Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Lipid mobility in supported lipid bilayers by single molecule tracking MARYAM KOHRAM, University of Akron, Department of Physics, XIAOJUN SHI , ADAM SMITH, University of Akron, Department of Chemistry — Phospholipid bilayers are the main component of cell membranes and their interaction with biomolecules in their immediate environment is critical for cellular functions. These interactions include the binding of polycationic polymers to lipid bilayers which affects many cell membrane events. As an alternative method of studying live cell membranes, we assemble a supported lipid bilayer and investigate its binding with polycationic polymers in vitro by fluorescently labeling the molecules of the supported lipid bilayer and tracking their mobility. In this work, we use single molecule tracking total internal reflection fluorescence microscopy (TIRF) to study phosphatidylinositol phosphate (PIP) lipids with and without an adsorbed polycationic polymer, quaternized polyvinylpyridine (QPVP). Individual molecular trajectories are obtained from the experiment, and a Brownian diffusion model is used to determine diffusion coefficients through mean square displacements. Our results indicate a smaller diffusion coefficient for the supported lipid bilayers in the presence of QPVP in comparison to its absence, revealing that their binding causes a decrease in lateral mobility.

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Date submitted: 14 Nov 2014 Electronic form version 1.4