NC STATE UNIVERSITY

Comparative Medicine Institute

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https://theriotlab.org/

Title: Mechanisms of Colonization Resistance against *C. difficile*

Research emphasis:

The Theriot laboratory is interested in understanding how antibiotics alter the gastrointestinal microbiota and metabolome to allow for *Clostridium difficile* colonization and infection. We use relevant animal models of disease to study the bacterial communities and metabolites required by *C. difficile* to colonize the gut. We also use *in vitro* and *ex vivo* models to test hypotheses regarding *C. difficile* colonization. Currently we are exploring the role of microbial-mediated bile acids in altering colonization of the pathogen *C. difficile*, the gut microbiota, and the host response.

Application :

- Microbiomics
- Metabolomics
- Infectious disease
- Anaerobic microbiology

Collaboration potential:

- Small animal models for biomedical applications (mouse)
- Microbiome and metabolomic data analysis and visualization
- Anaerobic bacterial cultivation and isolation
- Targeted bacterial therapy design

Selected publications:

Theriot CM, Koumpouras CC, Carlson PE, Bergin II, Aronoff DM, Young VB. Cefoperazone-treated mice as an experimental platform to assess differential virulence of *Clostridium difficile* strains. Gut Microbes. 2011 Nov-Dec;2(6):326-34.

Theriot CM, Koenigsknecht MJ, Carlson PE Jr, Hatton GE, Nelson AM, Li B, Huffnagle GB, Z Li J, Young VB. Antibiotic-induced shifts in the mouse gut microbiome and metabolome increase susceptibility to *Clostridium difficile* infection. Nat Commun. 2014;5:3114.

Bassis CM*, Theriot CM*, Young VB. Alteration of the murine gastrointestinal microbiota by tigecycline leads to increased susceptibility to *Clostridium difficile* infection. Antimicrob Agents Chemother. 2014 May;58(5):2767-74.

Theriot, CM and VB Young. Interactions between the Gastrointestinal Microbiome and *Clostridium difficile.* Annu Rev Microbiol. 2015 Oct 15;69:445-61. doi: 10.1146/annurev-micro-091014-104115.