Contribution ID : **19** Type : **not specified**

Keynote 8, Prof. Henning Tidow: Structural studies of integral membrane proteins using stealth carrier nanodiscs

Thursday, 10 October 2019 16:50 (40)

Structural studies of integral membrane proteins (IMPs) are challenging, as many of them are inactive or insoluble in the absence of a lipid environment. We pioneered an approach making use of fractionally deuterium labelled 'stealth carrier' nanodiscs that are effectively invisible to low-resolution neutron diffraction and enable structural studies of IMPs in a lipidic native-like solution environment. We show the potential of the method in a joint small-angle neutron scattering (SANS) and X-ray scattering (SAXS) study of the ATP-binding cassette (ABC) transporter protein MsbA solubilized in the stealth nanodiscs. The data allow for a direct observation of the signal from the solubilized protein without contribution from the surrounding lipid nanodisc. Not only the overall shape but also differences between conformational states of MsbA can be reliably detected from the scattering data, demonstrating the sensitivity of the approach and its general applicability to structural studies of IMPs. In a follow-up project, we could also apply this method to investigate the structural basis for the activation of an essential Ca2+-pump by its regulator calmodulin.
This methodology can be applied to other classes of integral membrane proteins and paves the way for low-resolution structure determination of IMPs in solution using both ab initio and rigid body analysis approaches.

Presenter(s) : Prof. TIDOW, Henning (Hamburg University)

Session Classification : Keynotes and Short talks 6