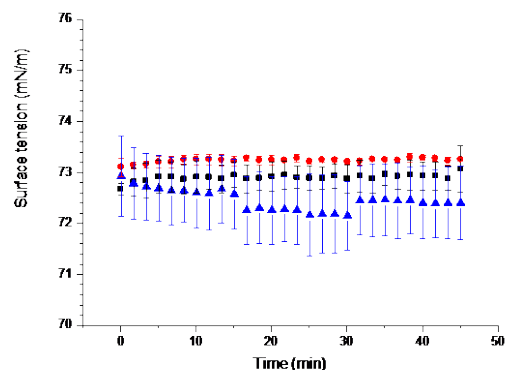


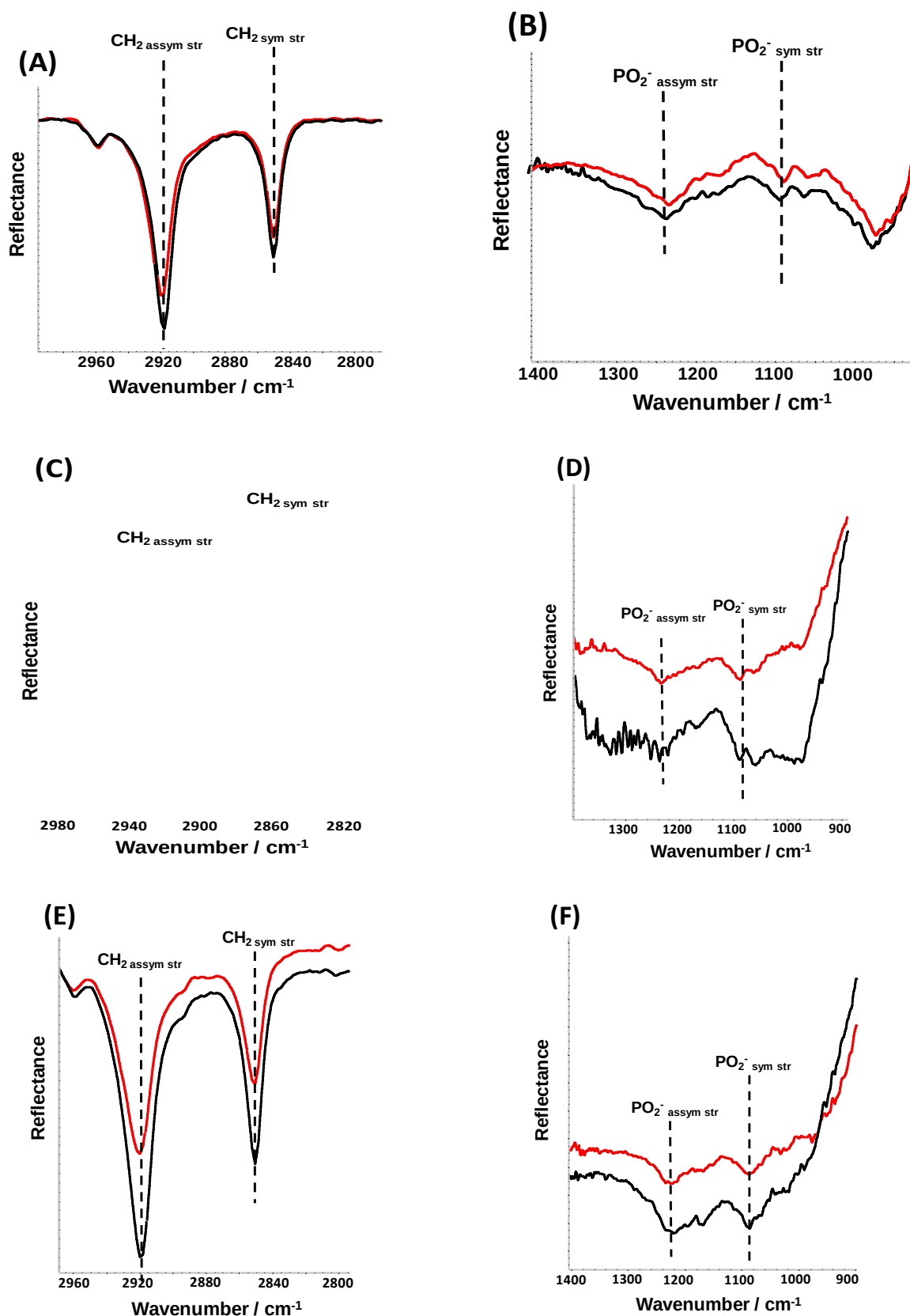
Electronic Supplementary Information for

