

Abstract Submitted
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Measuring Forces of Bacterial Biofilms on Substrates BENJAMIN COOLEY, VERNITA GORDON, Center for Nonlinear Dynamics, University of Texas at Austin — Biofilms are multicellular aggregates of microorganisms with distinct gene expression and often complex spatial structure. Understanding the forces exerted by bacterial biofilms on their substrates could help in understanding damage they cause in industrial settings and to living tissue in biofilm infections. Here we propose a series of experiments to study the forces between biofilms and substrates using rheological and micro-rheological techniques. Polystyrene tracer beads embedded in agar gels can be mapped over the course of biofilm development, and these timelapse motions will show the strain in the substrate. Meanwhile, measurements of the Brownian motion of selected tracer beads can yield information about the microstructure of the agar. For instance, the extent of the Brownian motion will be increased if the agar is stretched apart or broken down. Additionally, tracers in the biofilms themselves would permit the study of the rheology of the biofilms throughout their development.

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