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## Structure and Dynamics of Membrane Proteins in a Native Environment

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Membrane proteins are important players in signal transduction and the exchange of metabolites in cells. Thus, this protein class is the target of around 60% of currently marketed drugs, emphasizing their essential biological role. Besides production issues, a major bottleneck encountered in the structural characterization of membrane proteins is identifying a suitable membrane mimetic that provides a native environment. Thus, we are actively developing the phospholipid nanodisc technology for solution-state NMR spectroscopy. This versatile and size-tunable membrane mimetic provides a planar lipid bilayer membrane and can be used to study structure, dynamics and function of integral as well as peripheral membrane proteins. In this talk, our recent advances in the field of nanodisc development will be discussed as well as studies on the structure and dynamics of membrane proteins in suitable membrane mimetics, covering G-protein coupled receptors (GPCRs) and their complexes with G-proteins, a  $\gamma$ -Secretase substrate, the mitochondrial membrane protein VDAC1 as well as its counterpart in chloroplasts, called OEP21. These examples will emphasize the importance of choosing a suitable membrane mimetic for a particular application and membrane protein system.

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