Meeting: 1003, Atlanta, Georgia, SS 29A, AMS Special Session on Mathematical Sciences Contributions to the Biomedical Sciences, I

1003-92-1565 **David Chopp*** (chopp@northwestern.edu), ESAM, Tech Institute, 2145 Sheridan Rd., Evanston, IL 60208, and **Matthew Parsek** and **Brian Moran**. *Mathematical Modeling of Bacterial Biofilms.*

Bacterial biofilms may be the most common form of life on the planet. Nearly all fluid/solid interfaces host some form of biofilm. Some biofilms are beneficial, and others are destructive. There is much yet to be learned about the aggregation of cells, and their subsequent differentiation into structured biofilms. Some biofilms are able to monitor their local population density, and control their group behavior through the use of signal molecules. When a threshold concentration of the signal in the biofilm is reached (called quorum sensing), the population may change behavior in a fundamental way. In this talk, we will explore a mathematical description of biofilms and quorum sensing. The model will be tied to experiments on the bacterium *Pseudomonas aeruginosa*, which is the most common form of infection for people with cystic fibrosis. We will use the model to predict the onset of quorum sensing, which is the trigger for P. aeruginosa to become virulent. Within this context, we will also discuss the origins of this collaboration between a mathematician and a biologists and how this collaboration works in practice. (Received October 05, 2004)