Abstract Submitted
for the DFD05 Meeting of
The American Physical Society

Wall climbing in B. subtilis biofilms MICHAEL P. BRENNER, MARCUS ROPER, PANADDA DECHADILOK, Harvard Engineering and Applied Sciences, STEVE BRANDA, ROBERTO KOLTER, Harvard Medical School — B. subtilis produces surfactin which aids its spreading on the buffer, increasing the wetted area of a nutrient substrate. Synthesis of the surfactin polar group is regulated by a so called "quorum sensing" pathway so that effective quantities are produced only when the population density is high. We describe the implications for the simple case of wall-climbing swarms of bacteria, in which Marangoni stresses drive the swarm against gravity up an angled substrate, prior to the synthesis of an exopolysaccharide matrix that leads to the formation of a floating pellicle. Wrinkles observed on the mature pellicle are related to the familiar 'tears of wine' instability.

Marcus Roper
Harvard Engineering and Applied Sciences

Date submitted: 11 Aug 2005 Electronic form version 1.4