

## Electronic Supplementary Information:

### Dynamic self-assembly of motile bacteria in liquid crystals

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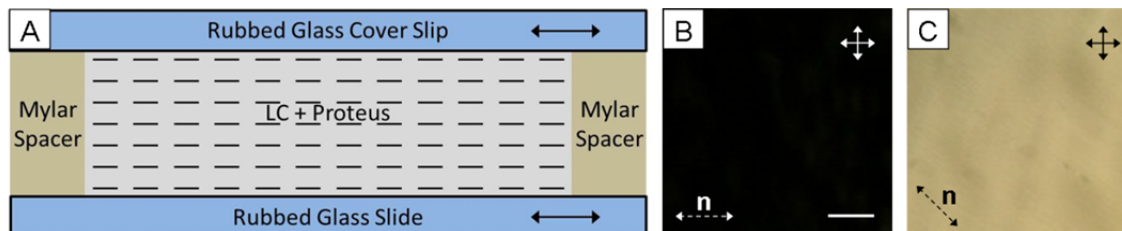
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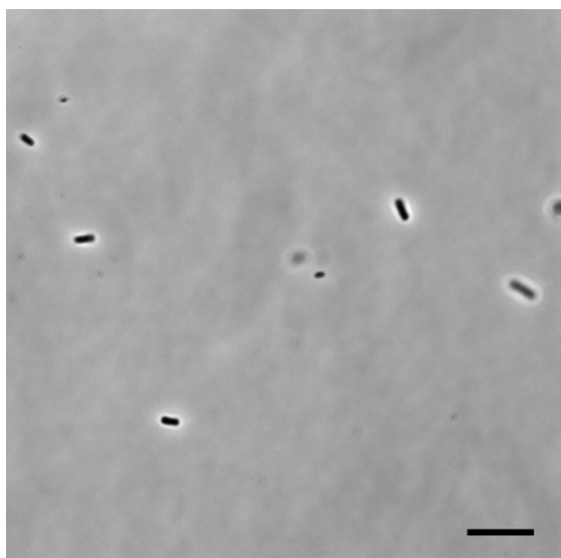
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### Figures



**Fig. S1.** Experimental setup. (A) A schematic illustration depicting imaging chambers used to analyze bacterial cells in LC solutions. The double-headed arrows indicate the direction of rubbing along the surface of the glass slides. The LC director profile is indicated by the dotted lines. (B, C) Polarized light micrographs of the experimental cell aligned (B) parallel and (C) 45° to one of the crossed polarizers. We confirmed that the alignment of the nematic LC was parallel to the direction of rubbing by inserting a quarter wave plate into the optical path of a microscope and analyzing the appearance of the sample between crossed polars. The scale bar in B is 200  $\mu\text{m}$ .



**Fig. S2.** Bright field micrograph showing non-motile *P. mirabilis-flhDC* cells in an isotropic DSCG solution at 42°C. The scale bar is 10  $\mu\text{m}$ .

### Video Captions

**Video S1.** Bright field optical microscopy video showing anisotropic motion of *P. mirabilis-flhDC* cells in 15 wt% DSCG at 25°C (nematic phase). The LC director is aligned in the x-direction (horizontal direction of movie). Scale bar = 10  $\mu\text{m}$ .

**Video S2.** Bright field optical microscopy video depicting isotropic motion of *P. mirabilis-flhDC* cells in 15 wt% DSCG at 42°C (isotropic phase). Scale bar = 5  $\mu\text{m}$ .

**Video S3.** Bright field optical microscopy video which demonstrates the formation of a linear chain of two motile *P. mirabilis-flhDC* cells in 15 wt% DSCG at 25°C (nematic phase). Scale bar = 5  $\mu\text{m}$ .

**Video S4.** Bright field optical microscopy video depicting the elasticity-mediated formation and subsequent dissociation of a linear chain of motile *P. mirabilis-flhDC* cells in 15 wt% DSCG at 25°C (nematic phase). Scale bar = 5  $\mu\text{m}$ .

**Video S5.** Bright field optical microscopy video in which a linear chain of motile *P. mirabilis-flhDC* cells in 15 wt% DSCG at 25°C dissociates (nematic phase). Scale bar = 5  $\mu\text{m}$ .