



## The MicroBiome Analysis Center (MBAC)

Director: Patrick M. Gillevet, PhD

### Key Interests

Microbiome Analyses | Molecular Ecology & Evolution | Population Genetics | Molecular Systematics | Conservation Genetics | NextGen Sequencing

### CONTACT

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### FACILITIES & EQUIPMENT

- 10 PCR machines
- ABI 3130xl sequencer
- Life Technologies RT PCR instrument
- Ion Torrent PGM & S5 NextGen sequencer
- High-end computational facilities including a 48 processor HP workstation

### SELECT PUBLICATIONS

- M. R. Laffin *et al.*, Endospore forming bacteria may be associated with maintenance of surgically-induced remission in Crohn's disease. *Sci Rep.* 8, 9734 (2018).
- J. S. Bajaj *et al.*, Antibiotic Associated Disruption of Microbiota Composition and Function in Cirrhosis is Restored by Fecal Transplant. *Hepatology.* (2018).
- J. S. Bajaj *et al.*, Gut microbial RNA and DNA analysis predicts hospitalizations in cirrhosis. *JCI Insight* 3 (2018).

### Research Focus

The MicroBiome Analysis Center (MBAC) focuses on the study of human microbial communities (Human microbiome) that reside in the human gut, mouth, urogenital, and respiratory tracts, to model the interactions between microbiome function and human-derived gene expression. It has now become apparent that the human microbiome is implicated in social behavior, reproduction, growth, cognition, as well as various diseases. The human microbiome is an integral component of the human ecosystem and is a major driver of this system.

MBAC also participates in numerous studies on population genetics, molecular systematics, and conservation genetics using NextGen sequencing technologies. We have a new thrust under the theme of "One Health" that investigates the interconnection of environmental disease, human health, animal health, and ecosystems health.

### MBAC is collaborating with domestic and international partners to advance human health research.

- Based on the working principle that life originated in pre-biotic chemistry, MBAC is exploring the pre-biotic chemistry that could lead to the emergence of existing biogeochemical pathways and cellular life on earth.
- The research team is using systems biology approaches to study the microbiome, metabolome, and limmunome (collectively known as the metabiome) to understand their interactions with each other and their impact on the progression of disease. The ultimate goal is to develop therapies such as fecal microbiome transplant to treat diseases such as inflammatory bowel disease, hepatic encephalitis, and cirrhosis.
- MBAC has patented a compositions and microbiome analysis method to diagnose Colon Disorder. MBAC is working with commercialization partners, Metabiomics and Prescient Medicine, to advance research and development for patient benefit.