

### Supporting Information:

#### Phase separation in Ceramide [NP] containing lipid model membranes: Neutron diffraction and solid-state NMR

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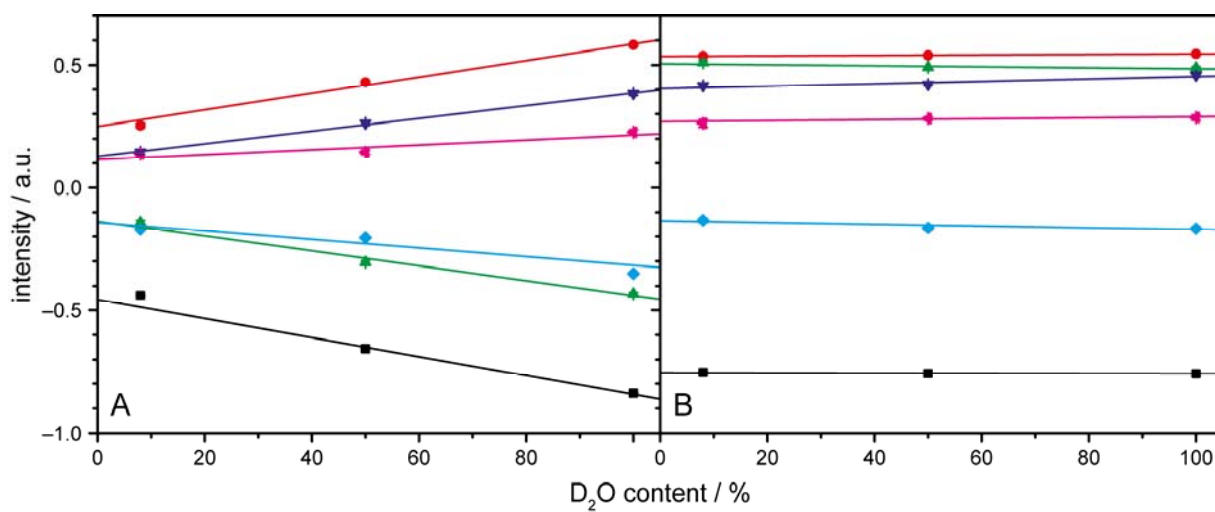
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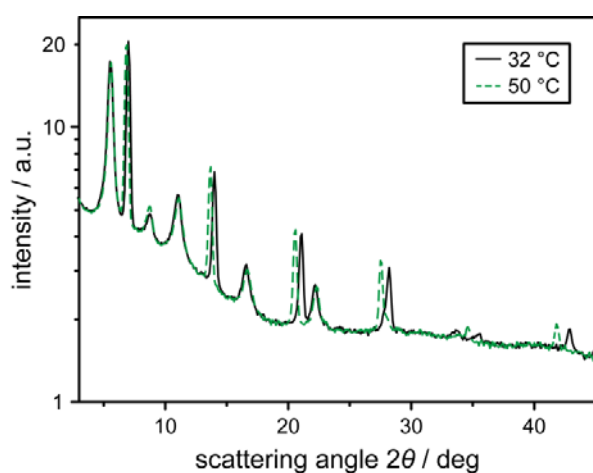
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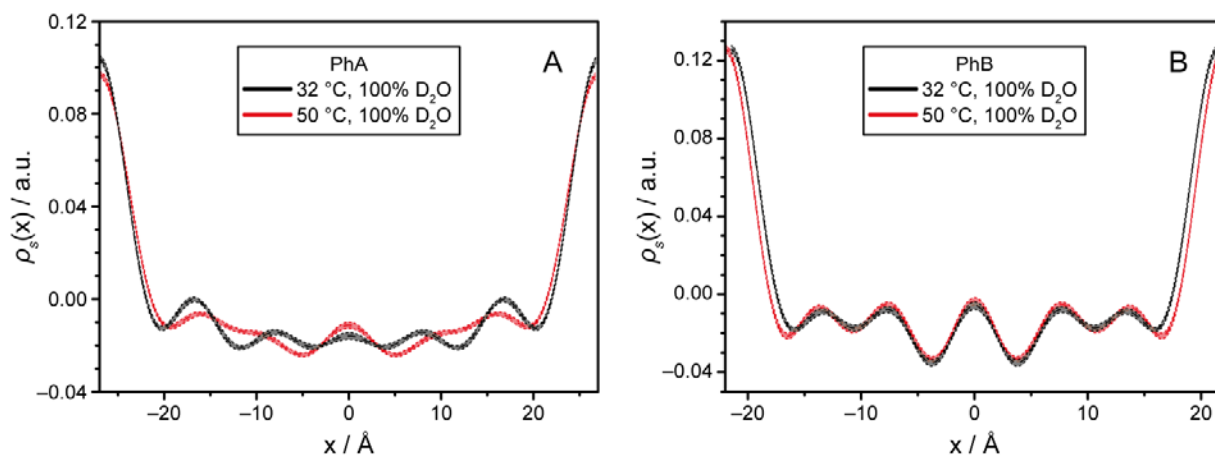
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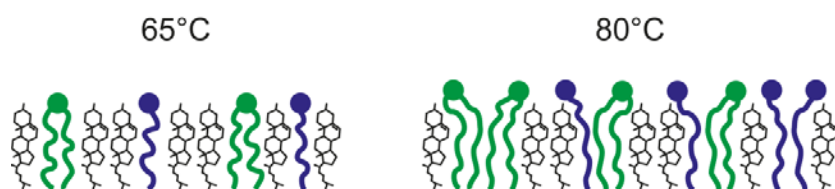
**Fig. S1** Dependence of the structure factors of PhA (A) and PhB (B) of the model membrane composed of CER[NP]-C24/CHOL/TA (1:1:1 mol/mol) on the D<sub>2</sub>O content at 32°C and 57% RH. Data is shown for orders 1 (black), 2 (red), 3 (green), 4 (dark blue), 5 (light blue) and 6 (pink).



**Fig. S2** Comparison of the neutron diffraction pattern of the model membrane composed of CER[NP]-C24/CHOL/TA (1:1:1 mol/mol) measured at 32°C (black solid line) with the pattern of the same sample at 50°C (dashed green line) measured at 100% D<sub>2</sub>O.



**Fig. S3** Comparison of the NSLD profiles of PhA (A) and PhB (B) of the model membrane composed of CER[NP]-C24/CHOL/TA (1:1:1 mol/mol) at 50°C and 32°C. All profiles were determined at 57% RH and 100% D<sub>2</sub>O.



**Fig. S4** Cartoon representation of the liquid-crystalline phase observed in the NMR spectra at 65°C and 80°C. At 65°C large portions of CER[NP] and TA are still in a crystalline phase. Therefore, the liquid-crystalline phase has a very high CHOL concentration and the few CER[NP] and TA molecules present adapt their length to CHOL. As the crystalline phase almost completely vanishes at 80°C more CER[NP] and TA molecules are added to the liquid-crystalline phase reducing the cholesterol concentration. Therefore, the influence of CHOL on the other molecules is reduced and leads to an increase in their order.