

## Supporting Information

# Fabrication of Aquaporin-Based Forward Osmosis Membrane through Covalent Bonding of Lipid Bilayer to Microporous Support

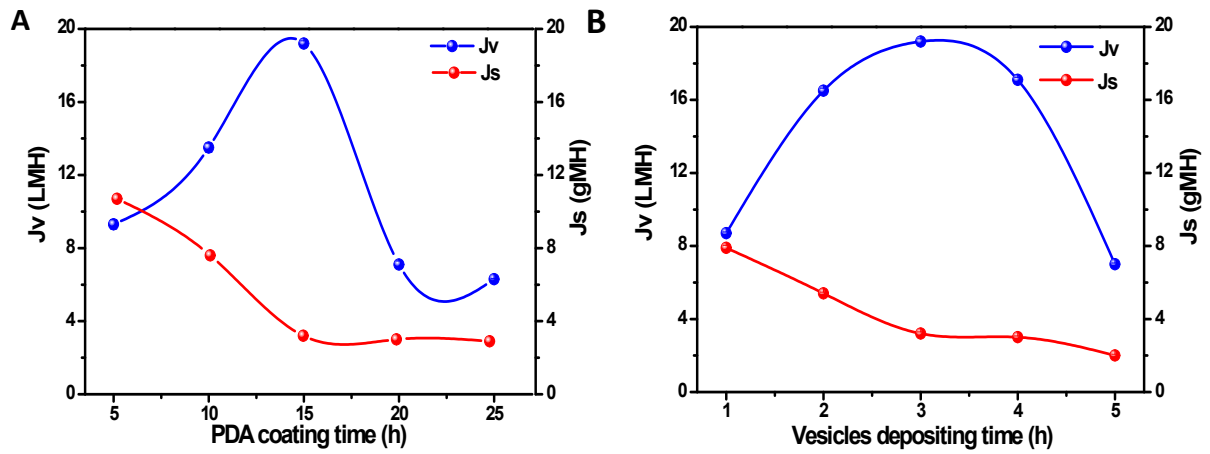
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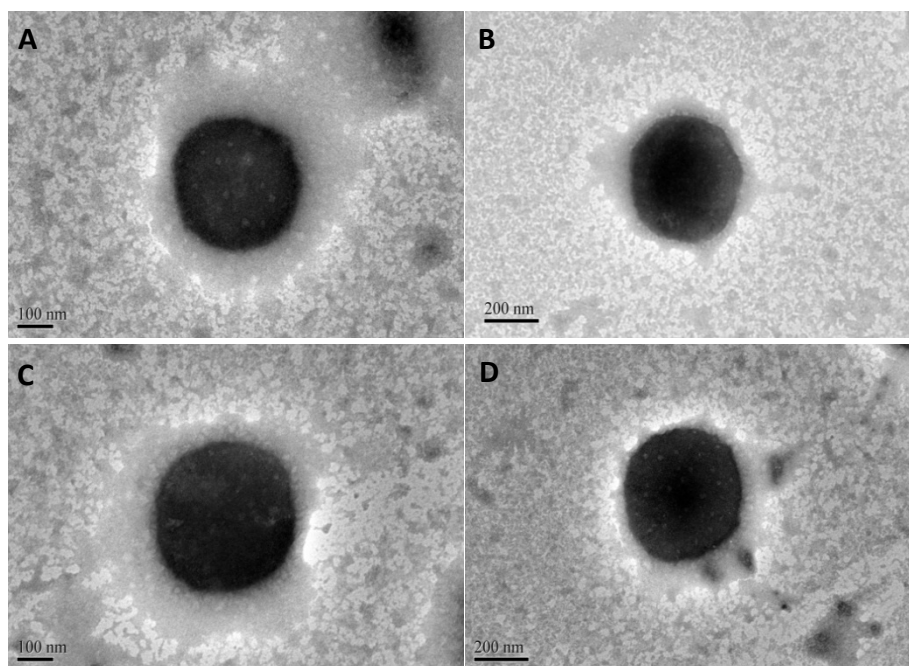
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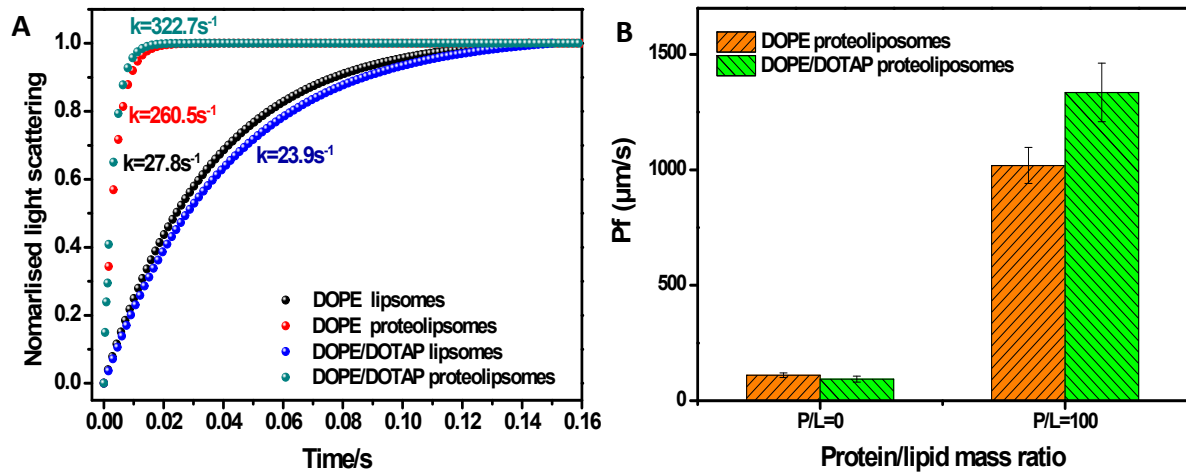
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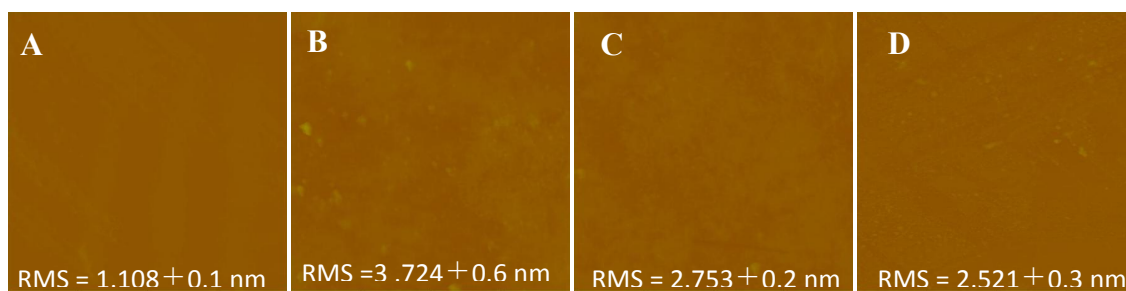
**Fig. S1** Water flux and solute flux of the AqpZ-DOPE SLB, prepared at different conditions. AqpZ-DOPE SLB prepared at different PDA coating time (A), AqpZ-DOPE SLB prepared at different vesicle depositing time to form SLB (B).



