Bilayers at the ILL

Contribution ID: **24** Type: **Oral presentation**

DNA-tagged lipid bilayers: novel nano-scaled membrane-mimetic systems

Thursday, 12 December 2019 10:00 (20 minutes)

Lipid bilayers and lipid-associated proteins play a crucial role in biology. Since studies and manipulation in vivo are inherently challenging, several in vitro membrane-mimetic systems have been developed to enable the study of lipidic phases, lipid-protein interactions and membrane protein function. Controlling the size and shape or introducing functional elements in a programmable way is, however, difficult to achieve with common systems based on polymers, peptides or membrane scaffolding proteins. We have combined DNA-nanotechnology with lipid bilayer self-assembly to create DNA-encircled bilayers (DEBs) as a novel nano-scaled membrane-mimetic. For this, alkylated oligonucleotides were hybridized to a single-stranded minicircle (ssMC) to provide an inner hydrophic surface for lipid attachment. DEBs open new routes to membrane biophysical studies, enabling improved size control, stability and programmability[1]. Here, we present further developments of DNA-associated lipid bilayers for the reconstitution of membrane proteins and for the generation of self-assembled higher order structures. The latter may be ultimately used for the structural biology of membrane proteins in Cryo-EM or in diffraction experiments using advanced X-ray sources, such as synchrotrons or XFELs.

1. K. Iric, M. Subramanian, et al. Nanoscale 10 (2018) 18463-18467

Primary authors: SUBRAMANIAN, Madhumalar (Helmholtz-Zentrum Dresden Rossendorf); OERTEL, Jana (Helmholtz-Zentrum Dresden-Rossendorf); FAHMY, Karim (Helmholtz-Zentrum Dresden-Rossendorf)

Presenter: FAHMY, Karim (Helmholtz-Zentrum Dresden-Rossendorf)

Session Classification: Session C