Calcium-mediated binding of DNA to 1,2-distearoyl-sn-glycero-3-phosphocholine-containing mixed lipid monolayers

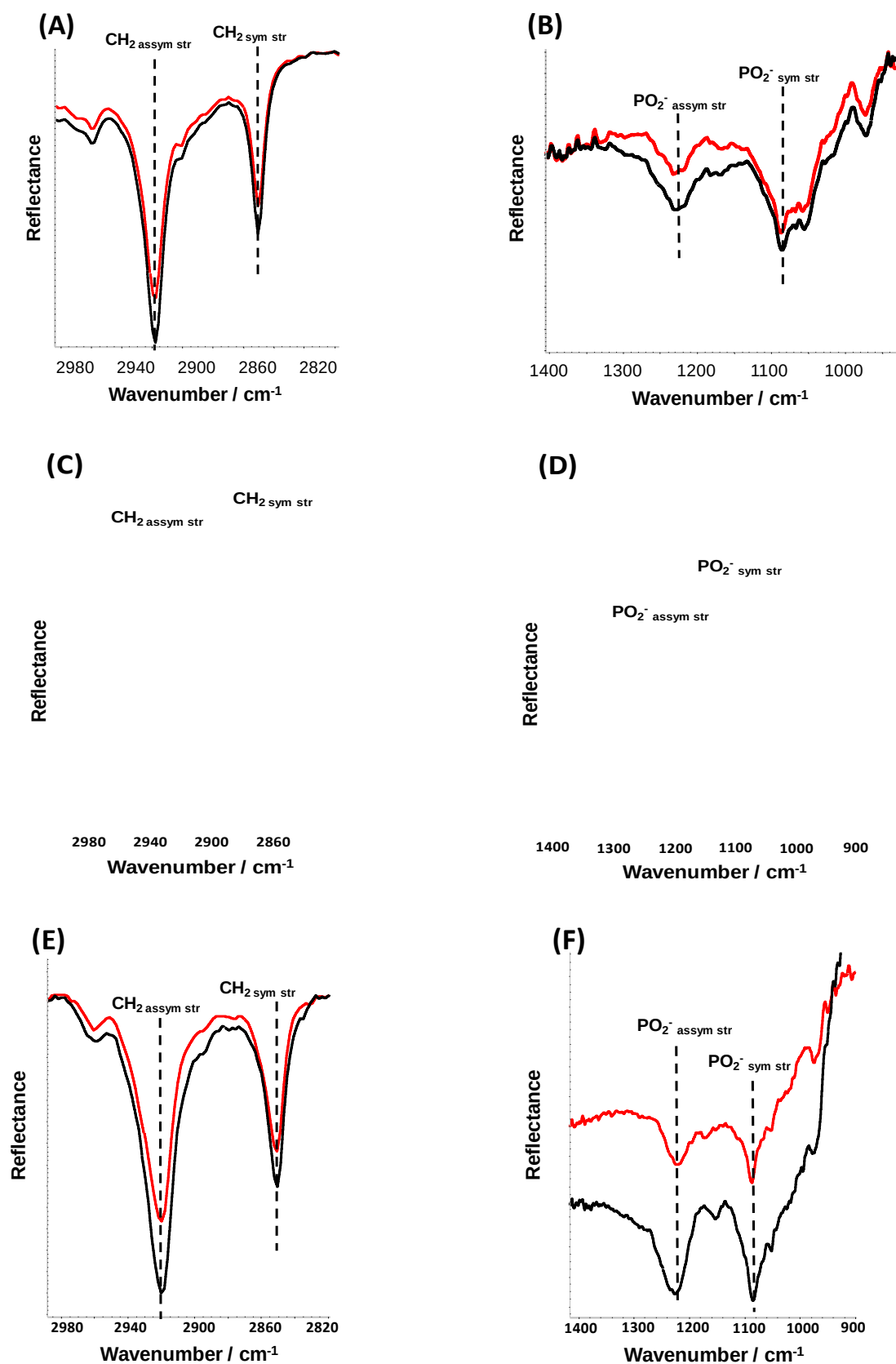
Aleksandra P. Dabkowska, David J. Barlow, Luke A. Clifton, Arwel V. Hughes, John R.P. Webster, Rebecca J. Green, Peter J. Quinn and M. Jayne Lawrence



