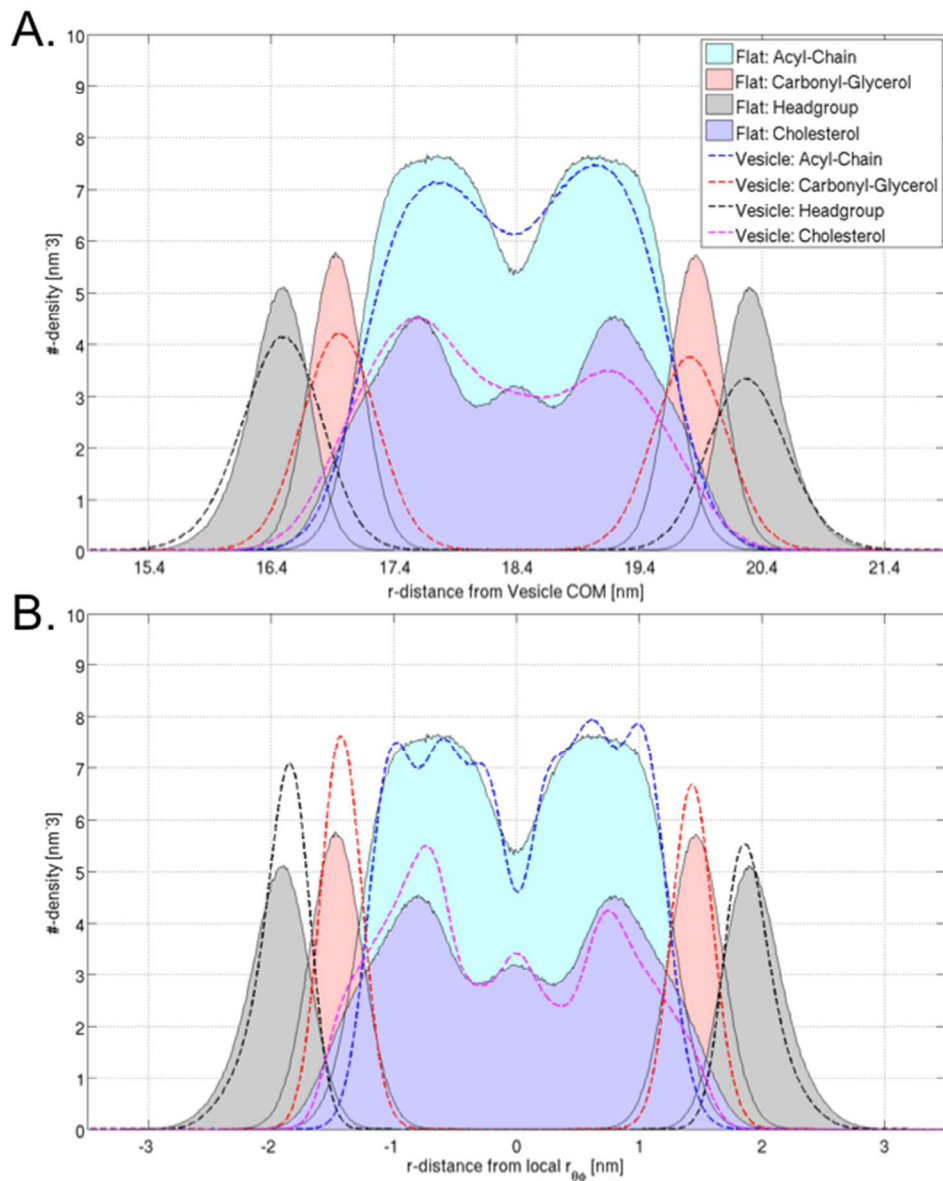


Determining structural and mechanical properties from molecular dynamics simulations of lipid vesicles.

