

## Supplementary methods

**Plasmid construction.** The DNA encoding FimA without signal sequence was amplified from the *E. coli* strain W3110 with a 3' primer encoding a linker and an additional FimA donor strand. This fragment was cloned into pET-11a (Novagen) yielding plasmid pFimA<sub>A</sub>. It encodes mature FimA with the C-terminal extension GGGGGGAATTVNGGTVHFKGEVVNA under control of the T7 promoter.

**Protein expression and purification.** FimC, FimC<sub>His</sub>, and FimD<sub>N</sub> were expressed and purified as described (Hermanns et al., 2000; Nishiyama et al., 2003; Vetsch et al., 2004). For isolation of FimA, *E. coli* W3110 was grown in LB medium at 37 °C. Type 1 pili were sheared off mechanically and precipitated first with 100 mM MgCl<sub>2</sub> and then with 3 M (NH<sub>4</sub>)<sub>2</sub>SO<sub>4</sub>. Edman sequencing confirmed the identity of FimA. To obtain monomeric FimA, pili were incubated for 16 hours at 25 °C in 20 mM sodium phosphate, 8.2 M GdmCl, pH 6.0. GdmCl was subsequently removed on a desalting column equilibrated with 20 mM Tris/HCl, pH 8.0 at 4 °C. The FimC<sub>His</sub>:FimA complex was formed by addition of one molar equivalent of FimC<sub>His</sub>. Homogeneous 1:1 complex was obtained through cation exchange chromatography at 4 °C in 20 mM MOPS/NaOH, pH 6.7 (elution with NaCl gradient). The fractions containing FimC<sub>His</sub>:FimA were immediately desalted on a column equilibrated with 20 mM Tris/HCl, pH 8.0.

FimA<sub>A</sub> was expressed at 37 °C in the cytoplasm of *E. coli* strain BL21(DE3) carrying pFimA<sub>A</sub>. After growth to an optical density of 1 at 600 nm, expression was induced IPTG (1 mM). Bacteria were grown further for 4 hours and harvested. Inclusion bodies of FimA<sub>A</sub> were isolated as described (Rudolph and Lilie, 1996) and dissolved in

50 mM Tris/HCl, 6 M GdmCl, 1 mM EDTA, 50 mM DTT, pH 8.0. This solution was applied to a gel filtration column equilibrated with 20 mM Tris/HCl, 6 M GdmCl, 0.1 mM EDTA, pH 8.0. Eluted FimA<sub>A</sub> was diluted to 20 μM and CuCl<sub>2</sub> (0.2 mM) was added to catalyze formation of the disulfide bond in FimA<sub>A</sub> through air oxidation. After dialysis against 10 mM Tris/HCl, pH 8.0, FimA<sub>A</sub> was purified by anion exchange chromatography. The column was equilibrated in the same buffer and eluted with a NaCl gradient.