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Cubic Phase Formation in Peptide/Lipid Systems[1] BRANDON SCUFFINS, BETH CUNNINGHAM, Bucknell University, DAVID WOLFE, Lycoming College — Previous studies have shown that the phenomena of spontaneous membrane self-assembly can be used to incorporate membrane peptides into lipid bilayers. Once a peptide is incorporated in these peptide/lipid systems they may then be crystallized through the process of *in meso* crystallization. In this study, we used x-ray diffraction and ^{31}P NMR to show that a system of dioloeoylphosphatidylethanolamine (DOPE), monoolein (MO), and DOPE with polyethylene glycol covalently attached to the headgroup (PEG-lipid) can create a system with a higher concentration of peptide incorporated into the cubic phase then previously reported. We have observed that DOPE:MO:PEG-lipid at a molar ratio of 97.5:100:2.5 naturally forms the Im3m cubic phase at room temperature. Furthermore, we found that the DOPE:MO:PEG-lipid system can incorporate a concentration of up to 25 mole % peptide at room temperature. Preliminary results indicate that the lipid/peptide system requires a stable cubic phase for peptide crystallization to occur.

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