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Roles of Pel and Psl in very early biofilm development
B.J. COOLEY, TRAVIS THATCHER, GUILLAUME L'HER, ERIN REED, JAMIE STUART, APRIL KISSINGER, VERNITA GORDON, Center for Nonlinear Dynamics and Department of Physics, University of Texas at Austin — Biofilms are dynamic, multicellular communities of unicellular organisms. Biofilms cause many chronic infections; an important case is the opportunistic human pathogen *Pseudomonas aeruginosa*. Bacteria in biofilms produce an extracellular matrix that binds bacteria to each other and to a surface. The two primary extracellular matrix components produced by *P. aeruginosa* are the polysaccharides Pel and Psl. Here we examine the roles of Pel and Psl in the very early stages of biofilm development, just after initial surface attachment. We use high-throughput automated tracking and analysis to compare wild-type bacteria with mutants incapable of producing Pel, Psl, or both. We examine motion on a surface as well as inter-bacterial interactions. These results quantify the unique roles played by Pel and Psl and show an unexpected relationship between Pel expression and adhesion to a surface.

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