

Description of Additional Supplementary Files

File Name: Supplementary Movie 1

Description: Corresponding movie to Fig. 3 panels i and j of the main manuscript. The movie shows stereotypical cell tracks for wild-type cells in medium with increased viscosity (left) and regular medium (right). Swimming speed is encoded by color according to the color bar on the right.

File Name: Supplementary Movie 2

Description: Movie extracted from the numerical simulation. FlaA-only (left) and FlaBonly flagellar filaments (right) rotate clockwise with a motor torque of $6.5 \text{ pN}\mu\text{m}$ (see also Fig. 4 of the main manuscript). The only differences between the two simulations are the helix parameters that were experimentally measured (Supplementary Table 6). The simulation is visualized using OVITO.