NJIT New Jersey Institute of Technology

BME

Department of Biomedical Engineering
Graduate Seminar

Date	Location	Time
Wednesday, November 13th	Fenster Hall 698	2:30 PM

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Engineering Platforms for Infectious Diseases Research

Abstract:
Infectious diseases caused by bacteria are responsible for millions of new infections and deaths per year. The continued spread of drug resistance, both in terms of geography and extent of resistance to approved therapies, represents a global health pandemic. To address this issue we have focused on novel approaches to discover antibacterial small molecules and probe their mechanism of action. We have sought to learn about the ideal characteristics of an antibacterial drug and its companion bacterial drug target/s. A new antibacterial critically must modulate the activity of a primary target distinct from those perturbed by current drugs. With this goal in mind, we have pursued programs principally focused on the causative agent of tuberculosis– *Mycobacterium tuberculosis*. To translate toward successful outcomes, we have developed novel platforms in computation (machine learning) and biology (intrabacterial drug metabolism) which have been blended with medicinal chemistry heuristics. Their application to two main programs will be described that have afforded 1) a lead compound that achieves bactericidal activity through the release of NO• and inhibition of an enoyl-ACP reductase and 2) a preclinical drug candidate with potent modulation of a β-ketoacyl synthase. In addition, a recent extension of the machine learning technology to S. aureus will be discussed that has resulted in an in vivo active small molecule that elicits a genetically validated pathway of resistance.

Light refreshments will be served.