## Supporting Information

## The distinct effects of two imidazolium-based ionic liquids, $[C_4mim][OAc]$ and $[C_6mim][OAc]$ , on the phase behaviour of DPPC

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## **Supplementary Figures**



**Fig. S1** SAXS/WAXS intensity profiles of DPPC aqueous dispersions in the presence of [C4mim][OAc] with the lipid:IL ratio of 1:0.5 (A), 1:1 (B) and 1:5 (C) during heating. The increment of temperature is 2 °C.



**Fig. S2** Electron density profiles of DPPC aqueous dispersions in the absence (dashed lines) and presence of IL (solid lines), with lipid:IL molar ratio of 1:2, at 50 °C. The IL is  $[C_4mim][OAc]$  (A) or  $[C_6mim][OAc]$  (B).

## Supplementary Table

**Table S1** The thickness of lipid bilayer,  $d_{P-P}$ , and the thickness of solvent layer,  $d_s$ , of DPPC aqueous dispersions in the absence and presence of [C<sub>4</sub>mim][OAc] or [C<sub>6</sub>mim][OAc] with the lipid:IL ratio of 1:2, at 30 °C.

	$d_{p-p}(nm)$	$d_s(nm)$
DPPC dispersions	$4.18\pm0.02$	$2.19\pm0.02$
DPPC dispersions with [C <sub>4</sub> mim][OAc]	$4.19\pm0.03$	$1.99\pm0.03$
DPPC dispersions with [C <sub>6</sub> mim][OAc]	$3.00\pm0.02$	$2.02\pm0.02$