Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

A New Mechanism for Domain Size Selection in Curved Lipid Membranes[1] FANGFU YE, JONATHAN SELINGER, Kent State University — Lipid membranes, composed of saturated lipids, unsaturated phospholipids and cholesterols, play important roles in maintaining cellular activities. It is now well established that lipid membranes under proper conditions separate into saturated-lipid-enriched liquid-ordered (L_o) phase regions and unsaturated-lipid-enriched liquid-disordered (L_d) phase regions, with the L_o phase having a larger bending modulus than the L_d phase. In this project, we study how the bending modulus difference between L_o and L_d phases may affect the phase separation behavior of uniformly curved lipid membranes. We predict that, for membranes of a spherical lipid vesicle, when the line tension between the L_o phase and L_d phase is small the phase separation process is truncated and the underlying curvature leads to formation of stable L_o-phase domains of finite size. We also compare these predictions with experiments on lipid rafts.

[1]Supported by ICAM and NSF Grant DMR-0605889

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Date submitted: 20 Nov 2008 Electronic form version 1.4