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Phase Separation in Asymmetric Lipid Bilayers: Cubic and Quartic Interaction Terms FANINDRA BHATTA, DAVID ALLENDER, Kent State University — Previous work has considered asymmetric bilayers in which each layer contains a mixture of cholesterol and lipids, but the two layers have different lipids and different concentrations of cholesterol. In particular, one layer has concentrations such that phase separation into cholesterol rich and cholesterol poor phases is expected, but the second layer, if unaffected by the first layer, would not phase separate. Using only the leading terms of interaction between cholesterol concentration and the straightening of the hydrocarbon chains in the lipids in a given layer, plus a coupling of the two layers via their chain order, it was found that phase separation in one layer causes phase separation in the second. We have examined the effect of higher order terms in the chain ordering on phase separation behavior of the bilayer. We find a shift of the critical temperatures and cholesterol concentrations for the phase separation, but qualitatively the same behavior as in the simpler model.

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