Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Diffusive Behavior of Lipid Rafts in Multicomponent Membranes[1] MICHAEL G. LESTER, University of Alabama-Birmingham, MOHAMED LARADJI, University of Memphis, P.B. SUNIL KUMAR, IIT-Madras — The diffusion of nanoscale lipid domains (also known as lipid rafts) in multicomponent membranes in the liquid-liquid coexistence region of the phase diagram is investigated via extensive dissipative particle dynamics simulations. In particular we investigated the effect of membrane diameter and shape (curvature) on the diffusivity of the lipid domains. Our results indicate that the domains exhibit Brownian motion, *i.e.* the center of mass mean square displacement $(\Delta R)^2 = 4Dt$, with the diffusion coefficient decreasing as the domain radius, r, is increased. More specifically, we found that $D \sim 1/r$, *i.e.* the diffusion of the domains is mainly impeded by viscous drag due to solvent surrounding the membrane. Although the data can also be fitted with the logarithmic expression due to Saffman and Delbrück[2] $D \sim \ln(1/r)$ describing diffusion where the membrane viscosity plays an important role, the later fit is found to be poorer than that with $D \sim 1/r$.

[1]This work is supported by grants NSF-DMR 0755447 and NSF-DMR 0812470.
[2]Saffman and Delbrück, Proc. Nat. Acad. Sci. **72**, 3111 (1975)

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Date submitted: 26 Nov 2008 Electronic form version 1.4