NMR Studies of Integral Membrane Proteins

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Structural studies of membrane proteins are still hampered by problems in finding appropriate membrane mimetics that maintain structure and function of the embedded systems. While most studies of membrane proteins use detergent micelles as membrane mimetics these may have destabilizing effects for extra-membrane moieties of receptors. More seriously, detergent micelles may be unsuitable for interaction studies of integral membrane proteins with soluble binding partners. To address this problem we have investigated the use of amphipoles and phospholipid nanodiscs and studied both β-barrel and helical membrane proteins. This included the voltage-dependent anion channel VDAC, OmpX, a helical inner mitochondrial membrane protein and a GPCR/G-protein system.

To enhance performance of NMR on these large systems we optimized methods for NMR data acquisition and processing. A selection of these methods will be presented.