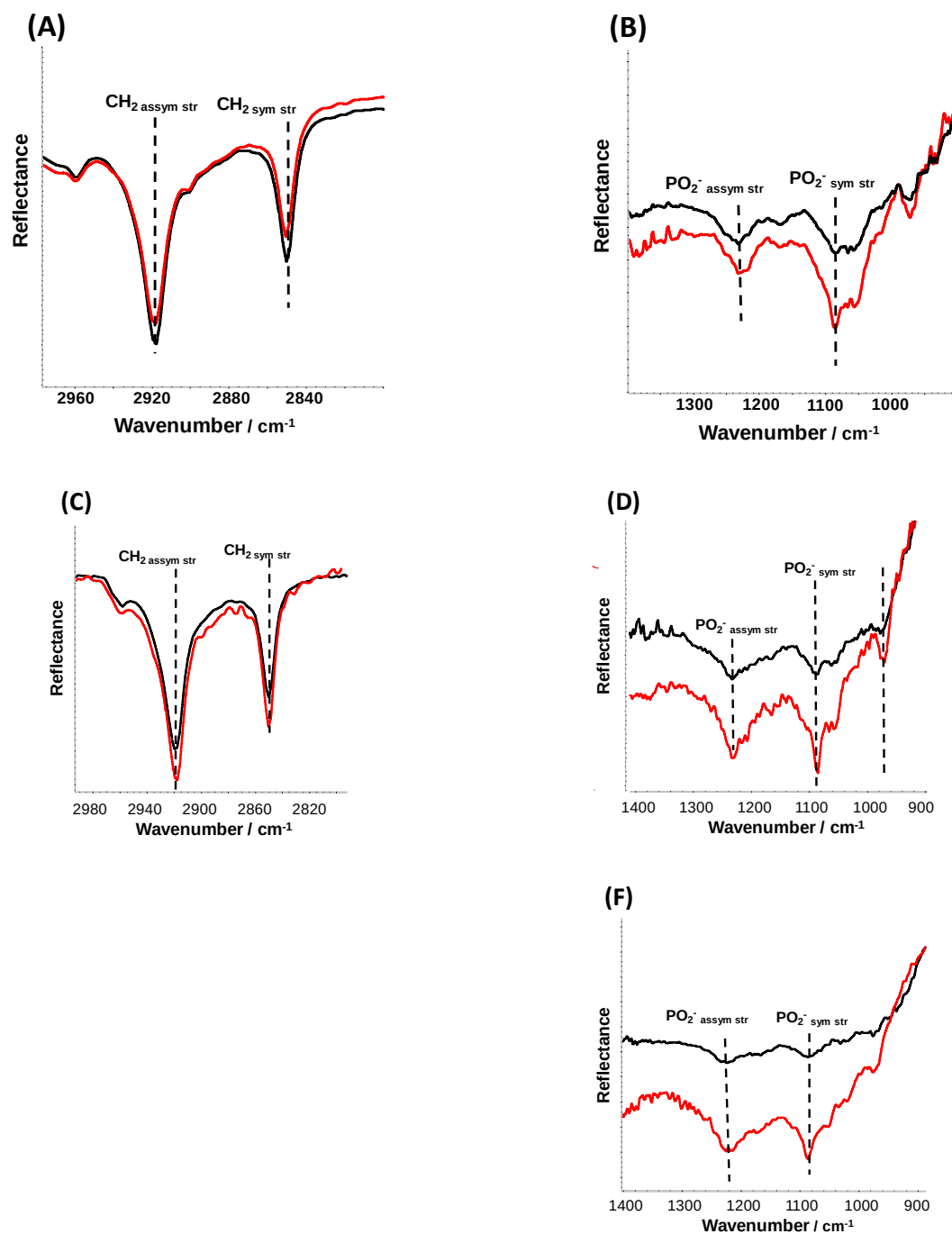
Supplementary Figure 1. Surface tension of ultrapure water (black square), 20 mM CaCl₂ (red circles) and 0.067 mg mL⁻¹ ctDNA in aqueous 20 mM CaCl₂ measured over time on a Kruss tensiometer. The points are a mean of 3 measurements with the error bars representing the standard deviation.



