Humans harbor a complex community of microbes in their gastrointestinal tract, known collectively as the gut microbiota. Despite their valuable contributions to host health, abnormalities in the composition and/or function of gut microbes (dysbiosis) are now increasingly associated with a multitude of complex human diseases, including inflammatory bowel diseases, metabolic syndrome, cancer, and autoimmune diseases. The Ramer-Tait research program aims to: (1) determine the causative relationships between the gut microbiota and chronic, inflammatory diseases, (2) understand how dietary interventions, including dietary fibers, can be used to improve inflammatory diseases via modulation of the gut microbiota, and (3) develop new approaches to disease prevention and treatment that include microbiome manipulation.