The Singapore Bioimaging Consortium (SBIC)
presents a seminar on

"Protein Tyrosine Phosphatases in Diabetes: Oxidation, Dysfunction and Therapeutic potential"

Speaker: **Dr Esteban N. Gurzov**
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Host : **Dr Han Weiping**
Date : **Friday, 9 March 2018**
Time : **11.00am – 12.00pm**
Venue : **SBIC Seminar Room**
11 Biopolis Way
Level 2, Helios Building, Singapore 138667
(Please enter via Level 1)

Abstract

Diabetes mellitus is characterised by hyperglycaemia caused by an absolute or relative insulin deficiency. The global prevalence of diabetes has reached more than 410 million individuals, underscoring the need for novel therapeutic strategies targeting the pathology as a multi-organ disease. Protein tyrosine phosphatases (PTPs) constitute a superfamily of enzymes that dephosphorylate tyrosine-phosphorylated proteins and oppose the actions of protein tyrosine kinases. Our published studies and new data suggest that PTPs act as molecular switches for key signalling events in the development of diabetes, i.e. insulin/glucose/cytokine signalling. Dysregulation of these pathways results in metabolic consequences that are cell-specific. Oxidative stress abrogates the nucleophilic properties of the PTP active site and induces conformational changes that inhibit PTP activity and prevent substrate-binding. We have recently developed an innovative proteomic approach to quantify PTP oxidation *in vivo* and demonstrated that this occurs in liver/pancreas under pathological conditions, including obesity and inflammation. The crucial role of PTPs make them promising candidates for the treatment of metabolic disorders.

About the Speaker

Our laboratory focuses on dysfunctional pathways in metabolism and diabetes. Great efforts have been made to understand how different cell types respond to the extracellular stimuli that control signalling pathways in the context of metabolic dysfunction and diabetes, but the molecular mechanisms by which these pathologies occur remain poorly understood. Our vision is to tackle diabetes as a multi-organ disease. For this purpose, we study the mechanisms of insulin-producing β-cell dysfunction and death in the pancreas and insulin resistance in the liver, muscle and fat. We make use of mouse models and human tissues with a variety of techniques

to study cell function in diabetes – these techniques include metabolic characterization *in vivo* to identify genes and signalling pathways involved in glucose homeostasis. Moreover, we test the hypothesis that different diets, together with reduced cytokine signalling, will prevent insulin resistance in type 2 diabetes, and prevent β-cells from contributing to their own death in type 1 diabetes. The success of these experiments will result in taking these strategies to future clinical trials. Dr Esteban Gurzov has dedicated his scientific career to investigate the pathogenic mechanisms of diabetes and obesity and the discovery of novel therapeutics. He has developed an international reputation for his work in the field of metabolism and diabetes with publications in *Cell Metabolism, Nature Communications, Diabetes, Oncogene, Cell Death & Differentiation, JBC,* etc.

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