Supplementary Material

SUPPLEMENTARY TEXT

The total energy of a vesicle with two adsorbed disks is composed of the vesicle bending energy and the disks adhesion energy. The bending and adhesion energies of the vesicle with two disks of different relative sizes are shown in Figure S1 for disk sizes $R_d/R_v = (0.16, 0.24)$ and in Figure S2 for disk sizes $R_d/R_v = (0.32, 0.4, 0.48)$. In the strong adhesion limit the adhesion area, and thus the adhesion energy E_{ad}, is supposed to remain almost constant as a function of the disk distance. The adhesion area is the sum of the individual areas of adhered triangles of the triangulated vesicle. For stretched vesicles with large disk distances, the border triangles along the disk perimeter are stretched giving rise to an increase in the adhesion area versus the disk distance, in particular for larger disks. The resulting slight decrease, we observe here in the adhesion energy $E_{ad} = -UA_{ad}$, is negligible compared to the bending energy and does not make meaningful change in the character of pairwise interactions.

SUPPLEMENTARY FIGURES

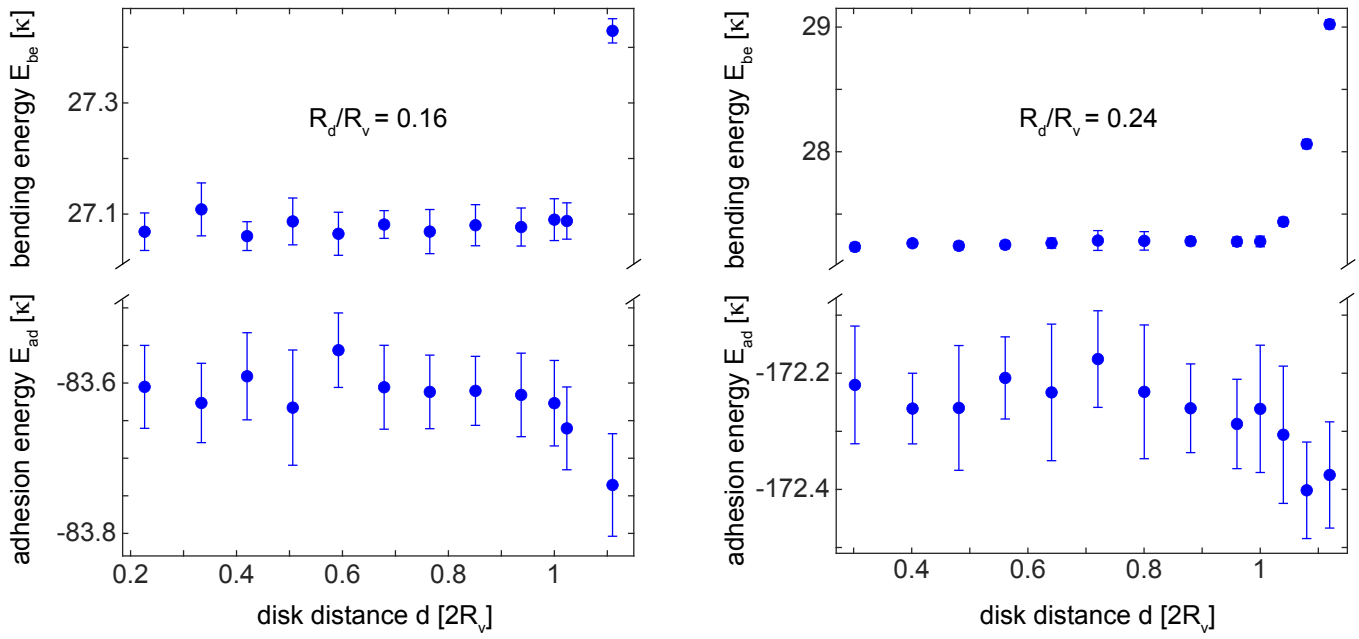

Figure S1. The bending and adhesion energies E_{be}/κ and E_{ad}/κ of a spherical vesicle with small disks of relative sizes $R_d/R_v = (0.16, 0.24)$ corresponding to Figure 2 of the main text. Each point reflects the mean and the standard deviation of the energies from ten simulations.

