Institute of Molecular and Cell Biology
A*STAR

SEMINAR ANNOUNCEMENT

We would like to invite you to attend this seminar hosted by Dr. Jonathan Loh:

Date: 4 November 2014, Tuesday
Time: 11:00AM – 12:00PM
Venue: Level 3, IMCB Seminar Room 3-46, Proteos, Biopolis

Speaker: Prof. Kenneth Zaret, Joseph Leidy Professor, Cell and Developmental Biology Dept., University of Pennsylvania School of Medicine, USA
Title: Basis for Reprogramming Cell Fate

The primary means of cell type control is by regulatory proteins (transcription factors) that bind to sites on chromosomes and govern the expression of genes specific for a given cell type. Yet chromosomes consist of DNA packaged into nucleosomes and higher-order protein complexes which create physical barriers to transcription factor binding and cellular reprogramming. We previously showed that a subset of transcription factors called "pioneer factors" can function in early development and are useful in cell reprogramming because they can invade silent chromatin. Using a combination of genomics, biochemistry, and molecular dynamic modeling, I will present new findings which show that pioneer factors are distinguished by the ability of their DNA binding domain to adapt to DNA on the nucleosome surface. This simple characteristic appears to define the ability of pioneer transcription factors to selectively bind nucleosomal DNA at silent genes and initiate cellular reprogramming. Understanding the mechanisms that underlie cell fate control will enhance efforts to reprogram cells for biomedical and therapeutic purposes.

Biography:
Kenneth S. Zaret, Ph.D. is the Director of the Institute for Regenerative Medicine and the Joseph Leidy Professor in the Department of Cell and Developmental Biology at the Perelman School of Medicine, University of Pennsylvania. His laboratory discovered “pioneer factors” that endow the competence for cell differentiation and promote cellular reprogramming. His laboratory also identified a signaling network that induces liver and pancreas cell fates in the mammalian embryo; the information is used by embryonic stem cell labs to generate hepatic and pancreatic beta cells. His laboratory further showed that signaling from endothelial cells is crucial for early liver and pancreas organogenesis. His group used stem cell technology to reprogram human pancreatic cancer cells and found that the reprogrammed cells can model pancreatic cancer progression. Dr. Zaret received a Searle Scholar faculty award (1986), the Hans Popper Basic Science Award from the AASLD and American Liver Foundation (2002), a MERIT award from the National Institutes of Health (2006-), and in 2007 he was elected as a Fellow of the American Association for the Advancement of Science.

ALL ARE WELCOME *(No registration required)*