Synthetic Membrane Systems

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Synthetic Membrane Systems: Positions are available

Within the newly founded group in the Institute of Biochemistry, Heinrich-Heine-University Düsseldorf, we employ membrane-reconstituted systems of varying complexities to study vital biological processes downto single-molecule level. Recent developments in synthetic membranes, such as nanodiscs, SMALPs and giant vesicles, allow us to conduct a comprehensive biochemical, biophysical and structural analysis on membrane proteins and their complexes in physiologically-relevant environments. With that we are aiming to elucidate conformational dynamics and macromolecular assembly of cellular machineries dedicated to protein folding, transport, and degradation, in native-like custom-tailored lipid membranes, as well as scrutinize roles of the lipid environment in protein functioning and regulation.

Currently, we are looking for Master and PhD students to study effects of macromolecular crowding on membrane protein insertion and folding mediated by the Sec translocon. Within the project we are developing *de novo* protein:membrane systems, which mimic the complexity of biological membranes, and investigate the membrane protein biogenesis pathway that includes ribosome targeting to the Sec system, functional dynamics of reconstituted Sec translocons, and the protein transports/insertion reactions. The project will be further supported by collaborations with groups specialized in computational biology, single-molecule biophysics and polymer synthesis.

The applicants are expected to have an experience in (membrane) protein biochemistry and/or mathematical modeling of biological processes. Please, send your applications, incl. CV, previous work experience and references to:

Synthetic Membrane Systems (AG Kedrov)

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Selected publications:

Kedrov *et al.* (2016) Structural dynamics of the YidC insertase upon membrane protein insertion. *Cell Rep,* 17, 2943-54.

Beckert *et al.* (2015) Structural basis for SRP-dependent protein targeting and elongation arrest in prokaryotes. *Nat Struct Mol Biol,* 20, 767-73.

Kedrov *et al.* (2013) Elucidating the native architecture of the YidC: Ribosome complex. *J Mol Biol* 425, 4112-24.

Kedrov *et al.* (2011) A single copy of SecYEG is sufficient for preprotein translocation. *EMBO J* 30, 4387-97.