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Translational and Comparative Models of Infectious Diarrhea

Research emphasis:

Dr. Gookin's laboratory is interested in finding novel approaches to the treatment of diseases of the gastrointestinal tract that are of comparable importance to human and veterinary medicine. Our research is centered on understanding the host strategy in defense against diarrheal pathogens that infect intestinal epithelia including the protozoal pathogen *Cryptosporidium* and bacterial pathogen Enteropathogenic *E. coli*. Our approaches range from cell culture based to ex vivo to experimentally and naturally-occurring models of enteric infection.

Selected publications:

Kesimer M, Cullen J, Cao R, Radicioni G, Mathews K, Seiler G, Gookin JL. Excess secretion of gel-forming mucins and associated innate defense proteins with defective mucin un-packaging underpin gallbladder mucocele formation in dogs. *PLOS ONE* September 28, 2015; DOI: 10.1371/ journal.pone.0138988

Ghosh A, Borst L, Stauffer SH, Suyemoto M, Moisan P, Zurek L, Gookin JL. Mortality in foster-age kittens is associated with a shift from ileum mucosa-associated *Enterococcus hirae* to colonization by *E. faecalis* and enteropathogenic *E. coli*. *J Clin Micro* 2013;51:3567-3578

Foster DM, Stauffer SH, Stone MC, Gookin JL. Proteasome Inhibition of Pathologic Shedding of Enterocytes to Defend Barrier Function Requires X-linked Inhibitor of Apoptosis Protein and Nuclear Factor- κ B. *Gastroenterology* 2012;143:133-144

Azcarate-Peril MA, Foster DM, Cadenas MB, Stone MR, Jacobi SK, Stauffer SH, Pease A, Gookin JL. Acute necrotizing enterocolitis of preterm piglets is characterized by dysbiosis of ileal mucosa-associated bacteria. *Gut Microbes* 2011;2:234-243

Application:

- Naturally-occurring small animal models of infectious diarrhea
- Intestinal epithelial-pathogen interactions in cell culture, ex vivo and in vivo model systems
- Intestinal epithelial barrier function, repair, and electrolyte transport
- Electrophysiology of epithelia (Ussing chambers)

Collaboration potential:

- Large animal models of gastrointestinal infection and injury (pig, dog, cat)
- Ussing chamber applications in epithelial (electro)physiology
- Clinical gastroenterology applications (e.g. endoscopy)