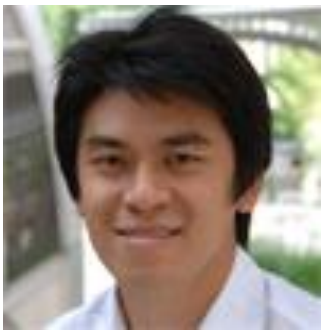
Chemistry 501 Seminar

Thursday, January 26, 2012
3:45 p.m. Buehler 415
Seminar Webcast
Refreshments in Buehler 412 at 3:30 p.m.



THE ROCKEFELLER UNIVERSITY
Science for the benefit of humanity

Dr. Howard Hang

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Hosted by Dr. Michael Best

"Chemical Reporters for Dissecting Host-pathogen Interactions"

Introduction

The Hang laboratory is interested in developing chemical inhibitors of microbial virulence mechanisms to treat infections. The injection of bacterial protein effectors into host cells through type III secretion systems (T3SSs) is essential for Salmonella invasion and replication. Furthermore, the needle complexes of T3SSs are conserved and crucial for the virulence of many gram-negative bacterial pathogens, making T3SSs attractive targets for antibacterial virulence inhibitors. Toward this goal, the Hang laboratory has developed a high-throughput assay for type III protein secretion and discovered chemical inhibitors of T3SSs from plant extracts that block Salmonella infection of host cells. The discovery of plant metabolites that inhibit T3SSs provides lead compounds for the development of new antibacterial virulence drugs and raises interesting questions about the how plants interact with microbial pathogens in the environment.

Abstract

Understanding the complex interactions between microbes and host cells is crucial for identifying mechanisms of microbial pathogenesis and therapeutic development. While genetic methods have revealed key factors involved in microbial pathogenesis, many molecular mechanisms are still unclear. To dissect the complex interactions between microbial pathogens and host cells, our laboratory has developed chemical reporters of posttranslational modifications (lipidation and acetylation) and bioorthogonal ligation methods to identify important regulatory mechanisms that are crucial for microbial infection. These studies have begun to reveal key protein modifications that are essential for infection and should guide the development of new antimicrobial strategies.

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