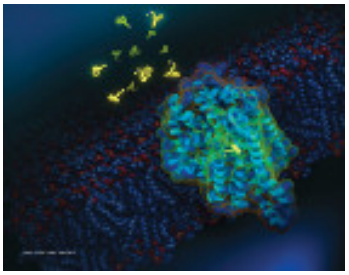

Contribution ID: **28** Type: **not specified**

# Anomalous and anisotropic diffusion of hydration water in fluid lipid membranes

We report on diffusion of hydration between phospholipid membranes using incoherent quasi-elastic neutron scattering (QENS) and computer simulations [1]. The combination of a well-aligned stack of DMPC membranes with the large, 2-dimensional detectors available at the neutron spectrometer Let (ISIS, UK) allows for simultaneous access to water motions lateral and perpendicular to the membranes. The resulting 2-dimensional maps of relaxation time and stretching exponent evidence anomalous (sub-diffusive) and anisotropic diffusion of membrane hydration water varying on nanometer distances. By combining molecular dynamics and coarse-grained Brownian dynamics simulations, the overall behavior is reproduced, and the apparent features can be linked back to an intrinsic sub-diffusivity of water at picosecond time scales, and the anisotropy of confinement and local dynamical environments.
[1] Toppozini et al. Soft Matter 11 (2015) 8354

**Authors:** TOPPOZINI, Laura (McMaster University, Hamilton, Ontario, Canada); ROOSEN-RUNGE, Felix (Division for Physical Chemistry, Lund University); Dr GARCIA SAKAI, Victoria (ISIS, STFC, Rutherford Appleton Laboratory, Harwell, Oxfordshire, UK); RHEINSTÄDTER, Maikel (McMaster University, Hamilton, Ontario, Canada)

**Presenter:** ROOSEN-RUNGE, Felix (Division for Physical Chemistry, Lund University)