Supplementary Figure 2. Comparison of the external reflection FTIR spectra of lipid monolayers at 10 mN m⁻¹ (red) and 30 mN m⁻¹ (black) on a sub-phase of 20 mM CaCl₂. The spectral regions of the CH₂ stretch vibrations (2820-2960 cm⁻¹) are shown for (a) DSPC, (c) DSPC/cholesterol, and (e) DSPC/DOPE monolayers. The phosphate stretch vibrations (900 to 1300 cm⁻¹) are shown for (b) DSPC, (d) DSPC/cholesterol, and (f) DSPC/DOPE monolayers.



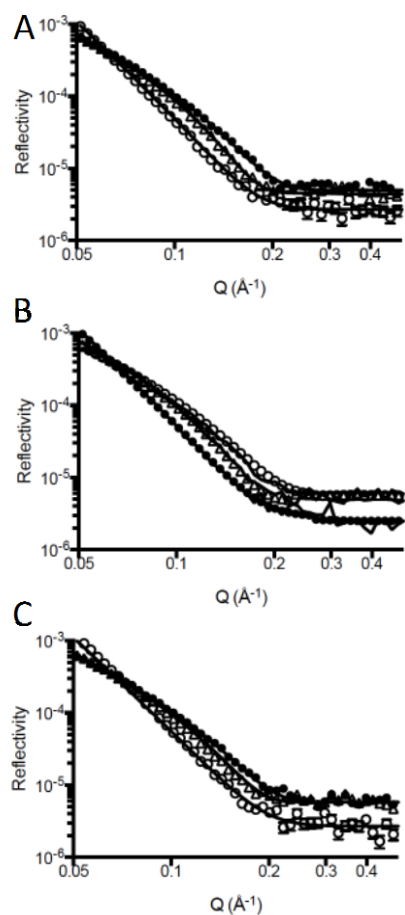
Supplementary Figure 3. Comparison of the external reflection FTIR spectra of lipid monolayers at 10 mN m^{-1} (red) and 30 mN m^{-1} (black) on a sub-phase of 20 mM CaCl_2 with calf thymus DNA ($0.067 \text{ mg mg mL}^{-1}$). The spectral regions of the CH_2 stretch vibrations ($2820\text{--}2960 \text{ cm}^{-1}$) are shown for (a) DSPC, (c) DSPC/cholesterol, and (e) DSPC/DOPE monolayers. The phosphate stretch vibrations (900 to 1300 cm^{-1}) are shown for (b) DSPC, (d) DSPC/cholesterol, and (f) DSPC/DOPE monolayers.



