Postdoctoral Position in the Arthur Lab at UNC Chapel Hill

We are recruiting a postdoc to the Arthur lab!

Our lab studies the interaction between the microbiota and intestinal disease, specifically inflammation, fibrosis and colorectal cancer. https://arthurlab.weebly.com/

For this project, we are specifically recruiting someone with computational expertise, such as in 16S microbiome sequencing and genome alignments. You must also be willing to work with mice and gastrointestinal contents, although training will be provided and the time committed to animal work is minimal. You must have some experience with wet bench – molecular biology skills are a plus (such as cloning and qPCR). We have a fun and hardworking team, which we hope you will join to drive the project described below. We have funding and have validated all tools and techniques involved, so this project is ready for you!

> *Patients with Inflammatory Bowel Diseases (IBD) experience chronic intestinal inflammation as a consequence of inappropriate immune responses to the microbiota. Patients with IBD, particularly Crohn's disease (CD), are at a greater risk of developing co-morbidities including intestinal fibrosis/stricturing and IBD-associated colorectal cancer (CRC). These diseases can be driven by specific strains of Escherichia coli. The CD and CRC microbiomes harbor high loads of mucosal E. coli described as "adherent-invasive E. coli" (AIEC). AIEC have no genomic definition, but instead are distinguished by functional attributes tested through exhaustive in vitro co-culture assays: the ability to adhere to and invade cultured epithelial cells and replicate and persist in macrophages. Our preliminary data indicate that this in vitro AIEC definition may not predict in vivo mucosal colonization, and that specific taxa expand with E. coli and contribute to inflammatory disease. The objectives of this proposal are to thoroughly interrogate the AIEC definition in vivo, define microbiome compositional changes driven by high levels of E. coli in colonic and ileal tissues, and identify candidate factors harbored by E. coli that permit colonization of the inflamed intestine. To this end, we have developed a polymicrobial colonization strategy that uses a novel barcoding technology to easily distinguish genetically similar, but functionally distinct sub-strains of clinical E. coli in a complex community. We have developed this strategy using a collection of well-characterized clinical AIEC and non-AIEC strains isolated from the intestinal mucosa of CD and healthy patients. This novel approach overcomes technological limitations associated with profiling bacterial metagenomes intimately associated with host tissues using molecular barcoded bacterial strains, gnotobiotic mouse models well-established in our lab, and barcode-targeted high-throughput sequencing and genomics. This innovative approach positions us to comprehensively interrogate the AIEC definition and identify molecular features required for colonization of the inflamed intestine. We must understand what microbial features promote mucosal colonization with high-risk E. coli strains in order to identify IBD patients at risk for a complicated disease course.*

The Arthur lab is located in Marsico Hall in the Dept. of Microbiology and Immunology and is also affiliated with two NIH centers: the Center for Gastrointestinal Disease and Biology (CGIBD) and the Lineberger Comprehensive Cancer Center (LCCC). This is a dynamic working environment ideal for postdoctoral fellows to further their knowledge, contribute to important basic and translational scientific research, and for those with PI aspirations, develop their own independent research program. There is ample support for both research and professional development activities. My past postdoctoral fellows are now Assistant Professors at the Dept. of Microbiology, University of South Carolina at Columbia, and the Dept. of Biology at Appalachian State Univ. in NC. There are numerous funding opportunities including NIH and private foundation fellowships (American Cancer Society and Crohn's and Colitis Foundation), as well as NRSA T32 fellowships in Gastroenterology and Cancer Biology.

For more information or to apply, please email ArthurLabUNC@gmail.com with CV and cover letter.

We are also recruiting a postdoc with macrophage expertise to work on an R01-funded project exploring how adherent-invasive E. coli may interact with macrophages to influence intestinal fibrosis.