Enlightened By Excrements: An Investigation of Parabasalid Diversity in the Gut Microbiome

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Within our gastrointestinal tract, a community of bacteria, archaea, viruses and protists work in tandem to digest nutrients, influence inflammation, and maintain overall health. However, despite protists' fundamental role in this biological ecosystem, they remain sorely understudied. As protists disappear from industrialized microbiomes, the need to study these microbes' mushrooms. Aiming to spearhead this eukaryotic blackbox, my project focuses on isolating novel protists from the Parabasalia phylum to expand a budding biobank. Importantly, although parabasalid protists have been lost in some populations, research has shown that human-associated parabasalid species are also found in animals such as nonhuman primates and ungulates. In collaboration with the Lincoln Park Zoo and The University of Illinois Chicago, we are isolating human-associated protists to establish a pure culture for downstream analysis. In addition to isolating novel protists, I am elucidating three characteristics: who are they, what do they eat, and how do they look. By identifying preferred carbon sources, I delve into what these organisms are consuming within the gut. Using *Tetratrichomonas buttreyi*, I performed growth curves in four unique medias and found that pectin is the preferred carbon source for these microbes. With continued carbon utilization research, I can further characterize the niches found in the order. To investigate morphology, I am performing immunofluorescence microscopy to highlight intracellular and extracellular features within the genus. After DNA extraction and 18s PCR sequencing, I identified a *T. buttreyi* as a commensal protist in Baboons. The phylogenetic tree elucidates this species is also found in pigs. I aim to continue molecular identification, thus growing the biobank and phylogenetic tree. Protists are fundamental to the world around us and the world of microbes within us; understanding them advances medicine, infectious diseases, and ecology.