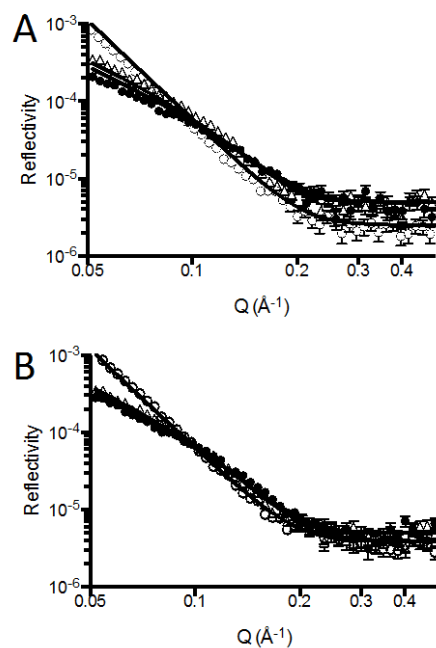
Supplementary Figure 4. Comparison of the external reflection FTIR spectra of lipid monolayers at 295 ± 2 K and at a surface pressure of 10 mN m^{-1} on a subphase of 20 mM CaCl_2 without (black line) and with (red line) calf thymus DNA (0.067 mg mL^{-1}). The spectral regions of the CH₂ stretch vibrations ($2820\text{--}2960 \text{ cm}^{-1}$) are shown for (a) DSPC, (c) DSPC/cholesterol, and (e) DSPC/DOPE monolayers. The phosphate stretch vibrations (900 to 1300 cm^{-1}) are shown for (b) DSPC, (d) DSPC/cholesterol, and (f) DSPC/DOPE monolayers.

Supplementary Table 1. Integrated peak areas of the CH₂ asymmetrical and symmetrical stretches and PO₂⁻ asymmetrical and symmetrical stretching modes.

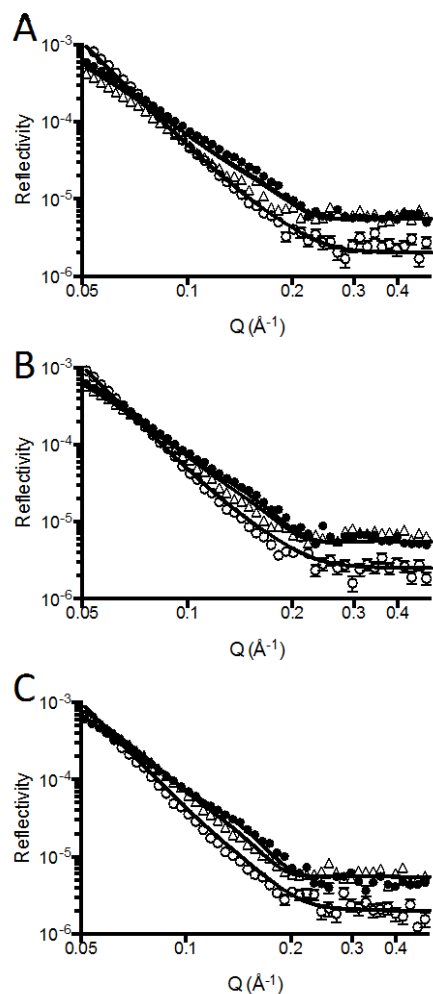
<i>Vibrational Mode</i>					
<i>Sample</i>		CH ₂ assym (2885-2946 cm ⁻¹)	CH ₂ sym (2835-2870 cm ⁻¹)	PO ₂ ⁻ assym (1275-1190 cm ⁻¹)	PO ₂ ⁻ sym (1130-1020 cm ⁻¹)
DSPC	10 mN m ⁻¹	0.0846	0.0342	0.0497	0.1223
DSPC + DNA	10 mN m ⁻¹	0.0744	0.0295	0.0752	0.2138
DSPC	30 mN m ⁻¹	0.0966	0.0353	0.0618	0.1227
DSPC + DNA	30 mN m ⁻¹	0.0948	0.0347	0.0921	0.2243
DSPC/cholesterol	10 mN m ⁻¹	0.0721	0.0262	0.0230	0.0407
DSPC/cholesterol + DNA	10 mN m ⁻¹	0.0831	0.0309	0.0520	0.0955
DSPC/cholesterol	30 mN m ⁻¹	0.0756	0.0299	0.055	0.0517
DSPC/cholesterol + DNA	30 mN m ⁻¹	0.0773	0.0332	0.0817	0.1179
DSPC/DOPE	10 mN m ⁻¹	0.053	0.022	0.0348	0.04
DSPC/DOPE + DNA	10 mN m ⁻¹	0.047	0.02	0.057	0.085
DSPC /DOPE	30 mN m ⁻¹	0.074	0.028	0.036	0.046
DSPC/DOPE + DNA	30 mN m ⁻¹	0.053	0.025	0.074	0.0147



