

CHMI 4615 Seminar

Antimicrobial Activity of Liposomal Tobramycin-Bismuth Against *Pseudomonas aeruginosa*

By Crystal Dorval

Date: Monday, November 2nd, 2009

Time: 12:30 p.m.

Place: Room S-217

Abstract: Chronic lung infection is the main cause of morbidity and mortality in patients suffering from Cystic Fibrosis (CF). Due to excessive mucus secretion in CF patients, they have impaired mucociliary clearance and bacterial colonization is inevitable in this nutrient rich environment. Once colonized in the lung, mucoid phenotypes of *P. aeruginosa*, which form alginate-containing biofilms, are very difficult to eradicate, especially with the ever emerging antimicrobial resistant strains. Since aminoglycosides alone are not sufficient to eradicate these persistent biofilms in non-toxic doses, adding bismuth to this antibiotic as well as encapsulating them into liposomes increases bacterial susceptibility while decreasing toxicity. In addition, Alginate Lyase (AlgL) cleaves the alginate surrounding these bacteria, which can facilitate antimicrobial penetration. A synergistic approach of combinational therapy consisting of liposomal tobramycin-bismuth alongside AlgL is intended to increase susceptibility of *P. aeruginosa* biofilms by reducing alginate and allowing the encapsulated antimicrobial to penetrate the bacteria.