



**NUS**  
National University  
of Singapore

Structural Biology & Functional Genomics Lecture Series

# Seminar Announcement

(Department of Biological Sciences & Office of Life Sciences, NUS)

## Lipid Dynamics in NEURONS



by

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The brain is the most cholesterol-rich organ in the body but little is known about the mechanisms that regulate cholesterol homeostasis in the brain. Recent evidence suggests that dysregulation of cholesterol balance in the brain might be related to the development of neurological diseases such as Alzheimer's disease and Niemann-Pick type C disease. We have utilized a unique compartmentalized model for culture of primary sympathetic neurons from rats and mice, and of retinal ganglion neurons from the central nervous system. In this culture system, cell bodies and distal axons reside in completely separate fluid environments and can be independently manipulated. I shall present data showing that cholesterol synthesis in neurons is important for normal axonal extension and that apolipoprotein E- and cholesterol-containing lipoproteins secreted by cortical glial cells stimulate axonal growth. In addition, we are studying the defect in cholesterol homeostasis in neurons derived from the murine model of the progressive neurological disorder, Niemann-Pick type C (NPC) disease. We have found that the cholesterol content of cell bodies of NPC1-deficient neurons is increased but is decreased in the distal axons, most likely because of a defect in the anterograde cholesterol transport into axons. We provide data supporting the idea that NPC1-deficient neurons exhibit a defect in synaptic vesicle recycling.

**Date:** 2 April 2004, Fri  
**Time:** 4 pm  
**Venue:** LT 20  
**Host:** Dr Liou Yih-Cherng

All are welcome