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Pel promotes symmetric, short-ranged surface attachment in P. aeruginosa B. J. COOLEY, TRAVIS THATCHER, University of Texas at Austin, SARA HASHMI, Yale University, GUILLAUME L'HER, University of Texas at Austin, AHMED TOUHAMI, DANIELE PROVENZANO, University of Texas at Brownsville, VERNITA GORDON, University of Texas at Austin — Bacterial biofilms are surface mounted, multicellular communities of interacting bacteria that are often associated with chronic infections that resist antibiotics and damage host tissue. Bacteria in a biofilm are bound in a matrix of polymeric materials that adhere the bacteria to the surface, give the system spatial structure, and cluster the bacteria near each other. The opportunistic human pathogen *Pseudomonas aeruginosa* is widely studied as a model biofilm-forming organism. The polymeric matrix of *P. aeruginosa* strain PAO1 biofilms is dominated by two bacteria-produced extracellular polymers, Pel and Psl. We use both optical and atomic force microscopy to examine the roles of these polymers in very early biofilm development, in the hours after initial surface attachment. In agreement with other researchers, we find that Psl mediates strong attachment to a glass surface. Unexpectedly, we find that Pel promotes symmetric attachment, in the form of the rod-shaped bacteria lying flat on the surface, independently of permanent attachment to the surface. Further, the presence of Pel makes adhesion forces more short-ranged than they are with Psl alone. We suggest that these effects may result through synergistic interactions of Pel and Psl in the polymeric matrix.

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