Department of Molecular and Cellular Biology

Graduate Seminar MCB*6500

Friday, May. 25, 2018 in SSC 1511 @ 12:45 p.m.

presented by:

Laurenne Petrie

(Advisor: G. Cox)

"Characterization of the role of *Staphylococcus aureus* cell-wall anchored proteins in adhesion to nasal epithelial cells"

Staphylococcus aureus colonizes the skin and nares of ~30% of the population and is a major cause of nosocomial infections. Despite *S. aureus* innocuously residing in the nose of healthy individuals, S. aureus isolates from postoperative infections are often identical to those isolated from the patient's nares. Colonization is mediated by cell wall-anchored proteins (CWAs) that decorate the surface of the cell. CWA proteins facilitate adhesion to the nasal epithelium through interactions with fibrous proteins that constitute the extracellular matrix (ECM). Research has indicated that several of these CWAs are necessary for S. aureus adherence to nasal cells and may also present novel targets for inhibiting colonization. Recent years have seen a steady decline in our ability to eliminate S. aureus with current antibiotics and the need for innovation is greater than ever. I hypothesize that by identifying genes essential to the nasal cell adhesive process we can better characterize the mechanisms involved in adhesion and we can determine if targeting CWAs is a viable therapeutic strategy. During my project, I will focus on the development of an adhesion assay that will be used to characterize the binding of *S. aureus* to nasal epithelial cells and their various ECM-associated polymers. I will then employ this assay to screen an MRSA USA300 Transposon Mutant Library, a collection of ~1952 strains with mutations in single, non-essential genes, to identify genes that result in a decrease in adherence. Null mutants of such genes will then be screened using a *Caenorhabditis elegans* infection model in order to confirm if a decrease in adhesion also results in a decrease in virulence.

■ *MCB Brown Bag Seminar*