

臨時生物科学セミナー

日時：平成 23 年 11 月 4 日（金） 16:30~17:30

場所：理学部 2 号館 4 階講堂

講師：**Prof. Stephen M. King**

Department of Molecular, Microbial and Structural Biology,
University of Connecticut Health Center

演題：**Integrated Regulation of Axonemal Outer Arm Dynein**

要旨：

The outer dynein arm within cilia/flagella is a highly complex microtubule motor that responds to a variety of signaling cues including changes in Ca^{2+} , redox poise and mechanical state. These regulatory signals are detected through a series of accessory proteins that associate directly with one or more heavy chain motors. In addition, this complex interacts with the Lis1 protein which is thought to control the response of cytoplasmic dynein to high load conditions. We are trying to understand the molecular mechanisms involved in these regulatory systems within cilia/flagella and to determine how their effects are integrated by the outer arm to yield the required change in motor output.

In this seminar, I will provide an overview of the regulatory mechanisms that control axonemal dynein function. I will then discuss the role of the motor-domain associated LC1 protein and our recent results defining functional subdomains within this polypeptide. The data lead to a model that potentially integrates mechano-sensing and the response to high Ca^{2+} [1,2].

In addition, I will also detail some recent experiments which suggest that Lis1 levels in the flagellum are dynamically modulated in response to alterations in beat frequency imposed either by mutation, viscous load or reductive stress. This latter feature suggests that Lis1 may act as an additional regulatory input onto outer arm dynein.

[1] King. SM (2010)

Axonemal dyneins winch the cilium.

Nat Struct Mol Biol. 17(6):673-4.

[2] Patel-King RS, King SM. (2009)

An outer arm dynein light chain acts in a conformational switch for flagellar motility.

J Cell Biol. 186(2):283-95.