PURDUE UNIVERSITY | Department of Industrial and Molecular Pharmaceutics

Industrial & Molecular Pharmaceutics Seminar

IMPH 69600

Wednesday, March 6, 2024
4:30 PM in RHPH 164

"Liposomal Formulation of Bacteriophages for Pulmonary Delivery"

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First Seminar

The rising surge of antimicrobial resistance has promoted interest in bacteriophage (phage) therapy as an alternative to conventional antibiotics. Phages (viruses infecting bacteria) are currently in clinical trials, with inhaled phage therapy being explored for the treatment of respiratory infections. A major determinant in the efficacy of inhaled phage therapy is having an optimum phage titer to kill the bacteria at the lung infection site. However, phage viability can be lost while formulating and on delivery. Additionally, recent studies have reported that phages can have non-specific interactions with epithelial cells, resulting in cellular internalization. Consequently, this could result in a reduction of phages available to act against the bacteria at the infection site (more specifically against extracellular bacteria).

This study aims to encapsulate phages (specific to the bacteria *Pseudomonas aeruginosa*) in liposomes to reduce the cellular uptake of phages. Our preliminary experiments show that phage cellular uptake by lung epithelial cells for the liposomal formulation is significantly reduced in an *in vitro* model as compared to pure phage suspension. Future work will focus on *in vitro* and *in vivo* bacterial killing activity of our liposomal formulations.