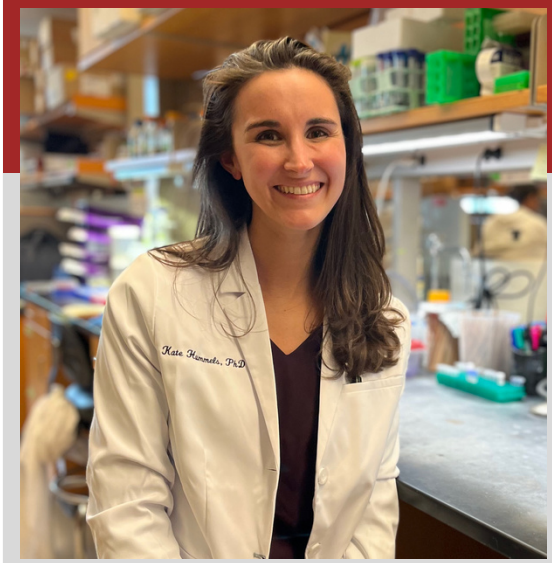

Department of Microbiology

MICROBIOLOGY FACULTY CANDIDATE

Dr. Katherine Hummels

Coordination of Lipopolysaccharide and Peptidoglycan Biosynthesis in Pseudomonas aeruginosa

ABSTRACT

Gram-negative bacteria are characterized by a 3-layered cell envelope with a inner membrane made up of phospholipids, a cell wall composed a peptidoglycan (PG), and an asymmetric outer membrane with phospholipids in the inner leaflet and lipopolysaccharide (LPS) in the outer leaflet. Although the metabolic pathways responsible for building the cell envelope are well characterized, little is know about how these pathways are coordinated to ensure uniform cell envelope expansion. Here, I will describe a novel regulatory interaction between the committed enzymes in the LPS and PG biosynthetic pathways in Pseudomonas aeruginosa. I will show that the PG synthesis enzyme MurA interacts directly and specifically with the LPS synthesis enzyme LpxC to activate LPS production. Finally, I will provide evidence that this non-canonical function of MurA is essential for P. aeruginosa viability. These results support a model in which the assembly of the PG and OM layers in many proteobacterial species is coordinated by linking the activities of the committed enzymes in their respective synthesis pathways.

Thursday, March 16, 2023 - 11:10am
404D Biological Sciences Building