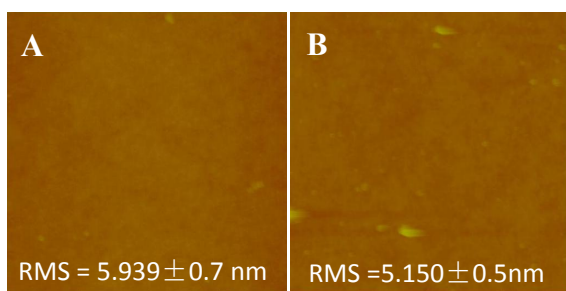
**Fig. S2** Negative-Stained Electron Microscopy of DOPE liposomes (A), DOPE proteoliposomes (B), DOPE/DOTAP liposomes (C) and DOPE/DOTAP proteoliposomes (D).



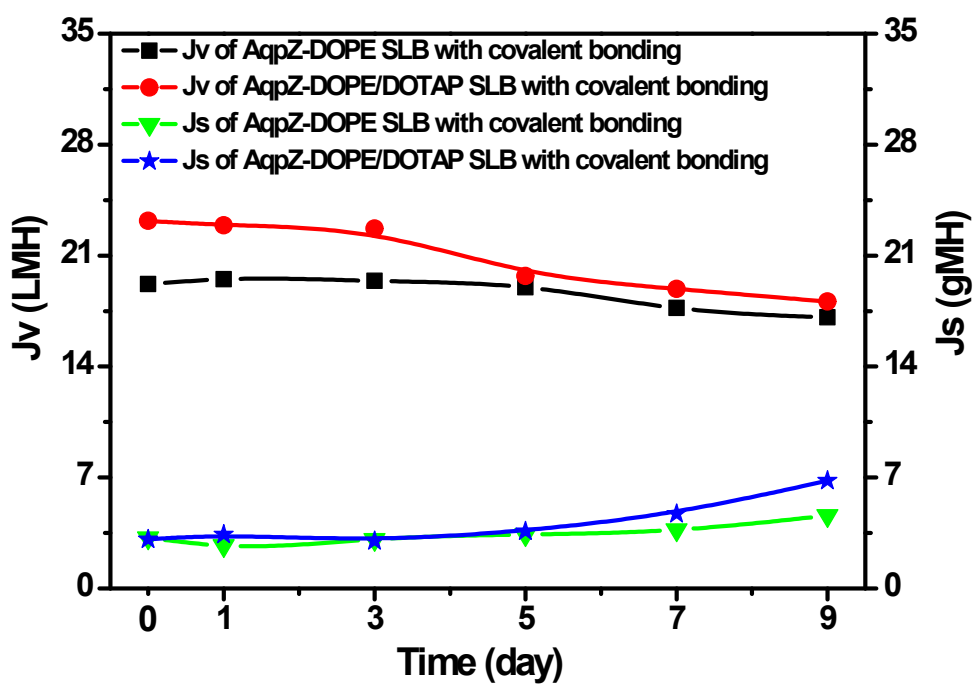
**Fig. S3** Stopped-flow results for the DOPE and DOPE/DOTAP liposomes and proteoliposomes. (A) Normalized light scattering of the stopped-flow kinetics curves and (B) water permeability coefficient.



**Fig. S4** *In situ* AFM images ( $1 \times 1 \mu\text{m}^2$ , z-scale 200nm) of (A) pristine silica, (B) PDA-coated silica, (C) AqpZ-DOPE SLB-coated silica and AqpZ-DOPE/DOTAP SLB-coated silica (D).



**Fig. S5** *In situ* AFM images ( $1 \times 1 \mu\text{m}^2$ , z-scale 200nm) and surface roughness of (A) AqpZ-DOPE SLB' and (B) AqpZ-DOPE/DOTAP SLB'.



**Fig. S6** Changes of water flux and solute flux with increasing the store time in PBS buffer of the AqpZ-incorporated SLB membranes.