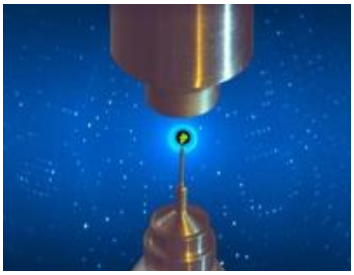

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Influence of NaCl on Phospholipid membranes

Wednesday, 9 June 2021 14:20 (20 minutes)

Understanding the structure and dynamics of phospholipid membranes is of paramount importance for biophysics, biology and medical sciences. Virtually every living organisms is comprised of several of those membranes that provide a variety of functions, ranging from the separation of volumes to more complex functions like nutrient or information transport across the membrane.
All those functions are linked both to the structure and dynamics of the membrane itself. In this contribution we present the combination of a well-studied model membrane of L-alpha-phostatidylcholine (SoyPC) and NaCl. We were able to determine the location of the ions, their influence on the structure of the membrane and subsequently how this change in structure impacts the dynamics of the membrane. This was done by means of neutron reflectometry, grazing-incidence small-angle neutron scattering (GISANS) and grazing-incidence neutron spin-echo spectroscopy (GINSES).
We were able to show that the ions will concentrate along the boundary of the headgroup-water interface, more or less pronounced as a function of concentration and temperature. This change we linked to a distinctive increase in mobility along the membrane surface with increasing concentration.
This information we can now use to better judge our model systems and differentiate in-vitro between salt-free and physiological conditions. Also, this allows further research on the impact of small ionic molecules on phospholipid membranes.

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