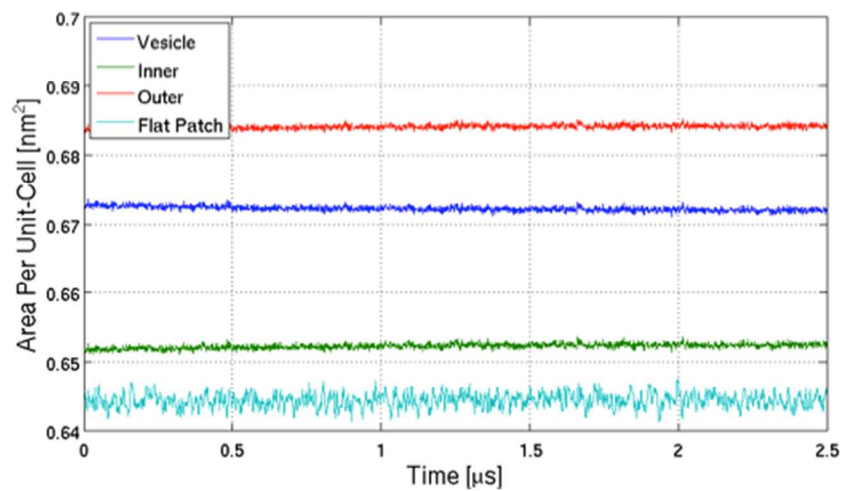
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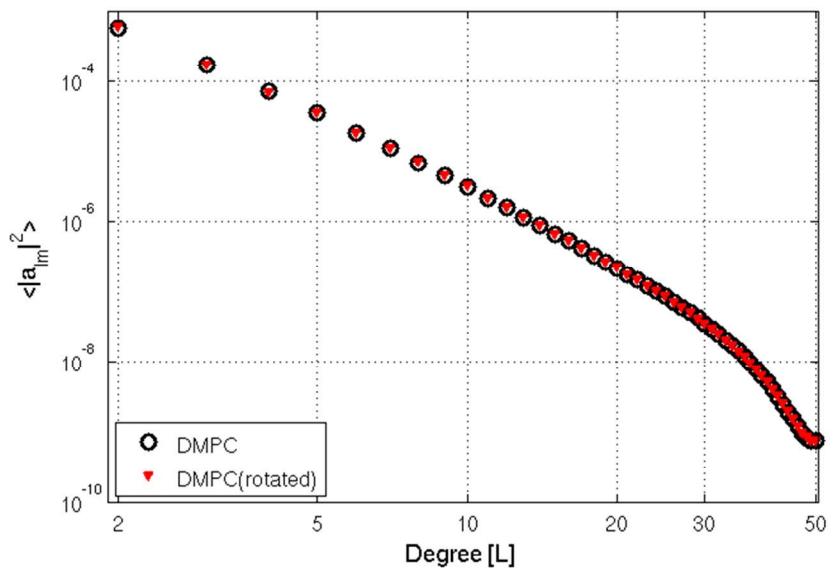
Supporting Info



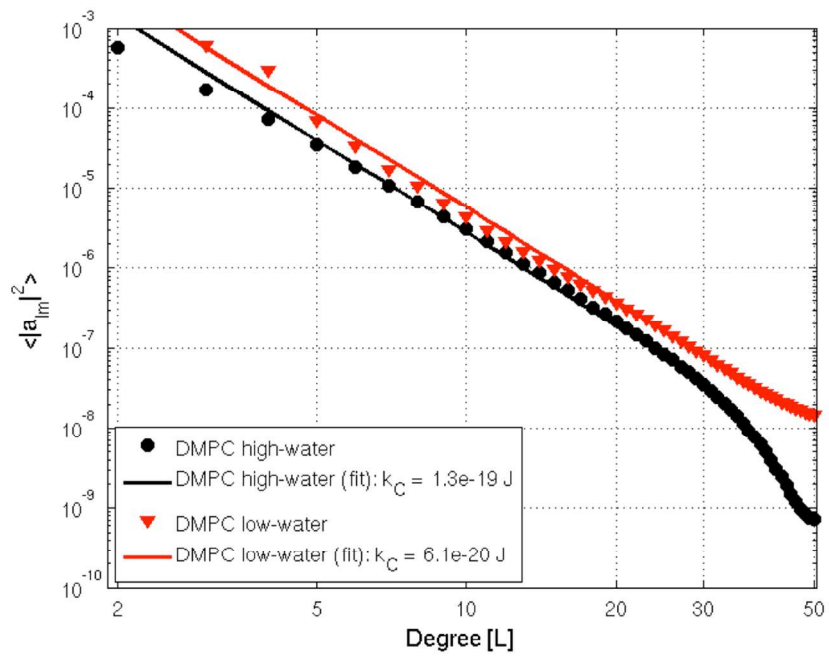
Supplemental Figure 1. A. Comparison of vesicle $\rho_{rbin}(r)$ and flat-patch undulation corrected number density, $\rho_{uc}(z)$, for the DMPC+Cholesterol (30 mol%) system. B. Undulation corrected vesicle, $\rho_{uc}(r)$ and $\rho_{uc}(z)$ for DMPC+Cholesterol (30 mol%). Vesicle profiles presented as dashed-lines, flat-patch profiles as filled-distributions.



