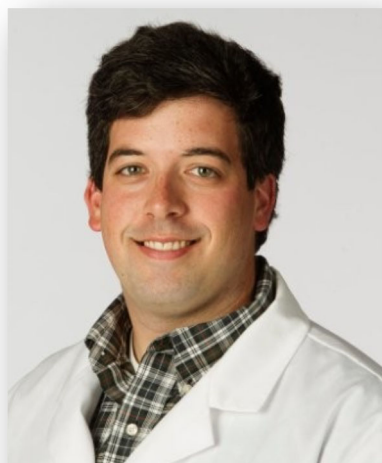


BIOCHEMISTRY SEMINAR SERIES

Postdoctoral Presentation - Spring 2021

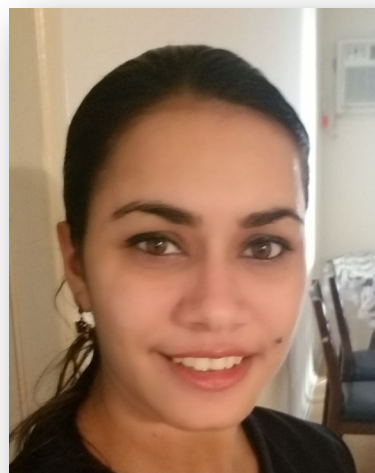


“Leveraging a new fluorescent fusion sensor reveals that bacterial chaperones associate with one another to rapidly transfer heme”

Brendan Mahoney, Ph.D.
Clubb Group

In order to mount an infection, bacterial pathogens acquire the essential nutrient iron from their host in the form of heme. In *Corynebacterium diphtheriae*, highly conserved CR-domain chaperones bind heme tightly and transfer it from the cell surface to the bacterial membrane. We have used nuclear magnetic resonance and X-ray crystal structures to determine how CR domains bind heme with high affinity. Surprisingly, using a new chemical biology tool we have discovered that these chaperones possess the unique ability to transfer heme between each other at rates that are 50,000-fold faster than the rate at which they release heme into the solvent. Here we present recent discoveries about the molecular basis of heme transfer toward the ultimate goal of developing new approaches to disrupt heme transfer that would effectively starve pathogens of iron during infections.

“Disassembly of fascin bundled actin filaments via their oxidation by Mical”



Sudeepa Rajan, Ph.D.
Reisler Group

F-actin is a major component of cell structures, including lamellipodia and filopodia, which are involved in cell motility and cell sensing depending on the cues from the microenvironment. Fascin, a key F-actin bundling protein, plays an important role in stabilizing actin filaments in filopodia and lamellipodia. Although previous studies have shown how the actin-bundling assembly takes place, the mechanism of these bundles disassembly is poorly understood or unknown. In the present study, we investigated how the MICAL family of monooxygenase is involved in disassembly of fascin bundled actin. Using light scattering and low-speed pelleting assays, we showed that the fascin bundled actin disassembles much faster in the presence of Mical compared to that in its absence. Moreover, this disassembly is further enhanced upon cofilin addition. Overall, these results shed new light on the disassembly mechanism of fascin bundled actin.

Friday, April 23, 2021

via Zoom

3:30 pm