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Polymers Slaved Diffusion in Phospholipid Bilayers—A Study Using Single-Molecule Fluorescence LIANGFANG ZHANG, Department of Chemical & Biomolecular Engineering, UIUC, STEVE GRANICK, Materials Research Laboratory, UIUC — The translational diffusion of phospholipids DLPC (1,2-dillauroyl-sn-Glycero-3-phosphocholine) in supported fluid bilayers splits into two populations when polyelectrolytes, quaternized poly-4-vinylpyridine (QPVP), adsorb at incomplete surface coverage. Spatially-resolved measurements using fluorescence correlation spectroscopy (FCS) with two-photon excitation show that a slow mode, whose magnitude scales inversely with the degree of polymerization of the adsorbate, coexists with a fast mode characteristic of naked lipid diffusion. Inner and outer leaflets of the bilayer are affected nearly equally. This offers a new mechanism to explain how nano-sized domains with reduced mobility arise in lipid membranes.

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