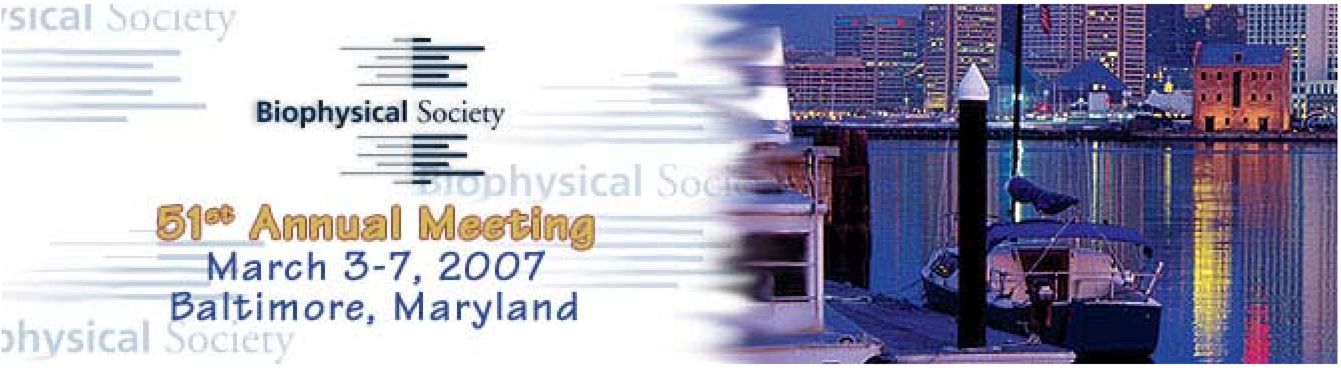

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Session Title: Membrane Structure I

Presentation Number: 2045-Pos

Abstract Title: Curvature Effect on the Structure of Phospholipid Bilayers

Location: Halls A/B/C/D

Topic: 3E Membrane Structure

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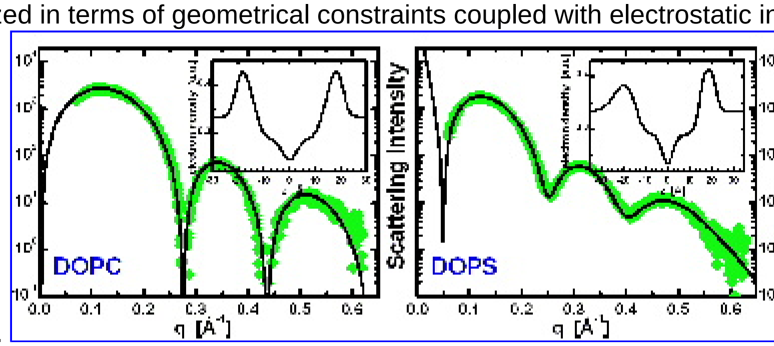
High-resolution small-angle x-ray scattering (SAXS), complemented by small-angle neutron scattering (SANS) and dynamic light scattering (DLS) experiments, was used to study the effect of curvature on the bilayer structure of dioleoyl-phosphatidylcholine (DOPC) and dioleoyl-phosphatidylserine (DOPS) unilamellar vesicles (ULV). Bilayer curvature, as a result of finite vesicle size, was varied as a function of vesicle radius and determined by DLS and SANS measurements. Direct comparison of SANS data over the range of 0.02 $Å^{-1}$<q<0.2 $Å^{-1}$ indicated no change in the overall bilayer thickness as a function of ULV diameter (620 Å to 1840 Å). SANS data were corroborated by high resolution (0.06 $Å^{-1}$<q<0.6 $Å^{-1}$) SAXS data for the same diameter ULV, and data obtained from planar samples of aligned bilayers. Both the inner and outer leaflets of the bilayer were found to be indistinguishable. This observation agrees well with simple geometric models describing the effect of vesicle curvature. On the other hand, 1220 Å DOPS ULV form asymmetric bilayers whose structure can most likely be rationalized in terms of geometrical constraints coupled with electrostatic interactions, rather than bilayer curvature itself.



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