TITLE: Ecology of indigenous microbial communities associated with *Clostridium difficile* Infection, periodontal disease, and anxiety disorder.

FACULTY MENTOR:

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RESEARCH PROJECT DESCRIPTION

Humans live in symbiosis with a diverse community of commensal organisms. For example, some 100 trillion microorganisms inhabit and colonize the human gut, and they outnumber our human cells 10 to 1 (i.e. there are more of them living on and inside us than us). These commensal organisms carry a wide range of functions increasingly recognized as mutualistic and indispensable for the health of the host, including proper digestion, immune functions, and importantly, colonization resistance against pathogens. Although the importance of these commensals is widely appreciated, the basic features of indegenous microbial communities and their role in infectious diseases remain poorly understood. My lab is using molecular techniques, high-throughput sequencing, and bioinformatic methods to characterize human-associated microbial communities in association with diseases such as *Clostridium difficile* infection, periodontal disease, febrile neutropenia, and anxiety disorder. Our long-term goal is to identify clinically useful microbial biomarkers or specific bacteria that may be exploited for therapy (e.g. probiotics). Medical students will use molecular techniques such as nucleic acid extraction and PCR to prepare 16S gene segments for sequencing. Experience with molecular biology is required. Knowledge of programming language is a plus. Our projects are supported by the NIH, Florida Department of Health, Industry, and internal funds.