Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Lipid Coupling in Asymmetric Supported Lipid Bilayers Revealed by Fluorescence Correlation Spectroscopy YAN YU, Dept. of Materials Science & Engineering, UIUC, LIANGFANG ZHANG, Dept. of Chemical & Biomolecular Engineering, UIUC, STEVE GRANICK, Dept. of Materials Science & Engineering, of Physics, of Chemistry, and of Chemical & Biomolecular Engineering, UIUC — In biological systems, phospholipids asymmetry in two leaflets is a key feature of cell membranes for membrane biogenesis, intracellular fusion and signal transduction. Detailed information of the interactions and dynamics of the asymmetric membranes is paramount for design of applications. Here we use fluorescence correlation spectroscopy (FCS) to measure the coupling between 1, 2-dilauroyl-*sn*-glycero-3-phosphocholine (DLPC) and 1, 2-dipalmitoyl-*sn*-glycero-3-phosphocholine (DPPC) in asymmetric planar-supported bilayers (PSLBs), at temperatures where DLPC is in the fluid phase but DPPC is in the gel phase. Asymmetric PSLBs were prepared by placing dilute fluorescent-labeled 1, 2-dimeristoyl-*sn*-glycero-3-phosphoethanolamine (DMPE) in DLPC leaflet as the probe for measuring lateral diffusion within the host leaflet environment. By constructing asymmetric bilayers where DLPC is alternatively in the top and in the bottom leaflet, we compare lipid coupling between the two leaflets with frictional interaction between the leaflets and the nanometer-thick water layer that separates the bottom leaflet from the solid support.

Yan Yu
Univ of Illinois-Urbana Champaign

Date submitted: 23 Nov 2005 Electronic form version 1.4