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Logarithmic Domain Growth in Ternary Mixture Lipid Multilayer Systems with Cholesterol[1] YICONG MA, SAJAL GHOSH, DAVID DILENA, LAURA CONNELLY, NIRAV PATEL, FERNANDO TERAN ARCE, RATNESH LAL, SUNIL SINHA, University of California, San Diego — Cholesterol, one essential constituent of the cell membrane, is shown to perform an important function in maintaining the membrane integrity and fluidity. However, the role of cholesterol in mixed membrane phase behavior is still not completely understood. In our study of model membrane multilayer systems consisting of 1:1 DPPC/DOPC with 0 to 30% Cholesterol, we have studied the kinetics of domain growth as a function of time. X-ray diffraction measurements reveal two different time scales of domain growth: fast growth at small time scale of minutes, and slow growth at large time scale which exhibits a logarithmic growth law. This logarithmic growth law may indicate that the barriers to domain growth increase linearly with the domain size [1,2]. Our detailed analysis of domain lipid structure from electron density profiles with different cholesterol concentrations, and comparison of the growth law time constants should shed new light on the effects of cholesterol on membrane domains. [1] J.D Shore, M.Holzer, and J.P.Sethna, Phys. Rev. B 46, 11376 (1992). [2] Z. W. Lai, G. F. Mazenko, and O. T. Valls, Phys. Rev. B 37,9481 (1988).

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