The 41st iCeMS

SEMINAR

CeMI Seminar Series 13

Wed 9 Dec 2009

15:00-17:00

Venue: 2nd floor Seminar Hall (#A207)
Main Building iCeMS Complex 1
Kyoto University

1st Lecturer: **Dr. Jonathon Howard**

Director and Group Leader (Professor)
Max Planck Institute for Molecular Cell Biology and Genetics
(Partner Institute of the iCeMS)

"Molecular Control of Cellular Size: Microtubule Length Regulation by the Depolymerase Kinesin-8"

2nd Lecturer: **Dr. Hans Oberleithner**

Professor, Institute of Physiology II
University of Münster

"Nanomechanics of Vascular Endothelium"

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Hosted by: iCeMS (Institute for Integrated Cell-Material Sciences), Kyoto University
The Institute for Frontier Medical Sciences, Kyoto University
Membrane Mechanisms Project, ICOPR-JST

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Abstracts

Prof. Joe Howard

Prof. Howard will present his recent discovery of a mechanism by which the cell length is controlled. The motor protein kinesin-8 disassembles longer microtubules faster than shorter ones. The longer the microtubule, the more motors land on it; the motors are so processive that almost all get to the plus end; and at the plus end each motor removes just a single tubulin dimer. Thus the depolymerization rate is proportional to the flux of motor to the end, which is proportional to the number of motors that land on the microtubule, which is proportional to the length of the microtubule. Thus kinesin-8 provides feedback from length back onto the polymerization dynamics, providing a molecular mechanism to control size up to the micron scale (Varga et al. Cell 2009).

Prof. Hans Oberleithner

The inner layer of blood vessels is made of endothelial cells which participate in the control of blood pressure and tissue perfusion. Shape, size and stiffness of endothelial cells changes with function. By using atomic force microscopy (AFM), Prof. Oberleithner measured these fundamental parameters in living cells and related them to specific functional states, clearly showing that relating nanomechanics to cellular function allows novel insights into the molecular mechanisms of blood pressure regulation.

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