Abstract Submitted
for the DFD17 Meeting of
The American Physical Society

Integrating fluid dynamic and biologic effects on staphylococci bacteria biofilms ERICA SHERMAN, UNL, JENNIFER ENDRES, KENNETH BAYLES, UNMC, TIMOTHY WEI, UNL — *Staphylococcus aureus* bacteria are able to form biofilms and distinctive tower structures that facilitate their ability to tolerate treatment and to spread within the human body. The formation of towers, which break off, get carried downstream and serve to initiate biofilms in other parts of the body are of particular interest here. In previous work on biofilm growth and evolution in steady, laminar microchannel flows, it has been established that tower formation occurs around a very limited range of applied shear stresses centered on 0.6 dynes/cm^2. Quantifying cell density characteristics as a function of time during biofilm formation reveals indicators of tower development hours before towers actually form and become visible. The next step in this research is to explore biological factors that might explain why this specific shear is so important. Additional studies with mutants, *e.g.* ica-A, that have been tied to tower formation have been conducted. The shear dependence of these mutants and their correlation to the behavior of wild type *S. aureus* is examined.

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Date submitted: 01 Aug 2017 Electronic form version 1.4