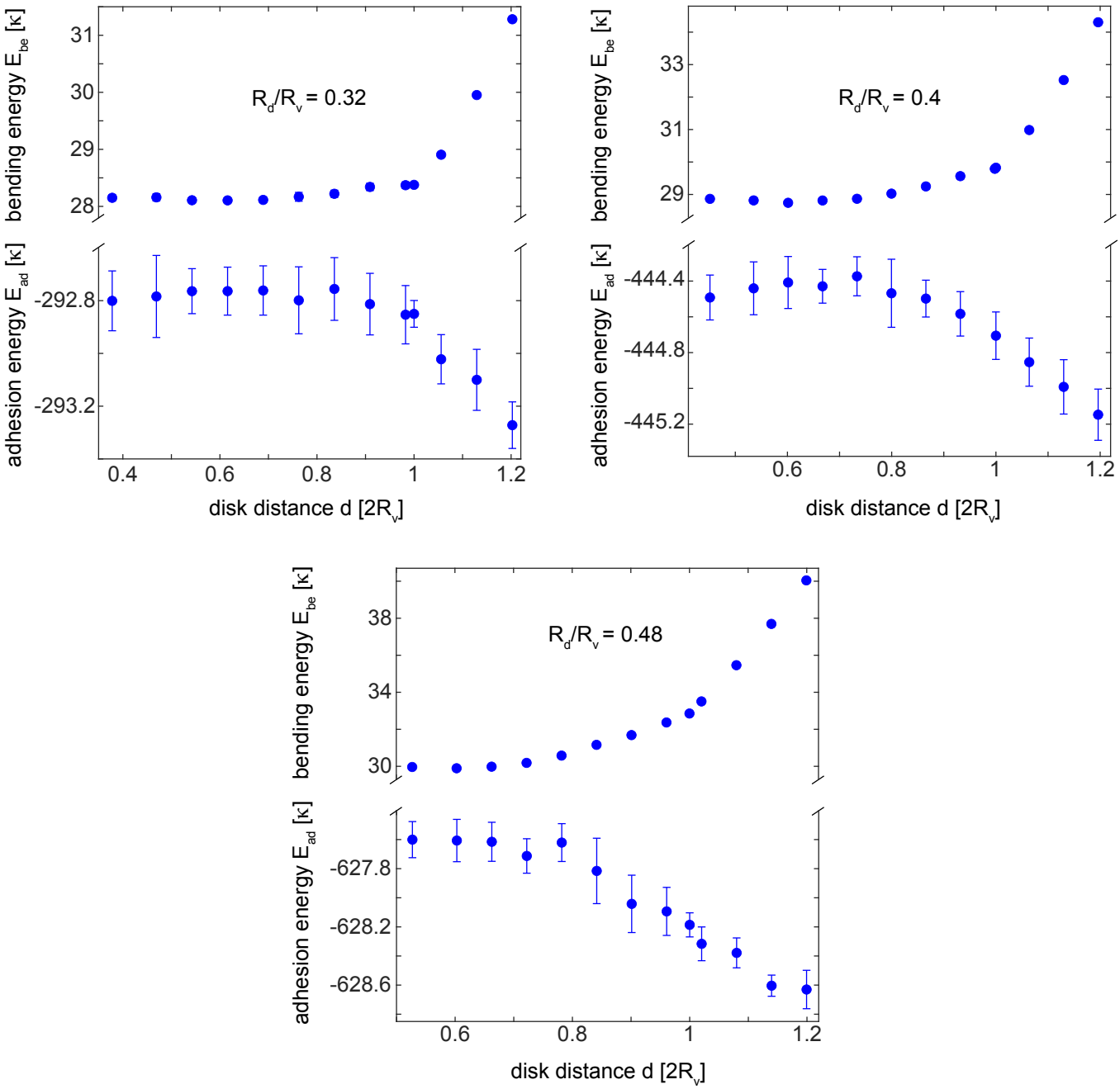

Figure S2. The bending and adhesion energies E_{be}/κ and E_{ad}/κ of a spherical vesicle with large disks of relative sizes $R_d/R_v = (0.32, 0.4, 0.48)$ corresponding to Figure 3 of the main text. Each point reflects the mean and the standard deviation of the energies from ten simulations.

SUPPLEMENTARY VIDEO

Video S1. Monte Carlo equilibration and subsequent simulated annealing of a spherical vesicle with two disks of size $R_d/R_v = 0.32$ distanced at $d/(2R_v) = 0.62$. The two disks freely rotate in the frontal plane yz as shown in Figure 1A.