

## Description of Additional Supplementary Files

File Name: Supplementary Movie 1

Description: Intermittent hopping and trapping of *E. coli* in a 3D porous medium with  $a = 2.5 \mu\text{m}$ . Direct imaging reveals switching between two modes of motion: hopping, in which the cell moves through extended, directed paths through the pore space, and trapping, in which the cell is confined for extended periods of time.

File Name: Supplementary Movie 2

Description: *E. coli* with fluorescently-labeled flagella (magenta) in a 3D porous medium with  $a = 2.5 \mu\text{m}$ . Direct imaging shows that the cell becomes trapped when it encounters an obstruction; however, the flagella continue to rotate as a coherent bundle for much longer than the unconfined run duration. The cell continues to reorient itself while trapped, eventually enabling the flagella to unbundle and re-bundle in a different configuration, which enables the cell to escape its trap and continue to hop through the pore space in a different direction.

File Name: Supplementary Movie 3

Description: *E. coli* with fluorescently-labeled flagella (magenta) in a 3D porous medium with  $a = 2.5 \mu\text{m}$ . Direct imaging shows that the flagella remain bundled during cell trapping, and the cell leaves the trap only when the flagella can become transiently unbundled, further suggesting a correlation between trapping and flagellar bundling.