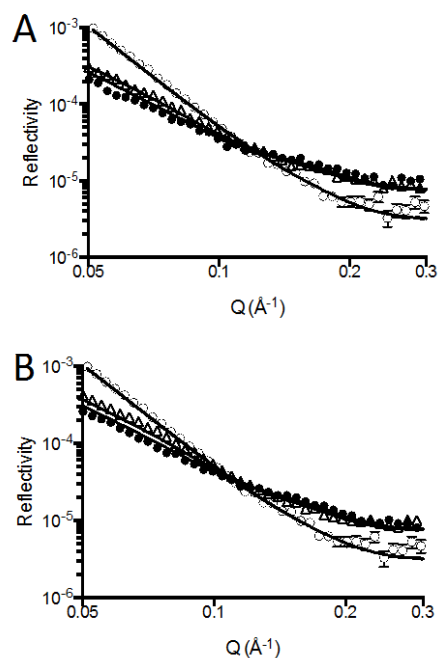
Supplementary Figure 5. SNR profiles for DSPC/cholesterol on a 20 mM CaCl_2 sub-phase at the surface pressures of (A) 10 mN m^{-1} , (B) 20 mN m^{-1} and (C) 40 mN m^{-1} fitted using a two layer model. The contrasts shown are chain-deuterated lipid on acmw (●), fully-deuterated lipid on acmw (△) and protiated lipid on D_2O (○). The simultaneous, three-layer fit is shown as a solid line (—) on each contrast.



Supplementary Figure 6. SNR profiles for DSPC/DOPE on a 20 mM CaCl_2 sub-phase at the surface pressures of (A) 10 mN m^{-1} and (B) 20 mN m^{-1} fitted using a two layer model. The contrasts shown are chain-deuterated lipid on acmw ($\bullet$), fully-deuterated lipid on acmw ($\triangle$) and protiated lipid on D_2O ($\circ$). The simultaneous, three-layer fit is shown as a solid line (—) on each contrast.



Supplementary Figure 7. SNR profiles for DSPC/cholesterol on a 20 mM CaCl_2 sub-phase containing ctDNA (0.067 mg mL^{-1}) at the surface pressures of (A) 10 mN m^{-1} , (B) 20 mN m^{-1} and (C) 40 mN m^{-1} fitted using a two layer model. The contrasts shown are chain-deuterated lipid on acmw ($\bullet$), fully-deuterated lipid on acmw ($\triangle$) and protiated lipid on D_2O ($\circ$). The simultaneous, three-layer fit is shown as a solid line ($—$) on each contrast.



Supplementary Figure 8. SNR profiles for DSPC/DOPE on a 20 mM CaCl_2 sub-phase containing ctDNA (0.067 mg mL^{-1}) at the surface pressures of (A) 10 mN m^{-1} and (B) 20 mN m^{-1} fitted using a two layer model. The contrasts shown are chain-deuterated lipid on acmw (●), fully-deuterated lipid on acmw (△) and protiated lipid on D_2O (○). The simultaneous, three-layer fit is shown as a solid line (—) on each contrast.