CSCB Seminar Series

Title:

Mechanism for AMPK activation in glucose sensing

Abstract:

Metabolic homeostasis is maintained by various cellular sensors, including the master kinases AMPK (AMP-activated protein kinase) and mTORC1. The mechanism for AMPK activation had been mostly studied through biochemical or pharmacological approaches. We found that AXIN, a scaffold protein critical for Wnt signaling, serves as a bridge for the upstream activating kinase LKB1 to form complex with, and activate AMPK. Most surprisingly the lysosomal protein complex v-ATPase-Ragulator, essential for activation of mTORC1, is also required for AMPK activation. Under glucose starvation, the v-ATPase-Ragulator complex becomes accessible to AXIN/LKB1 for AMPK activation. Concurrently, mTORC1 dissociates from the lysosome and becomes inactivated. We have thus revealed a switch between catabolism and anabolism. We have found the signaling route for the anti-diabetic drug metformin in AMPK activation, revealing that metformin depends on the v-ATPase/Ragulator-based lysosomal pathway for AMPK activation and concomitant repression of mTORC1. Most recent work demonstrating that AMPK is a glucose sensor will also be presented.

Date:

6 February 2017, Monday

Time:

3:00PM to 4.00PM

Light refreshments will be served at 2:30 PM

Venue:

Amphitheatre, Level 2
Duke-NUS Medical School
8 College Road, S169857

(Opposite Singapore General Hospital, Block 6/7)

Host:

Dr. FU Naiyang, PhD
Assistant Professor,
Programme in Cancer & Stem Cell Biology,
Duke-NUS Medical School

Speaker:



LIN Sheng-Cai, Ph.D.
Principal Investigator for Regulatory Biology Group
Xiamen University

Biography:

Professor Shengcai Lin finished his B.Sc. at Xiamen University in 1984, and obtained his Ph. D from the University of Texas Medical Center at Dallas in 1991. He received his postdoctoral training at University of California San Diego. He was a principal investigator at the Institute of Molecular and Cell Biology (IMCB) from 1995-2001, and then stayed at Hong Kong University of Science and Technology from 2001-2006. He is currently a professor at the School of Life Sciences, Xiamen University.

His recent major achievement is the elucidation of AMPK activation inside the cell as well as its implication in drug discovery.

No registration is required. All are welcome

Any enquiry, please contact: Amanda Chan (Tel: 6601 5700)