

Most eukaryotic mRNA precursors (pre-mRNAs) must undergo extensive processing, which includes 5'-end capping, splicing and 3'-end cleavage and polyadenylation. Two distinct machineries, each with a large number of protein factors, are required for 3'-end processing of different types of pre-mRNAs. We have determined the crystal structures of several proteins and sub-complexes in these machineries, which have provided molecular insights into their organization and mechanism of action.

5'-end capping occurs early during transcription and it was generally believed that the capping process is always successful and no quality control mechanism was known. Our studies of yeast Rai1 and its mammalian homolog Dom3Z (now renamed DXO) revealed that they are novel eukaryotic enzymes with RNA 5'-end pyrophosphohydrolase (PPH) activity as well as decapping activity toward unmethylated caps. These observations led us to demonstrate that RNA 5'-end capping defects exist in yeast and human cells, and that Rai1/DXO are central players in a novel RNA quality surveillance pathway, promoting the degradation of such defective RNAs. The presentation will also cover our latest discoveries in these and related research areas.

About the Speaker :

Liang Tong is currently Professor and Chair of the Department of Biological Sciences at Columbia University in the City of New York. He received his B.Sc. from Peking University, his Ph.D. training with Prof. Sung-Hou Kim at the University of California, Berkeley, and his post-doctoral training with Prof. Michael G. Rossmann at Purdue University.

In 1992, he became Senior Scientist (and in 1996 Principal Scientist) at Boehringer Ingelheim Pharmaceuticals, Inc., Ridgefield, CT, where he established a structure-based drug design laboratory and carried out research on viral proteases (HCMV protease and HIV protease), p38 MAP kinase, and other medically important proteins. He received the Boehringer Ingelheim (Worldwide) Research & Development Award for his accomplishments.

In 1997, he moved to Columbia University and established a vigorous research program on the structural biology of proteins of medical/biochemical importance. He has been highly productive in his scientific research, and has so far published more than 200 papers, including those in *Nature*, *Science*, *Cell*, *Molecular Cell*, *Nature Structural and Molecular Biology*. He was elected a Fellow of the American Association for the Advancement of Science in 2009. He became of the Chair of the Department in 2013.