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Possible Domain Formation In PE/PC Bilayers Containing High Cholesterol MATTHEW HEIN, FAZLE HUSSAIN, JUYANG HUANG, Texas Tech University — Cholesterol is a significant component of animal cell membranes, and its presence has the effects of not only adding rigidity to the lipid bilayer, but also leading to the formation of lipid domains. Two other lipids of interest are phosphatidylethanolamine (PE), which constitutes about 45 percent of the phospholipids found in human nervous tissues, and phosphatidylcholine (PC), which is found in every cell of the human body. The maximum solubility of cholesterol is the highest mole fraction of cholesterol that the lipid bilayer can retain, at which point cholesterol begins to precipitate out to form cholesterol monohydrate crystals. We have measured the maximum solubility of cholesterol in mixtures of 16:0-18:1PE and 16:0-18:1PC using a new light scattering technique, which utilizes the anisotropic nature of light scattering by cholesterol crystals. This new method is highly accurate and reproducible. Our results show that the maximum solubility of cholesterol increases linearly as a function of the molar ratio POPC/(POPE+POPC), which suggests possible domain formation in mixtures of PE and PC containing maximum amount of cholesterol.

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