



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

Seminar Notice

“The activation mechanism of dynein-1 and the future of cryo-EM”

by

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Abstract

Cytoplasmic dynein-1 binds dynactin in the presence of cargo adaptor proteins to form a transport machine capable of long distance processive movement along microtubules. However, it is unclear why human dynein-1 moves poorly on its own and how dynactin activates movement. We successfully determined the cryo-EM structure of 23-subunit dynactin complex at near-atomic resolution. Dynactin assembly, the capping mechanism and its interaction with dynein were unambiguously revealed all at once. More importantly, the cryo-EM structure of the complete 1.4MDa human dynein-1 complex in the phi-particle state revealed a clear auto-inhibition mechanism. We find the open-form is also inhibited in an improper conformation for microtubule-based movement. Dynactin binding reorients the motor domains to interact correctly with microtubules and activates dynein. Our model explains how dynactin binding to the dynein-1 tail stimulates its motor activity directly.

Several topics of our recent technical development in cryo-EM will be briefly introduced. Personal perspectives on cryo-EM movie processing, contrast transfer function (CTF) and the potential power of cryo-EM for dynamic and *in situ* structural study will be discussed.

Date : 8 January 2018 (Monday)

Time : 3:30 p.m.

Venue : Room 4503 (Lifts 25-26)

The Hong Kong University of Science & Technology
Clear Water Bay, Kowloon

(Host faculty: Prof. Mingjie Zhang)

ALL ARE WELCOME!!