香港浸會大學 HONG KONG BAPTIST UNIVERSITY

School of 中醫藥學院 Chinese Medicine

SCM Seminar

Structural, Kinetic, and Dynamic Studies of DNA Polymerases

Prof. Suo Zucai

Adjunct Professor, School of Chinese Medicine

Professor, Department of Chemistry and Biochemistry

The Ohio State University (OSU)

Date	:	19 Nov 2014 (Wednesday)
Time	:	4:00 p.m. – 6:00 p.m.
Venue	:	SCM 809
Language	:	English
Facilitator	:	Prof. Lu Aiping

Abstract

- Faithful replication of genomic DNA by DNA polymerases is crucial for maintaining the genetic integrity of an organism. If DNA becomes damaged, specialized lesion-bypass DNA polymerases are recruited to correct errors in the DNA. A variety of kinetic and structural studies have established a minimal kinetic mechanism common to all DNA polymerases. This mechanism includes several steps involving discrete protein conformational changes. However, the inter-relationship between conformational dynamics and enzymatic function has remained unclear, and identification of the rate-limiting step during nucleotide incorporation has been controversial. This seminar will describe new insights revealed about the dynamic nature of catalysis by DNA polymerases and how this information can be applied to understand DNA replication and maintenance in greater detail.

- Two L-nucleoside analogs, lamivudine and emtricitabine, have been widely used as anti-HIV and anti-hepatitis B drugs. The ternary crystal structures of human DNA polymerase λ in complex with L-deoxycytidine 5′-triphosphate, or its analogs (the triphosphates of lamivudine and emtricitabine) have been solved and will be described. This work provides a structural basis for the D-stereoselectivity of this polymerase and should enable the rational design of less toxic antiviral nucleoside analogs.

**** All are welcome ****