Bio: Casey Theriot

Dr. Casey Theriot completed her graduate work in the Department of Microbiology at North Carolina State University where she focused on an Archaeal organism native to deep-sea hydrothermal vents. She worked closely with The Army Research Office during this time to engineer proteins from *Pyrococcus* species for stable and long term detoxification of nerve agents. The transition from this to the gastrointestinal tract was not difficult because both environments are complex and require new tools, including metabolomics, to study them.

Dr. Theriot came to The University of Michigan to complete postdoctoral training with Dr. Vincent Young who is a leader in the field of microbial ecology and bacterial pathogenesis. She currently works in a multidisciplinary collaborative environment that bridges research at the bench and research in the hospital. Dr. Theriot's research focuses on defining the gastrointestinal tract microbiome and metabolome during different disease states to understand how perturbations to this system affect human health. Colonization resistance describes the ability of the gastrointestinal tract to prevent colonization by pathogens. Currently, she is exploring the interactions between the gut microbiota and the pathogen *Clostridium difficile,* a significant and re-emerging public health problem. *C. difficile* infection (CDI) is the leading nosocomial infection in the United States and is becoming more commonplace in Europe. A major goal of her work is to create an integrated model of the complex interactions among the gut microbiota, pathogen and host. To accomplish this she integrates data obtained from high-throughput methods that analyze the gut microbiome, metabolome and host immune responses in mouse models and human biological specimens.

Lecture Topic

"The Gut Microbiome and Metabolome in Susceptibility to *Clostridium difficile* Infection"

Clostridium difficile infection following the administration of antibiotics is the most common hospital-acquired infectious disease. There has been a recent increase in deaths and healthcare costs associated with *C. difficile* infection. This infection produces a range of disease from mild diarrhea to severe inflammation of the colon. Major risk factors for getting this infection include staying in the hospital and taking antibiotics. We know that antibiotics change the makeup of the "good" bacteria in the gut, but we do not know how this allows "bad" bacteria to flourish. In this study, we show how antibiotics not only change the bacterial makeup of the gut but also shape the nutrients there. Furthermore, we show that *C. difficile* uses many of these nutrients as a food source boosting both germination and growth. This is the first study to examine how bacteria in the gut shape the nutrient environment and foster the growth of this persistent pathogen. We hope that new treatments to combat this infection will arise from these findings.