



THE HONG KONG UNIVERSITY OF SCIENCE & TECHNOLOGY  
Division of Life Science

*LIFS Seminar Series*

Mammalian expanded potential stem cells, a  
new type of stem cell with totipotency features

by

Prof. Pentao LIU

*The University of Hong Kong, School of Biomedical Sciences,  
Stem cell and Regenerative Medicine Consortium*

Abstract:

Mouse embryonic stem cells derived from the epiblast contribute to the somatic lineages and the germline upon reintroduction to the blastocyst but are excluded from the extraembryonic tissues that are derived from the trophoctoderm (TE) and the primitive endoderm (PrE). By inhibiting signal pathways implicated in the earliest embryo development, we have recently established cultures of expanded potential stem cells (EPSCs) from individual 8-cell blastomeres, by direct conversion of mouse embryonic stem cells (ESCs) and induced pluripotent stem cells (iPSCs). A single EPSC can contribute to both the embryo proper and the TE lineages in chimera assay. *Bona fide* trophoblast stem cell (TSC) lines and extraembryonic endoderm stem (XEN) cells could be directly derived from EPSCs *in vitro*. Molecular analyses of the epigenome and single-cell transcriptome revealed enrichment for blastomere-specific signature and a dynamic DNA methylome in EPSCs. The knowledge of mouse EPSCs has enabled establishing EPSCs of other mammalian species such as human and pig, where pluripotent stem cells are not currently available. The EPSCs of these species have similar molecular features, and can differentiate to extraembryonic and embryonic cell lineages *in vitro* and *in vivo* in the case of pig EPSCs. Mammalian EPSCs may provide a new cell source for stem cell and embryo development research and for regenerative medicine.

**Date** : **6 April 2018 (Friday)**  
**Time** : **4:00 p.m.**  
**Venue** : **Lecture Theatre C**  
**The Hong Kong University of Science**  
**& Technology**  
**Clear Water Bay, Kowloon**

*(Host faculty: Prof. Danny Leung)*

***All are Welcome!!***