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Synthesis of Giant Unilamellar Vesicles (GUV) from Liposomes Prepared by the Rapid Solvent Exchange (RSE) Method EDA BAYKAL-CAGLAR, Texas Tech — Lipid bilayers, which is an important constituent of cell membranes, has been extensively studied by biophysicists. Cell membranes perform many vital cell functions such as signal transduction and transportation of materials needed for the functioning of the cell organelles. Understanding the organization and dynamics of lipid bilayers is important for understanding the processes taking place in cell membranes. Giant Unilamellar Vesicles (GUVs) are cell-sized model systems that allow direct visualization of membrane-related phenomena using fluorescence microscopy. In this study, we investigated the synthesis of GUVs from much smaller liposomes (less than 0.5 microns) produced by the Rapid Solvent Exchange (RSE) method in aqueous solutions of high and low ionic strength. The GUVs synthesized using RSE liposomes are more uniform in lipid composition than that synthesized by other methods. We made a number of modifications to the original electroformation method, and we are able to prepare GUVs from RSE liposomes both in high ionic strength and low ionic strength buffers. Using our optimized procedure, we are also able to produce high quality multi-component GUVs to study the dynamics of lipid domains.

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