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Shaping fluid lipid membranes with proteins and cytoskeletal filaments

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zoom

- Cell membranes are highly deformable and have to be strongly curved, for instance during trafficking when small buds form and eventually detach from cell membranes, or during cell migration upon the formation of actin-sustained cellular protrusions (filopodia). These membrane-shaping processes always require the interaction with proteins (for instance, BAR domain proteins with an intrinsically-curved shape) and in some cases with the actin cytoskeleton. In vitro membrane systems with controlled curvature combined to theoretical models have been instrumental for understanding how proteins and cytoskeleton shape cellular membranes, and conversely how membrane curvature is a cue for the local enrichment of peripheral or integral proteins with non-symmetric shape. Similarly, they help understanding how non-curvature sensing proteins are recruited on curved membranes. In this talk, I will discuss examples of proteins with intrinsically-curved shapes that are enriched in curved membranes, how they assist the recruitment of non-curvature sensing proteins, or induce filopodia generation, due to their intrinsic coupling to membrane curvature.

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