**Grant Number**: BB/M01116X/1, BB/J014532/1, BB/T00746X/1, EP/D05561X/1

**Sponsor:** BBSRC, EPSRC, Royal Society

The following folders of data have been archived:

|  |  |
| --- | --- |
| **Folder name** | **Description** |
| Isotherm\_PEPS\_ALM.zip | Contains the files that are opened by Nima trough software and the corresponding ascii files for the isotherms. The ascii files can be opened in any suitable data analysis software. Folder also contains a .txt file with information on the lipid solutions used in the measurement, to enable calculation of area per molecule from the provided data. |
| Echem\_PEPS\_ALM.zip | Our software outputs ascii files directly. This folder contains ascii files for the current transients used to calculate the charge density vs potential plots, divided into a subfolder for each monolayer type. A .txt file is included to explain how to convert the raw data to the data presented in the paper. |
| PMIRRAS\_PEPS\_ALM.zip | Contains three subfolders and a .txt file with information on how the data are used (refers to an online resource for the details).  One subfolder contains the optical constants. The other subfolders are named for each lipid composition. Within these are subfolders named after the relevant vibrational mode and contain data from in situ PM-IRRAS experiments. Within each of those are subfolders containing the data for replicate measurements (the spectrometer's files and ascii files are both provided). The .txt file explains the naming of the files within these folders. |
| BAM\_PEPS\_ALM | Contains a subfolder for each composition and a .txt file with a list of filenames that correspond to each composition and molecular area. Within each subfolder are the recorded .png files and associated .png.info files that software such as ImageJ (which is free) uses to interpret the scale. |
| GIXD\_PEPS\_ALM | Contains a subfolder for each lipid composition and a .txt file, which gives the filenumbers and the image detector filenames for each image. This file also gives instrumental parameters and a procedure for scaling the image files (to convert pixel number to a value of momentum transfer in each direction). Each subfolder is further subdivided into a subfolder for each surface pressure or molecular area studied. Within each subfolder, each diffraction dataset is associated with one .dat file and two detector image files (each with its own metadata file). The .dat file in the parent GIXD folder provides the relevant detector image filenumbers for each image. |
| XRR\_PEPS\_ALM.zip | Contains a subfolder for subfolder for each lipid composition, each of which is divided into a folder containing normalisation scans and a folder containing the sample XRR measurements. Each of those folders contains a subfolders for each surface pressure or molecular area studied. Within these can be found a .dat file and the associated detector image files. The .dat files already contain the data extracted from the image files to be used for data reduction to reflectivity *vs* momentum transfer. The XRR parent folder also contains a .txt file to explain the procedure for data reduction and a .txt file listing the filenumbers for sample measurements and the normalisation files used. |
| NR\_PEPS\_ALM.zip | Contains a subfolder for each lipid composition and two subfolders containing calibration data for each experiment. The measurement subfolders are subdivided by the surface pressure or molecular area studied. Within these are contained .dat files corresponding to the reduced data for each contrast measured and the associated .nxs files. Those files can also be found from the ISIS website; the urls are provided in the .txt file in the parent folder. The .txt file gives a list of which file run numbers belong to each contrast (the .dat files are named after the run numbers). |

**Publications related to the dataset**: Effect of Anionic Lipids on Mammalian Plasma Cell Membrane Properties (under review).