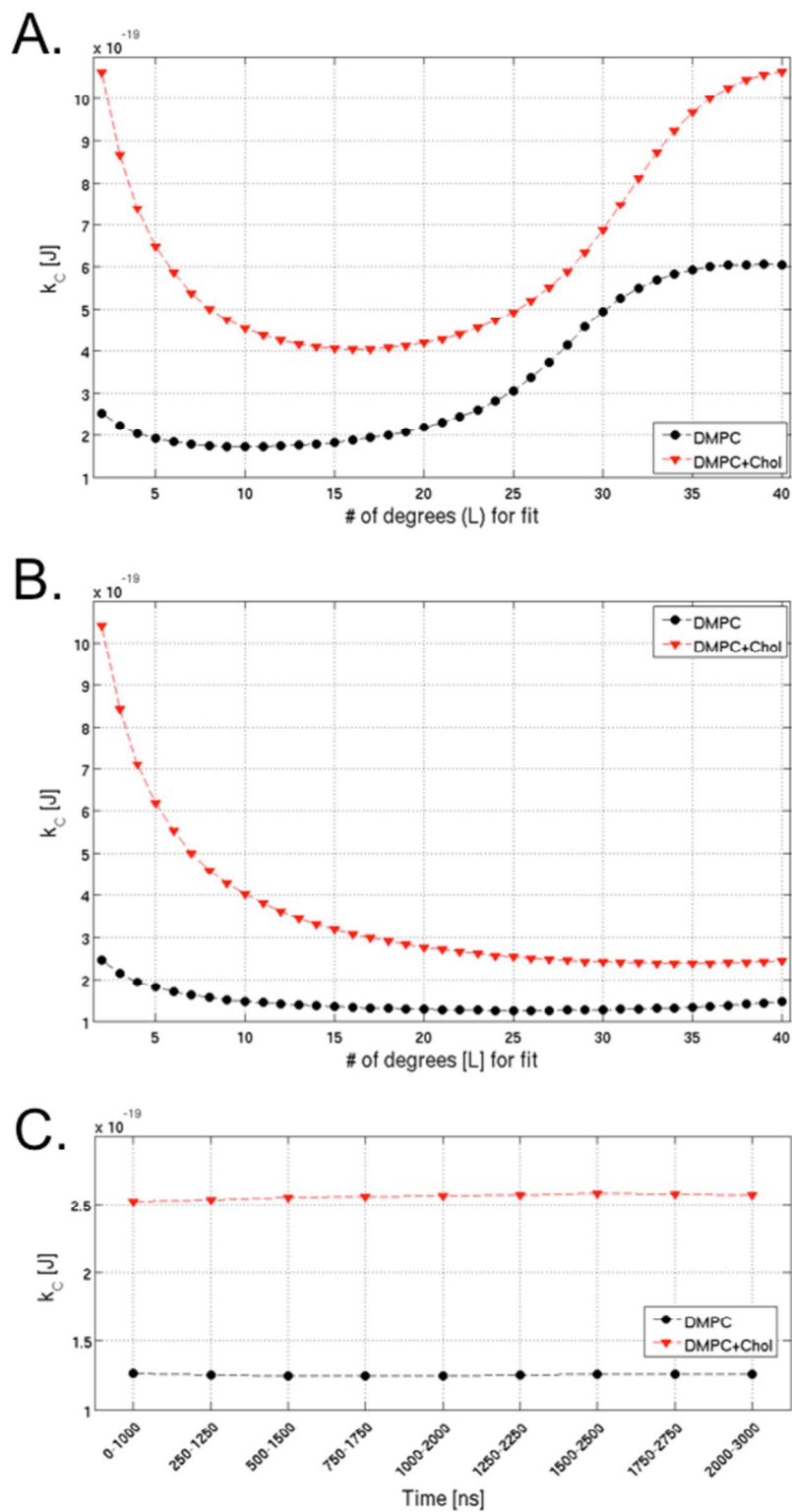
Supplemental Figure 2. Area per lipid trajectory for DMPC+Cholesterol systems. Total vesicle (*blue*), inner monolayer (*green*), outer monolayer (*red*) and flat-patch system (*cyan*).



Supplemental Figure 3. Comparison of SPH fluctuation spectrum of DMPC vesicle and DMPC vesicle rotated 90° . Rotation does not alter the SPHA $k_c = 1.2536 \times 10^{-19}$ J for the original vesicle (*black*) versus $k_c = 1.2506 \times 10^{-19}$ J for the rotated vesicle (*red*).



Supplemental Figure 4. Power spectra for both high-water (*black*) and low-water (*red*) DMPC vesicle systems.



Supplemental Figure 5. Sensitivity of k_C to the number of degrees (L) used for the fit for DMPC (*black*) and DMPC+Cholesterol (*red*) systems with a 1.5nm^{-1} (A) and 2.5nm^{-1} (B) filter cutoffs. C) Time course of k_C over the simulation time for DMPC (*black*) and DMPC+Cholesterol (*red*) systems.