

Therapeutic applications of stem cells in cell therapy, regenerative medicine and drug discovery



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**BTI Boardroom
Level 6, Centros**

Hosted by Prof Lam Kong Peng

Seminar Abstract

Pluripotent stem cells possess the ability to differentiate into multiple lineages and hence are of tremendous therapeutic value. In this seminar, I will give you an overview of my research journey using pluripotent stem cells for (i) basic discovery research, (ii) genetic and drug discovery screens and (iii) cell therapy. Although somatic cells can be reprogrammed to an induced pluripotent state through overexpression of pluripotency factors or by nuclear transfer into oocytes, there remain significant roadblocks during the process. By using human and mouse nuclear transfer systems, we first demonstrate that cell-type-specific features of cell cycle progression constitute a major barrier to successful reprogramming, independent of gene expression remodeling. Secondly, through artificial activation of pathogenic oocytes, we successfully derived the world's first human haploid embryonic stem cells that can be used for forward genetic as well as drug screens. Lastly, I will describe work previously done at BTI on generating red blood cells from induced pluripotent stem cells for various therapeutic applications including blood transfusion as well as drug delivery.

About the Speaker

Dr Gloryn Chia is currently a senior scientist at Merck Sharp and Dohme (MSD), Translation Medicine Research Centre. Her current research interests include discovering and validating targets founded on human genetics in early drug discovery space. Prior to joining MSD, Dr Chia received her Ph.D. in Stem Cell Biology from the University of Cambridge and subsequently did her postdoctoral training at Columbia University under the A*STAR International Fellowship. Upon returning to Singapore, Dr Chia continued her research in cell therapy at the Bioprocessing Technology Institute, A*STAR. Her research interests include immunotherapy, cell therapy and the use of stem cells for disease modelling and regenerative medicine. She has published in several journals, including Nature, Nature Cell Biology and Development.