Abstract Submitted
for the DFD10 Meeting of
The American Physical Society

Bacteria swimming in a wall-bounded shear flow studied with microfluidic-DHM[1] H. AGARWAL, U. of Minnesota, M. BARRY, R. STOCKER, MIT, J. SHENG, U. of Minnesota — Observations of bacterial motility in a wall-bounded shear flow are crucial to understand cell attachment at the onset of biofilm formation. We combined microfluidics and holography to measure 3-D trajectories of *Escherichia coli* in shear flows, for shear rates up to 200/s. Acquisition of >3,000 trajectories over short times (5 min) enabled the robust quantification of swimming velocities and dispersion coefficients. We find that near-wall hydrodynamic interactions, including swimming in circles and the reduction in tumbling frequency, reduce the wall-normal dispersion of bacteria, favoring surface attachment. Preliminary results on the effect of shear will also be discussed.

[1]Supported by NIH and NSF

Jian Sheng
University of Minnesota

Date submitted: 06 Aug 2010 Electronic form version 1.4