



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

## ***LIFS Seminar Series***

### **“Molecular mechanism of miRNA biogenesis”**

delivered by

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Division of Life Science  
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#### **Abstract**

MicroRNAs (miRNAs), short and non-coding RNAs ~22 nucleotides in length, can find and silence the expression of a specific set of mRNAs, thereby regulating a variety of vital cellular processes, including stem cell differentiation and cancer maturation. The aberrant miRNA expression resulting from irregular miRNA biogenesis might lead to erroneous downregulation of mRNAs, subsequently causing cellular abnormalities. Thus, miRNA biogenesis must be accurately executed and regulated. This process is initiated by human Microprocessor, or the DROSHA-DGCR8 complex, that associates with various transacting factors to precisely and efficiently cleave the primary precursors of miRNAs (pri-miRNAs). Though Microprocessor has been studied for more than a decade, a molecular mechanism underlying its proper miRNA initiation remains elusive. In this seminar, I will present the latest model for pri-miRNA processing of human Microprocessor that is built by using multiple approaches, including biochemistry, biophysics, and X-ray crystal structure. The model demonstrates the complex stoichiometry and assembly, illustrates how the complex recognizes and interacts with the various secondary structures and primary sequencing motifs of the RNA substrates. The model not only clarifies a long-standing discrepancy over pri-miRNA processing mechanism but also substantially changes our current view of this mechanism. I will also talk about a molecular mechanism of trans-acting factors coordinating with Microprocessor in order to regulate pri-miRNA processing.

**Date** : 17 February 2017 (Friday)

**Time** : 4:00 p.m.

**Venue** : Padma & Hari Harilela Lecture Theatre (LT-C)  
HKUST, Clear Water Bay, Kowloon

*(Host faculty: Prof. Karl Herrup)*

*All are Welcome!*