

X-ray and Neutron Scattering for Health and Disease

Maikel Rheinstadter, Department of Physics and Astronomy, McMaster University, Hamilton ON, Canada, rheinstadter@mcmaster.ca

Our lab is running a research program in membrane biophysics. We use X-ray and neutron beams to study molecular structure and dynamics in membranes in-situ, under physiological conditions [1]. We study nanoscale diffusion within and across membranes, the effects of small molecules on membrane properties, the interaction with common drugs, such as aspirin, ibuprofen and cortisone, and their side effects. We detect and characterize membrane rafts and peptide interactions in Alzheimer's disease. Experiments are complemented by molecular dynamics computer simulations. The possibility to highlight certain molecules or molecular components in neutron scattering experiments through selective deuteration plays a key role to gain detailed structural and dynamical information. I will talk about current topics in membrane biophysics, nano- and personalized medicine, the associated experimental challenges and present exciting recent results and biomedical applications.

References

1. <http://www.rheinstaedter.de/maikel/publications/publications.htm>