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The Lipid domain Phase diagram in a Dipalmitoyl-PC/Docosahaexnoic Acid-PE/Cholesterol System[1] CHAI LOR, LINDA HIRST[2], University of California, Merced — Lipid domains in bilayer membrane and polyunsaturated fatty acids (PUFAs) are thought to play an important role in cellular activities. In particular, lipids containing docosahaexnoic acid are an interesting class of PUFAs due to their health benefits. In this project, we perform oxidation measurements of DHA-PE to determine the rate of oxidation in combination with antioxidants. A ternary diagram of DPPC/DHA-PE/cholesterol is mapped out to identify phase separation phenomena using atomic force microscope (AFM). Fluorescence microscopy is also used to image lipid domains in a flat bilayer with fluorescent labels. As expected, we observe the phase, shape, and size of lipid domains changes with varying composition. Moreover, we find that the roughness of the domains changes possibly due to overpacking of cholesterol in domains. This model study provides further understanding of the role of cholesterol in the bilayer membrane leading towards a better understanding of cell membranes.

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