

Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

Cubic Phase Formation in Phospholipid and PEG-Lipid Mixtures

KIMBERLY MURLEY, Denison University, BETH CUNNINGHAM, Bucknell University, DAVID WOLFE, Lycoming College, PATRICK WILLIAMS, King's College London — Lipid systems modeling cell membranes are capable of self-assembling into various liquid crystal mesophases with varying geometry and dimensions. We have suggested that it is possible to engineer the lipid systems through the incorporation of covalently attached polymer lipids to produce unique effects. The results of this engineering process include both the stabilization of lipid phases that normally exist over very limited temperature ranges and the induction of novel phases that are not normally present in the parent lipid. In this study, we used x-ray diffraction and NMR to investigate the phase behavior of the DOPE:PEG:MO and MO:PEG:D₂O systems with varying molar ratios and PEG sizes. The phase diagram which we have generated indicates the conditions necessary to induce specific phase structures and sizes into three-dimensional cubic lipid systems. This information may be useful to create nanostructures which will be valuable in applications such as protein crystallization and protein biochip development.

David Wolfe
Lycoming College

Date submitted: 30 Nov 2004

Electronic form version 1.4