Supplementary Material

# Supplementary Data

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# Supplementary Figures and Tables

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## Supplementary Figures

**Supplementary Table 1.** Amino acid variations of gliding related proteins in M129 and FH strains.



*a*Locus-tag is as in the sequence under accession number CP003913 for M129-B7.

*b* The values are for M129.

*c* The variations were detected in FH against M129.

*d* The amino acids are written the order M129-FH.

**Supplementary Figure 1. Multiple sequence alignments for P1 adhesin of M129 and FH strains.** The symbols“\*” “:” “.” indicate fully conserved residue, conservation between groups of strongly similar properties, and conservation between groups of weakly similar properties, respectively.



**Supplementary Figure 2. Multiple sequence alignments for P40/P90 of M129 and FH strains.** The symbols“\*” “:” “.” indicate fully conserved residue, conservation between groups of strongly similar properties, and conservation between groups of weakly similar properties, respectively.



**Supplementary Figure 3. Work performed by stepwise movements.** The scatter dot plot of works calculated from individual steps is shown with average (thick line) and standard deviation (thin lines).

**Supplementary Video 1. Stall force measurement in M129 strain.** A polystyrene bead was attached to the back end of cell body. The cell pulled the bead from trap center of optical tweezers. The video was played at 5 × speed.

**Supplementary Video 2. Stall force measurement in FH strain.** A polystyrene bead was attached to the back end of cell body. The cell pulled the bead from trap center of optical tweezers. The video was played at 5 × speed.

**Supplementary Video 3. Gliding movement of M129 strain cells.** Cells bound to the SOs-coated glass surface were observed by phase-contrast microscopy. The video was played at 5 × speed.

**Supplementary Video 4. Gliding movement of FH strain cells.** Cells bound to the SOs-coated glass surface were observed by phase-contrast microscopy. The video was played at 5 × speed.