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Large soft matter unit cell reconstructions from x-ray and neutron scattering data

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Fourier methods may be used to reconstruct the scattering length density profile of the unit cell from neutron and x-ray diffraction measurements thus yielding information about the distribution of chemical component. Deuteration of the sample components can be used for phasing of the Fourier reconstruction or to provide contrast between components in bilayer stacks¹. We discuss the application of selective deuteration of various components of the lipid bilayer and the application of such methods to systems of higher dimensionality such hexagonal and cubic phases and the use of anomalous (energy dependent) diffraction as a means of obtaining phase information.

1. Kent, B.; Hunt, T.; Darwish, T. A.; Hauß, T.; Garvey, C. J.; Bryant, G., Localization of trehalose in partially hydrated DOPC bilayers: insights into cryoprotective mechanisms. *Journal of The Royal Society Interface* 2014, 11 (95).

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