

Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Physical properties of native bacterial biofilm cells measured by atomic force microscopy¹ KATHERINE AIDALA, Mount Holyoke College, CATHERINE VOLLE, Brown University, MEGAN FERGUSON, SUNY, New Paltz, EILEEN SPAIN, Occidental College, MEGAN NUNEZ, Mount Holyoke College — Atomic force microscopy offers a way to probe physical properties of bacteria that are adhered to a surface. We study early stage biofilms that natively adhere to a glass surface, without artificial fixation methods. We present images and force curves from five different bacteria, consisting of two gram positive and three gram negative strains, as well as both smooth and rough gram negative strains. The linear portion of the approach curve reveals the gram positive strains are stiffer than the gram negative strains. The non-linear portion of the approach curve, determined by the initial interaction between the tip and cell, differentiates the smooth and rough strains. Fixation of free-swimming planktonic cells by NHS and EDC dramatically changed the measured properties. These results can be understood from the structure of the cells.

¹Support provided in part by NSF RUI program #CHE0517998 and the Clare Boothe Luce Foundation.

Katherine Aidala
Mount Holyoke College

Date submitted: 30 Nov 2009

Electronic form version 1.4