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## Studies of the localization of small molecules in self-assembled lamellae structures by neutron diffraction and molecular deuteration

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The self-assembly of biological amphiphilic molecules, lipids, into lamellar structures, forms the basis of a selective transport barrier around the cell cytoplasm, the lipid bilayer. Neutron diffraction, when combined with molecular deuteration, provides an important high resolution tool in the understanding the localization of molecules in this structure. This paradigm, a description of the locus of a molecule within the bilayer structure, can provide important mechanistic insight into biological problems such as the mode of action of cryoprotectants, the interaction of cell penetrating peptides or the relationship between organization and barrier properties of skin lipids in inflammatory conditions. MIRA is a cold triple axis spectrometer, when used as a two-axis diffractometer, is well suited for the measurement of lamellar diffraction with low background. The use of MIRA in the context of the above examples is discussed.

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