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Differential effects of sterols on phospholipid acyl chain packing in binary and ternary mixes DRAKE MITCHELL, Portland State University, MATTHEW DAVIS, Department of Physics, Portland State University — We examined the effects of the cholesterol, ergosterol and cholestane on phospholipid acyl chain packing in 16:0,18:1 PC and ternary mixtures where di-18:0 PC/di-18:1 PC/cholesterol forms coexisting liquid ordered (Lo) and liquid disordered (Ld) phases. Ensemble acyl chain order was assessed via time-resolved fluorescence measurements of DPH. Analysis in terms of the P2-P4 Model enabled separation of probe motion and orientational order. In 16:0,18:1 PC ergosterol and cholesterol increased probe order to a similar extent. Cholestane had essentially no effect on probe order and a small effect on probe motion. Effects of the 3 sterols were also examined in a ternary mix of di-18:1 PC/di-18:0 PC/sterol selected from the middle of the Lo/Ld coexistence region of the di:18:1/di-18:0/chol phase diagram at 23C. In the ternary mix the effects of cholesterol and ergosterol on ensemble acyl chain order were distinguishable, with ergosterol having a smaller effect. In this mix cholestane had a pronounced ordering effect and reduced the rate of probe motion. The results suggest that sterol structure plays a more significant role in altering acyl chain interactions in mixtures with the potential to form coexisting Lo/Ld domains than in single component bilayers.

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