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Dipole Organization and Membrane Biophysics: A Tale of Two Studies

Biological membranes are complex assemblies of lipids and proteins that allow cellular compartmentalization and act as an interface, through which cells communicate with each other and with the external milieu. In physical terms, membranes can be treated as a complex oriented fluid which is a weakly coupled, non-covalent, and anisotropic assembly of molecules in two-dimensions, and can therefore be treated as soft matter.

In this lecture, I will focus on the application of red edge excitation shift (REES) and membrane dipole potential to explore organization and dynamics of membrane lipids and proteins. Both these phenomena are dependent on organization of membrane dipoles.

References:

1. Haldar, S., Chaudhuri, A., and Chattopadhyay, A. (2011) *J. Phys. Chem. B* 115: 5693-5706 (Feature Article).
2. Chattopadhyay, A., and Haldar, S. (2014) "Dynamic Insight into Protein Structure utilizing Red Edge Excitation Shift" *Acc. Chem. Res.* 47: 12-19.
3. Haldar, S., Kanaparthi, R.K., Samanta, A., and Chattopadhyay, A. (2012) *Biophys. J.* 102: 1561-1569.
4. Lajevardipour, A., Chon, J.W.M., Chattopadhyay, A., and Clayton, A.H.A. (2016) *Sci. Rep.* 6: 37038.
5. Sarkar, P., Chakraborty, H., and Chattopadhyay, A. (2017) *Sci. Rep.* 7: 4484.

Prof. Amitabha Chattopadhyay received his Ph.D. degree in Chemistry from the State University of New York at Stony Brook in 1987. In 1987 Prof. Chattopadhyay joined the Centre for Cellular and Molecular Biology (CCMB) in Hyderabad and now is a SERB Distinguished Fellow there. He is an elected Fellow of Fellow of The World Academy of Sciences, Royal Society of Biology, Royal Society of Chemistry, and all the Indian Academies of Science. Prof. Chattopadhyay has authored close to 250 research publications (mostly as first or senior/corresponding author; total citations > 10,200, h-index 54, i-10 index 179), two monographs, and national and international patents.

All interested colleagues are welcome to this seminar lecture (45 min. presentation followed by discussion)

Friedrich Aumayr
(LVA-Leiter)

Gerhard Schütz
(Seminar Chair)