

610f Effect of Grafted Peg on Fluctuating Membranes of Spontaneous Vesicles

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The formation of spontaneous surfactant bilayer vesicles is observed in a few chemical systems, most widely in mixtures of cationic and anionic surfactants. While PEG-lipids have been studied as stabilizers of rigid phospholipid vesicles (in applications including drug delivery), the effect of grafted polymers on the micro-mechanical properties of a thermally fluctuating vesicle membrane is not well understood either theoretically or experimentally. Here we use a variety of tethered polymers to tailor the bilayer properties of membranes, including the rigidity and spontaneous curvature, and are able to create extremely monodisperse vesicles. Using dynamic light scattering (DLS) we are able to obtain an average diameter and polydispersity and from cryo-TEM we can obtain membrane rigidity and spontaneous curvature from the exact size distribution of the vesicles. Thus, by direct experimental observation of the spontaneous vesicle size distribution as a function of PEG-lipids, we can better understand the effect of grafted polymers on fluctuating membranes, assisting in the development of new nano-structured materials.