



12th July 2013 - 14:00
CFEL, Building 99, seminar rooms I-III

Poul Nissen

Center for Membrane Pumps in Cells and Disease – PUMPKIN, Danish National Research Foundation
Aarhus University, Department of Molecular Biology and Genetics, Aarhus, Denmark
Danish Research Institute of Translational Neuroscience, Nordic-EMBL Partnership
for Molecular Medicine

XFEL studies of membrane transporters

The P-type ATPases establish and maintain electrochemical gradients for ions and lipids across membranes and are of key importance in the cell. They undergo large conformational changes in an E1-E2 cycle via formation and breakdown of a phosphoenzyme intermediate (E1P-E2P). Their activity is highly regulated by the lipid and ionic environment and by regulatory proteins. Similarly, neurotransmitter transporters perform active transport coupled to the electrochemical gradient for sodium.

We study several proteins of these transporter families, including also protein-protein complexes, by a combination of X-ray crystallography, biochemistry and electrophysiology. However, many of the relevant functional states are unstable. Furthermore, time-resolved studies would dramatically increase our insight of the transport mechanisms. Such questions can be addressed well by XFEL diffraction studies. Based on experiments performed at LCLS-CXI at SLAC we have gained significant, first insight of XFEL diffraction studies of microcrystalline samples with high lipid and detergent contents.

Hosts: Henry Chapman + Francesco Stellato - Coherent Imaging Division