Room 406AB: Monday, February 17

10:30 AM – 12:00 PM
Cube Biotech Inc

Polymers in Structural Characterization of Membrane Proteins: Solubilization Efficiency Vs Stability and Nativity
Speaker: Nicholas Clark, Intramural Research Training Award (IRTA) Postdoctoral Fellow, Unit on Structural Biology, Division of Basic and Translational Biophysics, Eunice Kennedy Shriver National Institute of Child Health and Human Development, National Institutes of Health
Structural studies of membrane proteins necessitate solubilization, where insoluble membrane components become coated inside detergent micelles. Using detergents can be "successful" when solubilization efficiency and lipid replacement are needed, but recent development of amphipathic polymers created a different paradigm. The polymers do not solubilize, but rather create small native lipid-protein particles. The advantage of polymer extraction is the lack of exogenous lipids, allowing structure determination of lipid-protein complexes in a more native state and clarifying the functional role of lipids. Solubilization efficiency may not be the best success metric when compared to the increased protein stability provided by native lipids.

Revealing the True Importance of the Lipid Environment with the NativeMP™ Copolymer Suite for Membrane Proteins
Speaker: Philipp Hanisch, Head of Laboratory, Cube Biotech Inc
Integral membrane proteins are at the center of cellular function—controlling molecular flow, facilitating signaling, and mediating interactions with the environment. Their critical role makes them indispensable targets in drug development. Yet, studying these proteins remains notoriously challenging. Traditional detergents often strip away the native lipids that stabilize these proteins, leading to destabilization and limited success in advanced assays or structural studies.

Join me as I introduce the next leap in membrane protein research: copolymers. At Cube Biotech, we leverage the NativeMP™ platform, which employs next-generation copolymers like AASTY, Ultrasolute™ Amphipol (CyclAPol), and Cubipol, alongside SMA and DIBMA, to create stable native nanodiscs. These copolymers not only outperform traditional detergents but also preserve vital lipid interactions, providing unmatched protein stability.

I'll also demonstrate how NativeMP™ supports antibody generation through immobilization and how it supports advanced assays, including SPR, MST, Thermal Shift, and DEL. Additionally, I'll share insights into preparing samples for cryo-EM, achieving remarkable resolution and enhanced stability, and discuss recent successes in small molecule discovery.

Ion Channel Membrane Mimetics: Cryo-EM and Beyond
Speaker: Steven Molinarolo, Research Associate, University of British Columbia, Department of Biochemistry and Molecular Biology
This presentation examines the use of membrane mimetics to deepen our understanding of ion channels, with a focus on the Ryanodine Receptor, a key calcium channel in muscle contraction. Advances in cryo-electron microscopy (cryo-EM) have allowed high-resolution structural studies of these channels in near-native environments. However, fully understanding the functional dynamics of the Ryanodine Receptor requires an integrated approach. By leveraging membrane mimetics and combining structural insights with complementary analytical techniques, we aim to shed light on the interactions of ion channels within complex cellular environments.