Abstract Submitted
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Mechanical Properties of Type IV Pili in *P. Aeruginosa* SHUN LU, AHMED TOUHAMI, University of Guelph, EDIE SCHEURWATER, HANJEONG HARVEY, LORI BURROWS, McMaster University, JOHN DUTCHER, University of Guelph — Type IV pili (Tfp) are thin flexible protein filaments that extend from the cell membrane of bacteria such as *Pseudomonas aeruginosa* and *Neisseria gonorrhoeae*. The mechanical properties of Tfp are of great importance since they allow bacteria to interact with and colonize various surfaces. In the present study, we have used atomic force microscopy (AFM) for both imaging and pulling on Tfp from *P. aeruginosa* (PAO1) and from its PilA, PilT, and FliC mutants. A single pilus filament was mechanically stretched and the resulting force-extension profiles were fitted using the worm-like-chain (WLC) model. The statistical distributions obtained for contour length, persistence length, and number of pili per bacteria pole, were used to evaluate the mechanical properties of a single pilus and the biogenesis functions of different proteins (PilA, PilT) involved in its assembly and disassembly. Importantly, the persistence length value of ~ 1 μm measured in the present study, which is consistent with the curvature of the pili observed in our AFM images, is significantly lower than the value of 5 μm reported earlier by Skerker *et al.* (1). Our results shed new light on the role of mechanical forces that mediate bacteria-surface interactions and biofilm formation. 1- J.M. Skerker and H.C. Berg, Proc. Natl. Acad. Sci. USA, 98, 6901-6904 (2001).

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