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The Impact of Cholesterol on Lateral Organization in a Three-Species Non-Equilibrium Model of a Biomembrane ANDREW P. PARADIS, SUSAN R. MCKAY, SAMUEL T. HESS, Department of Physics and Astronomy, University of Maine, Orono, Maine 04469-5709 — Experimentally, cholesterol strongly influences many biological functions in cells. This study examines the mechanisms by which cholesterol affects membrane organization using a simple non-equilibrium model with exo- and endocytosis events. Three species, representing cholesterol, saturated and unsaturated lipids, move and interact on a two dimensional triangular lattice, simulated using a Metropolis algorithm. Interaction energies among the three species are adjustable, as are the rate and size of simulated endo- and exocytosis events. These events keep the system substantially out of equilibrium and yield a striped pattern comparable to those seen experimentally. [1]

[1] Baumgart T, Hess ST, and Webb WW. Nature. 2003 Oct 23;425(6960):821-4.

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