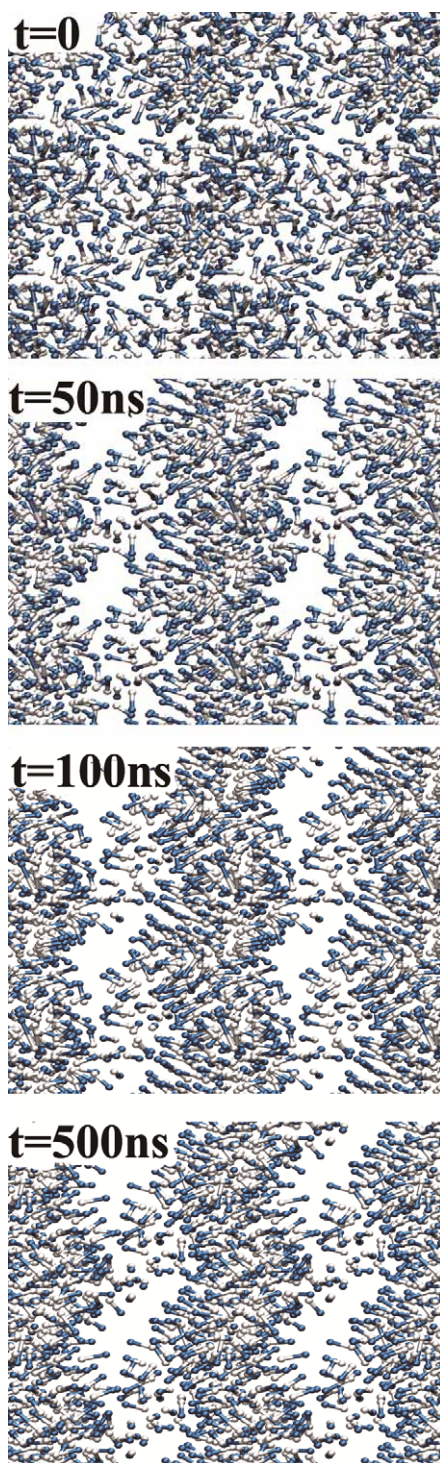


## A dual-scale model for the caveolin-mediated vesiculation

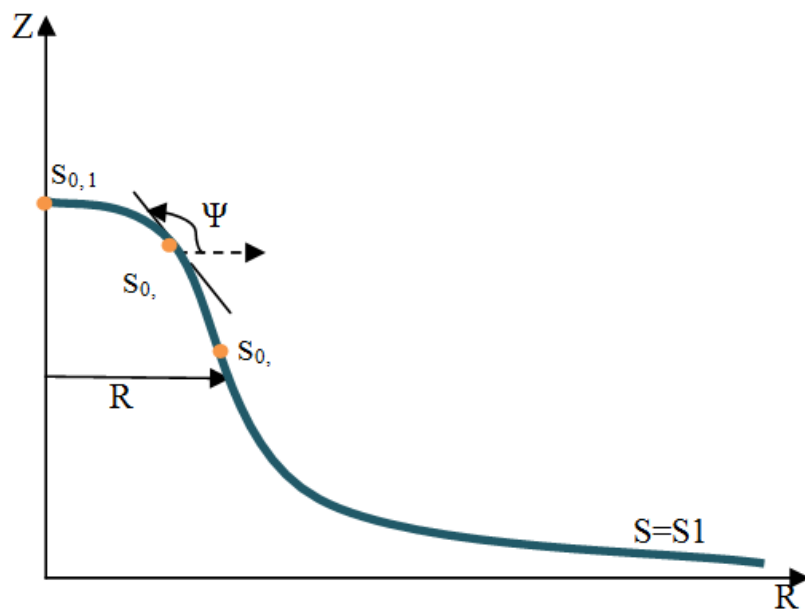
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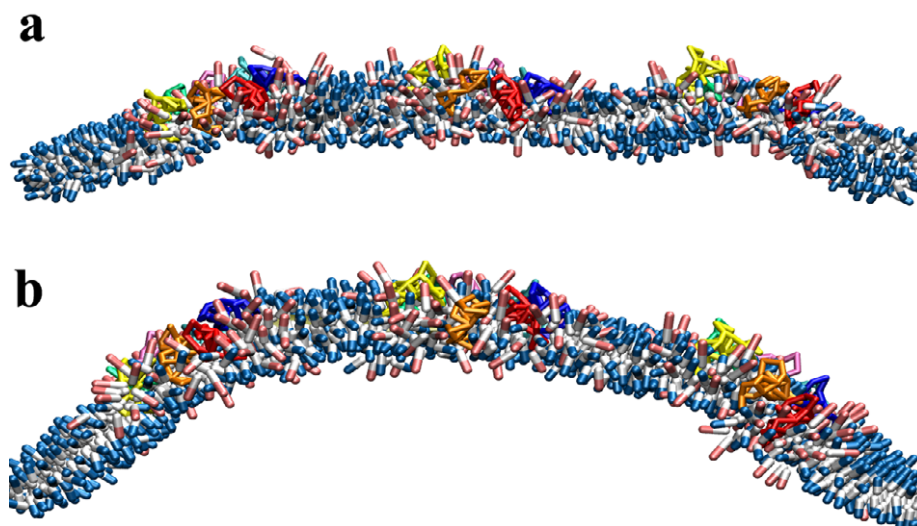
### Electronic supplementary information (ESI)



