

Preparation of Giant Unilamellar Vesicles and Solid Supported Bilayer from Large Unilamellar Vesicles: Model Biological Membranes

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Abstract

Giant Unilamellar Vesicles (GUV) and supported planar membranes are excellent model biological systems for studying the structure and functions of membranes. We have prepared GUV from Large Unilamellar Vesicles (LUV) using electroformation and Supported planar Lipid Bilayer (SLB) by vesicle fusion method. LUV was prepared using an extrusion method and was characterized using Dynamic Light Scattering (DLS) and zeta potential measurements. The techniques for obtaining GUV as well as SLB from LUV have been demonstrated. We have directly observed the formation of GUV under phase contrast microscopy. This study will provide some insights into the physico-chemical properties of both nano and micron size vesicles. We believe that this method could be extremely useful for reconstituting various bio-molecules in GUV. We have presented one example where an antimicrobial peptide NK-2 was reconstituted in GUV prepared from LUV. SLB formation was monitored and characterized using Atomic Force Microscopy (AFM).

Keywords: AFM, Dynamic Light Scattering, Model Membranes, Optical Microscopy, Solid Supported Bilayer, Vesicles