The Singapore Bioimaging Consortium (SBIC)
presents a seminar

on

"The role of Akt in Regulating Insulin-mediated Metabolic Processes in Adipocytes"

Speaker: **Tan Shi-Xiong**
Diabetes and Obesity Research Program
Garvan Institute of Medical Research, Australia

Date : **Monday, 23 April 2012**
Time : **11.00am – 12.00pm**
Venue : **SBIC Seminar Room, 11 Biopolis Way**
Level 2, Helios Building
Singapore 138667
(Please use Level 1 entrance)

Abstract

Insulin mediated metabolic processes such as glucose disposal, protein synthesis and lypolysis that involved the PI3K/Akt pathway. Disruptions in this pathway play a key role in disease. Dr Tan will be presenting his recent findings on two areas involving the Akt signaling pathway :

1) The RabGAP Akt substrate of 160kDa (AS160) regulates GLUT4 trafficking by binding to GLUT4 vesicles (GSVs). Akt-dependent AS160 phosphorylation overcomes this inhibition, facilitating GSV fusion with the plasma membrane (PM). He will show that AS160 associates with the PM via its second PTB domain through phospholipid binding. Overexpression of AS160 mutants impaired for PM binding, or constitutively targeted to the PM enabled delineation of two separate functions for AS160 in GLUT4 trafficking. He proposes that AS160 acts as a regulatory switch in the docking/fusion of GSVs with the PM

2) In 3T3-L1 adipocytes Akt operates over a limited dynamic range, indicating that Akt is a highly sensitive amplification step in the pathway. With robust insulin stimulation, substantial changes in Akt phosphorylation using either pharmacologic or genetic manipulations had relatively little effect on Akt activity. By integrating these data, we observed that half-maximal Akt activity was achieved at a level of Akt phosphorylation corresponding to 5-22% of its full dynamic range. Similar differences were observed between various insulin-regulated pathways such as GLUT4 translocation and protein synthesis. We have now extended this study to explore this demultiplexing effect of Akt in insulin resistance models and preliminary data will be discussed.

About the Speaker

Shi-Xiong Tan completed his BSc with 1st class Honours in 2005 at UNSW, Sydney, Australia. He was awarded the highly competitive Endeavor International Postgraduate Research Scholarship from the Australian government to undertake a PhD in Prof. Dawes' laboratory in 2006 also at UNSW. During this time, he used yeast as a model system to understand the link between cellular stress and redox homeostasis. He published 5 original articles and 1 review article during his PhD. For his postdoctoral training, Shi-Xiong decided to broaden his research horizon and transition into mammalian biology. In Nov 2009 he joined Prof. David James in the Diabetes and Obesity Research Program at the Garvan Institute of Medical Research, Sydney to investigate the involvement of the Akt signaling pathway in metabolism. He has continued his productivity and has already published 3 articles as first author within a period of two years in the James lab. He recently received the best Postdoctoral oral presentation prize from the 18th NSW Cell and Developmental Biology Meeting.

--- Admission is free and all are welcome ---