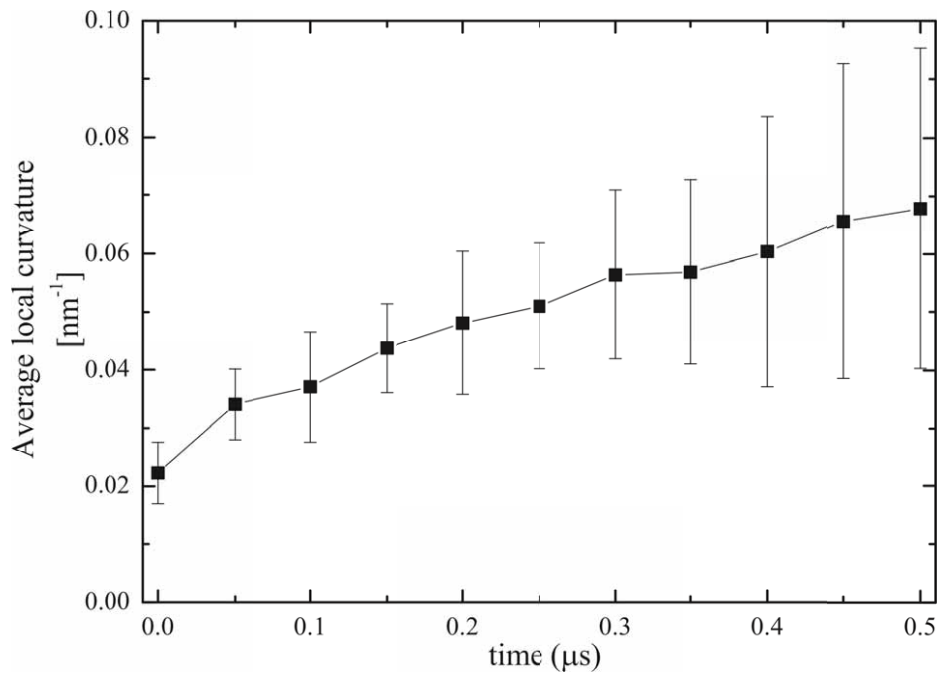
**Figure S1** Self-assemble dynamics of the two-bead lipid membrane.



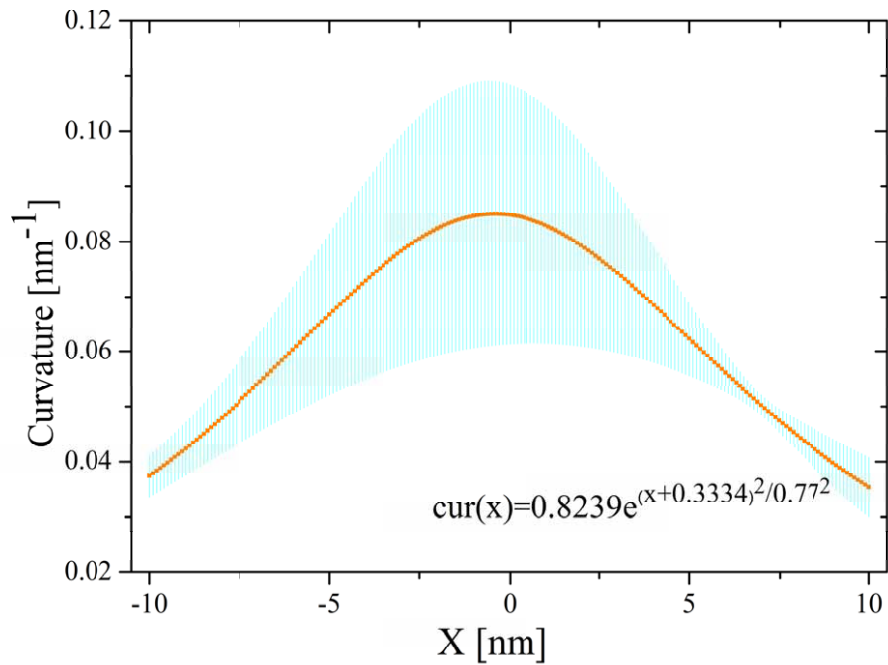
**Figure S2** A schematic of the one-dimensional membrane profile (The full membrane shape is given by rotating the curve in the z-axis by  $2\pi$ ).



**Figure S3** A simulation of membrane morphology with three aligned caveolin oligomers. (a) A typical morphology of three independently development of local curvature. (b) The development of local bending into a curve.



**Figure S4** Average local curvature induced by three aligned caveolin oligomers on the membrane.



**Figure S5** Fitting for the curvature distribution of all the simulation profiles (the cyan lines) along the membrane in the configuration of SET1. The solid line is the Gaussian fitting curve.