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Lipid Sorting on Curved Supported Lipid Bilayers Using a Nanoparticle Patterned Substrate PHILIP CHENEY, MICHELLE KNOWLES, Department of Chemistry and Biochemistry, University of Denver — Cellular membranes contain a variety of shapes that likely act as motifs for sorting lipids and proteins. To understand the dynamic sorting that takes place within cells, a continuous, fluid bilayer with regions of membrane curvature was designed and characterized using confocal fluorescence and total internal reflection fluorescence microscopy techniques. A supported lipid bilayer was formed over fluorescently labeled nanoparticles deposited on a glass surface. The lipid composition and membrane shape are separately controlled and the nanoparticle dimensions (d = 40-200 nm) determine the extent of curvature. The bulk membrane is fluid as demonstrated by fluorescence recovery after photobleaching using dye labeled lipids. Dye-labeled streptavidin and cholera toxin subunit B are used to track single molecules and clusters of cap-biotinylated DHPE and ganglioside GM1, respectively. The nanoparticle-patterned substrate is a new tool that allows for quantitative measurement of the dynamic interactions between fluorescent biomolecules and regions of membrane curvature using standard dual-color imaging techniques.

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