

## Supplementary Figures



Figure S1. Structures of the glycolipids investigated in our neutron diffraction experiments.

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**Figure S2.** Overview of the neutron diffraction data on aligned multilayers of DPPC membranes doped with 10 mol% glycolipids of different types in the presence and absence of 5 mM CaCl<sub>2</sub>. For each sample, the figure shows a map of the scattered intensity as a function of  $\Gamma$  and  $\Omega$  alongside with a plot of the  $\Omega$ -integrated intensity vs.  $\Gamma$ . The intensity maps have a logarithmic color code. Solid lines in the plots are linear interpolations to guide the eye. Peak positions were obtained through Gaussian fits to the  $\Omega$ -integrated intensities in a narrow interval close to the intensity maximum.