

SEMINAR

Fri, 19 Jan 2018 | 10am | DBS Conference Room 2

Hosted by Prof Gong Zhiyuan

Genomic dissection of the zebrafish heart



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The development of a vertebrate organ is complex, involving interactions between multiple signaling pathways at the molecular, cell and tissue levels. Heart development is an example of such complex process which, when disrupted, results in congenital heart defect. Although molecular pathways regulating heart development have been identified, there is still a lack of understanding of their downstream regulatory networks and how they interact. In addition, genetic factors are further regulated by epigenetic mechanisms, adding a layer of complexity in the process of heart development. In order to study the dynamics of gene regulatory network driving heart development, we employ genomics methodology to profile the transcriptome and epigenome of zebrafish cardiomyocytes using RNA-seq and ATAC-seq methods at different developmental stages in wild-type and heart mutants. Our analysis identified clusters of genes with distinct expression patterns and revealed the correlation between the dynamics of gene expression and changes in chromatin state during key stages of heart development. I will present our ongoing study on this topic and discuss the crosstalk between genetic and epigenetic regulation of heart development and potential insights it will contribute to understanding congenital heart diseases.

*The speaker is a DBS alumnus and she received B.Sc and Ph.D from NUS in 2004 and 2009 respectively.