IMCB Invited Speaker



Speaker : **A/Prof. Ling Shuo-Chien**
Department of Physiology, Centre for Translational Medicine
National University of Singapore

Date : 25 April 2014, Friday

Time : 11:00AM - 12:00PM

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

Host : A/Prof. Philipp Kaldis

Seminar :

RNA-Binding Proteins in Neurological Diseases: Determine How TDP-43 and FUS/TLS Trigger Neurodegeneration

Mutations in two nucleic-acid binding proteins, TDP-43 and FUS/TLS, cause an inherited form of Amyotrophic Lateral Sclerosis (ALS). Independent of mutations in either gene, abnormal aggregates of these two proteins are present in many neurodegenerative diseases, including inherited and sporadic ALS, frontotemporal lobar degeneration (FTLD), Alzheimer's disease (AD), Parkinson's disease (PD) and polyglutamine-repeat expansion diseases, highlighting the prevalence of TDP-43 and FUS/TLS proteinopathies.

An integrated approach is used to elucidate the normal functions and the pathogenic mechanisms of TDP-43 and FUS/TLS. In particular, genome-wide unbiased and quantitative approaches are used to identify both protein and RNA interacting network for TDP-43 and FUS/TLS. Transgenic mice expressing wildtype and either of two ALS-linked mutations in human TDP-43 and FUS/TLS were constructed and used to model human disease. Collectively, we showed that (1) there is a convergence of RNA targets by TDP-43 and FUS/TLS, and (2) the perturbation of both RNA and protein homeostasis is a fundamental molecular feature of ALS and FTLD.

Future work in my laboratory will focus on the role of TDP-43 and FUS/TLS on neuronal and synaptic function during aging and neurodegeneration.

About the Speaker :

During my undergraduate study in Chemical Engineering, I became fascinated by biology, particularly, neuroscience. After obtaining abachelor degree at the National Tsing-Hua University (NTHU), Taiwan, I started to pursue my scientific interest working on understanding synaptic components and structures by isolating synaptic junctions followed by electron microscopy for my master degree thesis at NTHU. I completed my Ph.D. at the Neuroscience program at the University of Illinois at Urbana-Champaign under two mentors, Professors William Greenough and Vladimir Gelfand, to elucidate how synaptic strength can be modified by local dendritic protein synthesis and how cytoplasmic mRNA is transported. After a short postdoc with Professor Vladimir Gelfand at the Northwestern University, I moved to University of California, San Diegowith Professor Don Cleveland, where I worked on the pathogenic mechanisms of motor neuron disease. At October 2013, I joined the Department of Physiology as an assistant professor at the National University of Singapore to investigate the mechanisms of neuronal and synaptic dysfunction during aging and neurodegeneration.

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