

Abstract Submitted
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How do bacteria ‘feel’ their environment? MERRILL ASP, ALISON PATTESON, Syracuse University — Bacteria sense and respond to the surfaces they grow on. When a bacteria cell makes contact with a surface, it initiates a program of gene expression that promotes colonization and biofilm formation; yet, the precise mechanisms by which bacteria ‘feel’ their environment remains unclear. To understand this process, we have developed synthetic hydrogels with tunable stiffness and controllable pore size to assess the effects of substrate mechanics on biofilm development. We use time lapse microscopy to track the growth and form of expanding *Serratia marcescens* colonies and traction force microscopy to measure forces the bacteria exert on the surface. We find a specific regime in which biofilm expansion increases with substrate stiffness, unlike what is seen on conventional agar substrates. Our results suggest that the transport and spread of bacteria can be independently modified and controlled by substrate stiffness and new models of biofilm growth based on the contribution of substrate mechanics are needed.

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