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Matrix polymer species have distinct effects on the mechanics of bacterial biofilms KRISTIN KOVACH, MEGAN DAVIS-FIELDS, VERNITA GORDON, Univ of Texas, Austin — Biofilms are aggregates of microorganisms embedded in a self-produced extracellular polymer matrix. The matrix confers protection to these microorganisms against mechanical and chemical stresses that they may experience in their environment. The bacterium *Pseudomonas aeruginosa* is widely used as a model biofilm-forming organism because it is an opportunistic human pathogen common in hospital-acquired infections, in chronic wounds, and in cystic fibrosis lung disease. *P. aeruginosa* strain PA01 forms biofilms that are primarily structured by the extracellular polysaccharides Pel and Psl. Using bulk rheological measurements, we show that these polysaccharides each play a unique role in the mechanical robustness of the biofilm. Psl increases the elastic storage modulus while Pel increases the ductility of the biofilm. Increased expression of either Psl or Pel increases the yield stress by about the same amount. Identifying the mechanism(s) by which these polymers contribute to the mechanical toughness of the biofilm could allow new approaches to effective biofilm clearance, by revealing targets for disruption that would weaken the biofilm.

Kristin Kovach
Univ of Texas, Austin

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