

**Department of Molecular and Cellular Biology**  
**DISTINGUISHED SPEAKER SEMINAR SERIES****Dr. L. Andrew Staehelin**

Professor, Molecular, Cellular and Developmental Biology  
University of Colorado at Boulder



**“Elucidating the nanoscale world  
of cells via electron tomography”**

**Wednesday, November 16, 2011**  
**at 12:30 p.m. in THRN 1307**

One of the central goals of 21st century cell biologists is to provide a seamless link of structural understanding between the macroscopic level of tissue organization to the molecular organization of the building blocks of cells and tissues. In turn, this structural knowledge provides architectural constraints for developing testable hypotheses for how molecular complexes, organelles and cells operate on a functional level. We have used a combination of state-of-the-art electron microscopy techniques, including high pressure freezing, electron tomography and novel immunogold-labeling methods, to define the nanoscale architecture of cellular structures and thereby provide a link between structures visualized by confocal microscopy, and atomic-scale information generated by x-ray crystallographers. The nanoscale resolution has enabled us to study macromolecular complexes (e.g. exocyst complexes) in a cellular context, and to quantify the number, surface area, volume and 3D organization of membranous compartments such as ER, Golgi and trans Golgi network cisternae and associated vesicles. In addition, we have been able to characterize ribosome-excluding scaffolding systems that encompass most secretory and endocytic membrane systems and help regulate local membrane activities such as COPII vesicle transfer from ER to Golgi cisternae, and the assembly of cell plates during plant cytokinesis.

References: Segui-Simarro, JM et al. (2004) *Plant Cell* 16, 836-856. Staehelin, LA and BH Kang (2008) *Plant Physiol.* 147:1454-1468. Kang, BH et al. (2011) *Traffic* 12:313-329.

*Host: Dr. John Greenwood*

*Coffee, Tea & Timbits*

**EVERYONE IS WELCOME TO ATTEND!**

*“A great opportunity to hear leading researchers in the scientific community discuss their work”*