Contribution ID: **100** Type: **Poster**

Developing advanced models of biological membranes with hydrogenous and deuterated natural glycerophospholipids

Cellular membranes are complex systems including hundreds of different lipid species. Their investigation often relies on simpler model systems including fewer synthetic lipid species. Glycerophospholipids (GPLs) extracted from cells are a valuable resource to produce more advanced models of biological membranes. Here we present the optimization of a method previously reported by our team for the extraction and purification of GPLs from P. pastoris. The implementation of an additional purification step by High Performance Liquid Chromatography-Evaporative Light Scattering Detector enabled a better separation of the GPLs from neutral lipids such as sterols, and also allowed the GPLs to be purified according to their different polar head classes. For this study we produced phosphatidylcholine (PC), phosphatidylserine (PS) and phosphatidylglycerol (PG) mixtures. These exhibit a single composition of the polar head, i.e. PC, PS or PG, but contain acyl chains of varying lengths and unsaturation's, which was determined by Gas Chromatography- Flame Ionization Detection. The lipid mixtures were produced both in their hydrogenous and deuterated versions and used to form lipid bilayers both on solid substrates and as vesicles in solution. The supported lipid bilayers were characterized by quartz crystal microbalance with dissipation monitoring and neutron reflectometry, whereas the vesicles by small angle X-ray and neutron scattering. Our results show that despite a small difference in the acyl chain composition, the hydrogenous and deuterated extracts produced bilayers with very comparable structure, which makes them valuable to design experiments involving selective deuteration with techniques such as NMR, neutron scattering or infrared spectroscopy.

Session

Interaction lipids/polymers/membrane proteins

Primary authors: Dr BATCHU, Krishna (ILL); Mr CORUCCI, Giacomo (ILL); Dr LUCHINI, Alessandra (University of Perugia); Dr SANTAMARIA, Andreas (ILL); Dr FREWEIN, Moritz (ILL); Mrs LAUX, Valerie (ILL); Dr MARTEL, Anne (ILL); Dr PORCAR, Lionel (ILL); Dr FRAGNETO, Giovanna (ILL)

Presenter: Dr BATCHU, Krishna (ILL)

Session Classification: Clip Session