

Abstract Submitted
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Bacterial Pili mechanics and dynamics at the Nanoscale GLENN GRISSOM, AHMED TOUHAMI, University of Texas at Brownsville — The adhesion of bacteria to surfaces plays an important role in disease, providing the critical first step in the biofouling of a surface and in biofilm formation. Initial stage of adhesion involves thin appendages called pili present on the surfaces of many gram-negative bacteria. The aim of the present study is to determine the molecular forces required to evaluate adhesiveness of type I and type IV Pili to substrata. The adhesiveness of single bacteria cell to substrata as a function of pili expression are investigated using an AFM cantilever as a force transducer. This work is particularly innovative in that, for the first time, the extension and retraction dynamics of a single pilus are monitored by fluorescence and simultaneously the adhesion force are assessed by AFM force spectroscopy. Insight gained from this study of this simple model system will be applicable to more complex bacterial pathogens and will enhance our ability to inhibit their adhesion to surfaces.

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