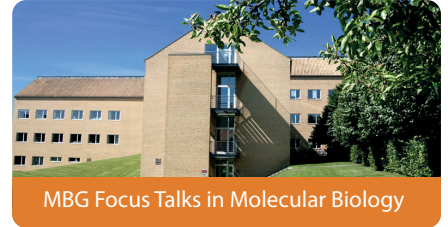


MBG FOCUS TALK

hosted by MBG - Structural Biology



Friday October 4th, 13:15-14:00

MBG Science Park Conference Room (3130-303), Gustav Wieds Vej 10

By Prof. Yifan Cheng

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Single particle cryo-EM of membrane proteins

With the rapid technological developments in the past few years, single particle cryo-electron microscopy (cryo-EM) has become the method of choice in structural biology of challenging biological macromolecules. In membrane protein structural biology, single particle cryo-EM has enabled rapid progresses in structure determinations, particularly so for many ion channels, transporters and cell surface receptors. Rapid progresses in structure determination enabled by single particle cryo-EM imposes new challenges to data interpretations. Using our own studies as examples, I will discuss the potential pitfalls in interpreting cryo-EM density maps.

As a prominent example in structural biology of membrane proteins, structural studies of transient receptor potential (TRP) channel superfamily demonstrated nicely how technological breakthroughs impacts scientific discoveries. Most TRP channels are non-selective cation channels with a few exceptions, such as TRPV5 (transient receptor potential vanilloid 5) and TRPV6. TRPV5 and 6 are highly selective for calcium. Unlike other TRPV subfamily members, TRPV5 and TRPV6 do not exhibit thermo-sensitivity or ligand-dependent activation but are constitutively open at physiological membrane potentials. Ion permeation is modulated by calmodulin (CaM) in a calcium-dependent manner. Structural studies of truncated and full-length TRPV5 in lipid nanodiscs, with a gating mutation and full length TRPV5 in complex with CaM provide novel insights to the mechanism of calcium regulation and reveal a flexible stoichiometry of CaM binding to TRPV5.

Hosted by Assoc. Prof. Bjørn P. Pedersen, MBG-AU