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Light Regulated Anchoring of Biomolecules Via Photoactive Polyelectrolytes JASON BENKOSKI, Chalmers University of Technology, ALDO JESORKA, FREDRIK HOOK — Measuring the biological activity of proteins is critical for the development of advanced pharmaceuticals, which often target specific transmembrane proteins. The development of suitable measurement techniques is limited, however, by the need to host membrane proteins within a lipid matrix. We have therefore developed tethered vesicle assemblies which not only allow for undisturbed hosting of membrane proteins, but are also compatible with a battery of surface sensitive measurement techniques. The assemblies are comprised of three parts: a supported phospholipid bilayer (SPB), DNA oligomers tagged with a lipophilic polymer that becomes hydrophilic when exposed to UV light, and small unilamellar vesicles (SUVs). These three components provide a nonfouling surface, a mobile tether which connects the SPB to the SUVs, and a protein hosting matrix, respectively. We demonstrate that individual binding events can be monitored through the observation of vesicle agglomeration and reduced diffusivity as monitored by fluorescence microscopy. We further demonstrate that such assemblies can be released from the surface by exposing the photoresponsive tethers to UV light.

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