How do cells control membrane raft size?

**Abstract** The spatial organization of lipids and proteins in biological membranes has a functional role in the life of a cell. Diverse evidence supports participation of lipid microdomains (rafts) in membrane processes including protein sorting and signaling. Raft functionality is thought to involve the reversible coalescence of small and transient domains into larger stable structures that act as platforms for organizing protein machinery. Despite intense interest, the fundamental mechanisms by which cells control raft size and lifetime remain elusive. I will describe how small-angle neutron scattering (SANS) can be used to detect and characterize membrane rafts in simplified lipid-only models that mimic the composition of plasma membrane. Importantly, SANS does not require the use of extrinsic probes that can perturb the bilayer's phase behavior. SANS reveals that domain size is strongly affected by the degree of acyl chain unsaturation of low-melting temperature lipids, and tightly correlated to the thickness mismatch between coexisting liquid phases. Taken together, these results suggest a dominant role for line tension in controlling raft size.