

Rapid Synthesis of Giant Unilamellar Vesicles for Use in Studying the Role of Cellular Membrane Lipids

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Abstract

The cellular membrane has many different functions, including controlled transport of substances in and out of the cell. By studying different lipid components of the membrane, scientists can examine each lipid's role in membrane structure and transport. Due to the complexity of working with cells *in vivo*, scientists are frequently challenged with uncovering fundamental roles of specific lipids in membrane function. For this reason, there is a collaborative interest in constructing artificial cells that mimic the behaviors of cell membranes. Giant Unilamellar Vesicles (GUVs) are a type of artificial cell that lend themselves to intrinsic study of membrane composition and function.

A quick review of the literature indicates GUV formation can be both tedious and expensive. The focus of our studies is to develop reproducible procedures to synthesize GUVs in a short amount of time with low costs. Once reliable methods for forming and evaluating GUVs are established, additional study of extracellular-membrane interactions can be pursued. This work has real world application as GUVs have strong potential as pharmaceutical delivery devices.