

Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Intercellular interactions in early biofilm formation probed with image analysis and laser trapping VERNITA GORDON¹, UIUC, JACINTA CONRAD, U. of Houston, MAXSIM GIBIANSKY, FAN JIN, UCLA, NYRENE HAQUE, UIUC, DOMINICK MOTTO, Notre Dame, MARGIE MATHEWSON, UIUC, GABE SPALDING, MATTHEW PARSEK, U. of Washington, JOSHUA SHROUT, Notre Dame, GERARD WONG, UCLA — Inter-bacterial interactions are essential to such fundamental phenomena as motility and biofilm development. Many of these interactions are mediated by quorum sensing to coordinate gene expression among groups of cells. Other influences include contact with a common surface and proximity of neighboring cells. All such mechanisms depend strongly on the spatial structure of the system. We investigate the early stages of biofilm formation. These cells show striking cooperative behavior: neighbor proximity and number correlate with the post-division detachment likelihood of daughter cells. To better study the effects of such spatial structure, we develop a platform that uses laser trapping to control bacterial patterning. We place bacteria on a surface with micron-lengthscale precision and reproducibility. This platform allows systematic study of the effects of neighbor number, density, and orientation on intercellular interactions.

¹at University of Texas, Austin, starting summer 2010

Vernita Gordon
UIUC

Date submitted: 20 Nov 2009

Electronic form version 1.4