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Supporting information

Structure and Dynamics of Lipid Membranes Interacting with Antivirulence Endphosphorylated Polyethylene Glycol Block Copolymers

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Figure S1. SANS profiles of hABAPEG (a) and hPi-ABAPEG (b) in D₂O with different concentrations. (c) SANS profiles (symbols) and the best-fit results (solid lines) with a worm-like chain model of 1 wt% hABAPEG and hPi-ABAPEG in D₂O.

Note: SANS profiles of ABAPEG and Pi-ABAPEG copolymers in D_2O with different concentrations at high q range are proportional to each other, indicating there are no significant differences of local chain conformation before and after end-phosphorylation. This is consistent with the best-fit results with a worm-like chain model.



Figure S2. SLD Determination of hPi-ABAPEG and dPi-ABAPEG copolymers: (a) the square root of SANS intensities of hPi-ABAPEG in the mixtures of H₂O and D₂O with different volume ratios; (b) the square root of SANS intensities of the mixture of hPi-ABAPEG and dPi-ABAPEG with different weight fractions in D₂O. SANS intensities shown here are taken at $q = 0.2 \text{ Å}^{-1}$.

Note: In Figure S2 (a), the SLD of hPi-ABAPEG copolymer is determined as 0.699×10^{-6} Å⁻² at the square root of SANS intensity equal to 0 cm⁻¹ through a linear fit. As the SLDs of hPi-ABAPEG copolymer and D₂O are known, the SLD of dPi-ABAPEG copolymer is determined as 6.27×10^{-6} Å⁻² by the cross point of the linear fit of the square root of SANS intensities at the weight fraction of hPi-ABAPEG equal to 0. 6.27×10^{-6} Å⁻² is corresponding to the SLD of a D2O/H2O mixture with a volume ratio of 98.5:1.5.



Figure S3. (a) NSE spectra of hABAPEG and hPi-ABAPEG in D₂O solutions at 37 °C at different q values. The corresponding q values [Å⁻¹] are indicated. Lines through the points represent the single stretched exponential fits, which describe the data well. (b) q-dependence of the characteristic time, Γ , obtained from the fittings. The segmental dynamics of polymer chains has no significant changes after end-



Figure S4. Normalized X-ray reflectivity, R/R_F , of hDMPC monolayers at the air-water interface and water with a mass fraction of 0.1 % hABAPEG subphases.



Figure S5. DLS measurements show that hDMPC ULV vesicles at 37° C and 20° C and in the presence of 1 %, 3 %, and 5 % hPi-ABAPEG copolymers. For each condition, the radii measured at different times are normalized by the mean ULV radius (61 nm) measured at time = 0 h from the same condition.



Figure S6. Temperature-dependent κ of pure DMPC ULVs and DMPC ULVs in the presence of 1% dPi-ABAPEG copolymers.