

S1 Table: Simulation parameters

Parameter	Description	reduced unit	SI unit
T	Temperature	1.0	310 K
$k_B T$	Thermal energy	1.0	4.28×10^{-21} J
ϵ	LJ parameter	$0 - 1.0 k_B T$	
σ	Bead diameter	1.0	30 nm
R_c	Confinement radius	$20 - 164 \sigma$	
k_{spring}	Spring constant	$100 k_B T / \sigma^2$	0.0005 Jm^{-2}
l_p	Persistence length	5.0σ	
k_{bend}	Bending stiffness	$5.0 k_B T$	21.4×10^{-21} J
τ	Brownian time	$3\pi\eta\sigma^3/k_B T$	60 μ s
Γ	Damping coefficient	10.0τ	
Δt	Time step	0.01τ	

Table: We used reduced unit during the simulation.