Institute of Medical Biology
A*STAR

Seminar Announcement

- All Are Welcome -

Speaker : **Dr Adrian Teo**
Joslin Diabetes Center and Harvard Medical School

Title : ***"Probing diabetes disease mechanisms with the use of human induced pluripotent stem cells"***

Date : 24 January 2014 (Friday)
Time : 11:00am – 12:00pm
Venue : Exploration Theatre, Matrix Level 4
Host : Dr Ray Dunn
(Tel: 64070164; E-mail: ray.dunn@imb.a-star.edu.sg)

Abstract:

Diabetes is a debilitating chronic disease which is spirally out of control. Despite intensive research, mechanisms underlying human pancreatic beta cell failure during the development of diabetes remain elusive due to the lack of access to patient material. Presence of species-specific differences between model organisms and humans, in pancreatic development and islet architecture also partly accounts for the knowledge gap. The discovery of human induced pluripotent stem cells (hiPSCs) now provide a unique opportunity to potentially produce mature functional pancreatic beta cells and various cell types of interest for 1) *in vitro* disease modelling of diabetes, 2) developing small molecules that can enhance human beta cell replication and even 3) cell replacement therapy.

Here, he will highlight their efforts in recruiting various types of diabetic patients, obtaining skin biopsies, deriving hiPSCs from these skin fibroblasts and characterising the hiPSCs. He will then illustrate their efforts in optimising a protocol for the directed differentiation of hiPSCs into pancreatic cells, going through the developmental stages of CXCR4+SOX17+ definitive endoderm, PDX1+ pancreatic progenitors and endocrine progenitors. Last but not least, he will also provide an example of subjecting these diabetic-hiPSCs through the pancreatic differentiation protocol for *in vitro* disease modelling of diabetes. Overall, it will be evident that disease modelling of human diabetes via the use of diabetic-hiPSCs will provide novel insights into the development of diabetes.

About the Speaker:

Adrian Teo, Ph.D., is currently a research fellow at Joslin Diabetes Center and Harvard Medical School. He obtained his BSc (1st Class Honours) from the National University of Singapore in February 2007. He then started to work on human embryonic stem cells (hESCs) with Ray Dunn, Ph.D., and Alan Colman, Ph.D., at ES Cell International Pte. Ltd., before joining the Institute of Medical Biology (IMB) for an internship as a Research Officer in the laboratory of Ray Dunn, Ph.D.. In April 2008, he joined the laboratory of Ludovic Vallier, Ph.D., at the University of Cambridge to pursue his Ph.D., under the A*STAR Graduate Scholarship (Overseas). Concurrently, he was also an Honorary Cambridge Commonwealth Trust Scholar. His thesis described how pluripotency factors regulate endoderm specification via key regulator *EOMESODERMIN*. He completed his Ph.D. in July 2010 and joined the laboratory of Ray Dunn, Ph.D., at IMB as a postdoctoral fellow before heading to the laboratory of Rohit Kulkarni, M.D. Ph.D., at Joslin Diabetes Center, Harvard Medical School in September 2011. During his fellowship at Joslin, he obtained two Harvard Stem Cell Institute seed grants and a Juvenile Diabetes Research Foundation (JDRF) fellowship to pursue his research interests in using human pluripotent stem cells (hPSCs) for *in vitro* disease modelling of diabetes.