

Dynamics of Biomembranes in nano- to micro-meter scales

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Bilayer membranes exhibit many interesting phenomena such as shape deformation induced by phase separation or chemical reaction, membrane fusion, and membrane fission. Since the length scale of these phenomena widely varies from nano- to micro-meter scale, different types of membrane models are required to simulate each length scale [1]. Thus, we have developed two types of membrane models: solvent-free coarse-grained molecular model [2,3] and meshles membrane models [4]. In these models, we can widely vary membrane properties such as the fluidity, bending rigidity, and the line tension of membrane edges. We will present self-assembly into vesicles, membrane fusion, and vesicle rupture using these simulation models.

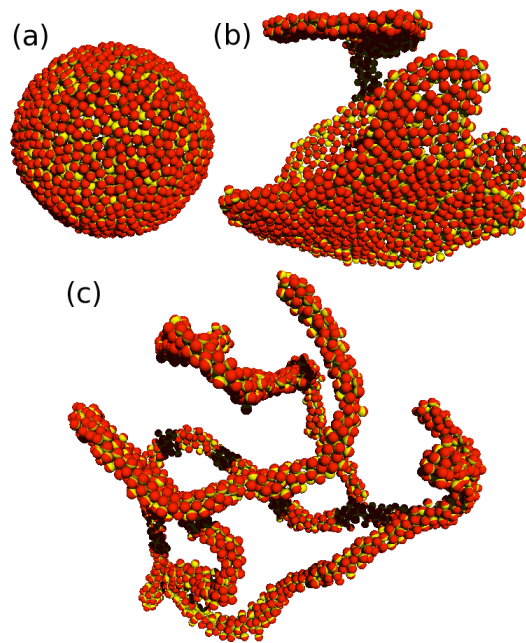


Fig. 1: Sequential snapshots of vesicle rupture to worm-like micelle.

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