



### Esplanade Room 157: Sunday, February 22

11:30 AM – 1:00 PM

Cube Biotech GmbH

Membrane proteins are central to physiology and drug discovery, yet their purification and stabilization remain major bottlenecks. Preserving native lipid interactions, oligomeric states, and conformational integrity is essential for meaningful structural and functional characterization. This Cube Biotech panel brings together experts who are advancing membrane protein workflows—from automated high-throughput purification strategies to native-state stabilization and structural applications in crystallography and resistance biology.

#### **Automation of Membrane Protein Purification: Rapid NativeMP™ Workflows from Single Targets to Screening Panels**

**Speaker:** *Philipp Hanisch, Head of Laboratory, Cube Biotech GmbH*

We present an integrated automation platform that combines solubilization, stabilization, and purification of membrane proteins in a streamlined workflow scalable from beginner to expert level—and from a single membrane protein to an entire target panel within just two hours.

By integrating high-throughput solubilization screening with NativeMP™ technology and magnetic bead purification, our platform enables parallelized condition screening while preserving native lipid environments and oligomeric integrity. This approach reduces hands-on time, increases reproducibility, and allows systematic identification of optimal extraction conditions before downstream structural or functional studies.

#### **Bypassing Trafficking Defects: Amphipol-Mediated Delivery of Truncated TRPV1 to Human Cells**

**Speaker:** *Wade Van Horn, Arizona State University*

Mechanistic studies of ion channels and other membrane proteins are frequently hindered by trafficking defects in disease-causing mutations, naturally occurring splice variants, and engineered biophysical constructs. This presentation explores amphipol-mediated delivery to introduce truncated TRPV1 variants into human cells while preserving structural integrity and functional responsiveness. By stabilizing the native protein fold and its associated lipid environment, amphipols enable controlled cellular delivery and functional interrogation of membrane protein constructs otherwise lost to biological quality control pathways.

#### **Structural Studies of Bacterial Membrane Enzymes Linked to Polymyxin Resistance**

**Speaker:** *Vasileios Petrou, Rutgers New Jersey Medical School (NJMS)*

Polymyxin resistance is driven by membrane-embedded enzymatic systems that remodel bacterial membranes. This talk presents structural investigations of key membrane enzymes involved in lipid A modification pathways. By combining structural and functional analyses, these studies provide mechanistic insight into resistance development and reveal potential strategies for targeting membrane-associated resistance determinants.

#### **Preserving Native Oligomeric States of Membrane Proteins with NativeMP™ Copolymers**

**Speaker:** *Evgeniya Demchenko, University of Chicago*

Detergent extraction often disrupts native oligomeric assemblies critical for membrane protein function. This presentation demonstrates how NativeMP™ copolymers enable direct extraction from biological membranes while maintaining lipid interactions and native oligomeric states. Comparative analyses highlight how preservation of native assemblies impacts downstream structural and functional characterization.

#### **Native-MP-Facilitated GPCR Crystallization Using Lipidic Cubic Phase**

**Speaker:** *Aleksey Raskovalov, University of Southern California*

G protein-coupled receptors remain challenging structural targets due to conformational instability outside the membrane. This presentation highlights how Native-MP-based stabilization strategies enhance GPCR preparation for lipidic cubic phase crystallization. Maintaining native-like lipid environments prior to crystallization improves conformational stability and supports high-resolution structural determination of pharmacologically relevant receptor states.