## Supplementary Material: Target Search of a Polymer with an Active Head

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## Figures



Fig. S1. (a) Plots of  $\left\langle \overline{\delta r_{\text{COM}}^2(\tau)} \right\rangle vs \tau$  of the polymer at different Pe. (b) Plots of  $\alpha_{\text{COM}}(\tau) vs \tau$  of the polymer at different Pe.



Fig. S2. Plots (a–c) represent displacement distribution functions  $P(\Delta x; \tau)$  of an active head monomer of the polymer at different lag times  $\tau = 250, 500, 1000$ .



Fig. S3. The radial probability density function P(r) of the head, tail, and center of mass (COM) of the passive polymer.

## Movies

The movies illustrate the qualitative difference in the dynamics and search process of the passive and active head monomer of the polymer inside spherical confinement.

- 1. Movie S1: Molecular dynamics simulation of the passive polymer inside a spherical confinement. The passive polymer diffuses slowly and is unable to find the pore.
- 2. Movie S2: Molecular dynamics simulation of the polymer with an active head inside a spherical confinement. The active head monomer moves toward the boundary, finds the pore, and escapes through it.
- 3. Movie S3: Molecular dynamics simulation of an active Brownian particle (ABP) inside a spherical confinement. The ABP shows random motion and moves toward the boundary, finds the pore, and escapes through it.