Electrochemically Monitoring Single Cells with Nanofluidic Sensors

Thaddaeus A. Webster
Department of Chemical Engineering
Northeastern University
Boston, MA 02115

Pseudomonas aeruginosa is one of the leading causes of pneumonia, yet little is known about how this organism causes so much havoc. Pyocyanin, an electroactive virulence factor and signaling molecule, is excreted by *P. aeruginosa* continuously and has been linked to several negative effects within hosts. A platform utilizing microfluidic channels and valves with integrated nanofluidic electrochemical sensors is proposed as a means of capturing individual bacterial cells and monitoring the electroactive molecules it excretes when exposed to chemical stresses. Preliminary data suggest that pyocyanin can effectively be detected by nanofluidic electrodes that have been constructed.