

DANDRITE Topical Seminar / MBG Focus Talk

Wednesday 24th February 2016, from 14:15 – 15:00

Conference room 303, building 3130, 3rd floor
Aarhus University, Dept. Molecular Biology and Genetics,
Gustav Wieds Vej 10C, 8000 Aarhus C



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The Saposin lipoprotein nanoparticle system for membrane proteins

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Membrane proteins are of outstanding importance in biology and drug development. However, membrane proteins are difficult to study due to their instability and tendency to aggregate when extracted from their natural lipid bilayer environment. In order to maintain their integrity, an artificial hydrophobic environment is needed. Detergent micelles are commonly used to solubilize membrane proteins, but often have adverse effects on protein activity, stability and solubility, and can interfere with the experimental set-up.

Here, we present a Saposin-lipoprotein nanoparticle system, Salipro, which allows for the reconstitution of membrane proteins into a lipid environment that is stabilized by a scaffold of Saposin proteins. The Salipro system allows for the incorporation of a variety of lipids, pro-/eukaryotic membrane proteins and viral antigens such as the HIV-spike into homogenous and soluble lipoprotein complexes.

We showcase the applicability of the method on prokaryotic and eukaryotic membrane proteins as well as by the direct solubilization and nanoparticle incorporation of a viral membrane protein complex from the virus membrane.

Our approach facilitates high-resolution structural studies of membrane proteins by single-particle electron cryo-microscopy (cryo-EM) and allows to stabilize the HIV-envelope glycoprotein in a functional state. The Salipro system provides a novel versatile nanoparticle platform for membrane proteins and may offer a wide range of potential applications, ranging from structural biology to the discovery of new pharmacological agents as well as the therapeutic delivery of protein-based therapeutics and vaccines.

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Host:

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