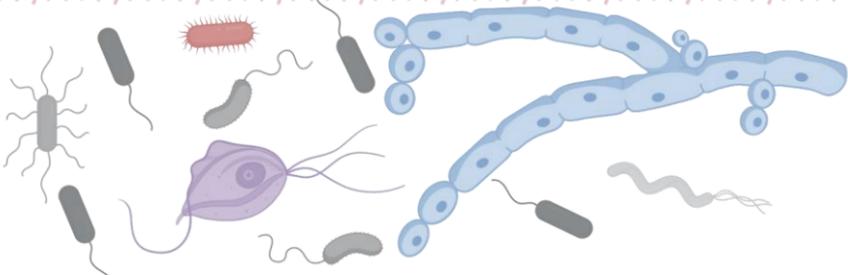


Host-Microbe Interactions at the Barrier Surfaces



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Research Area

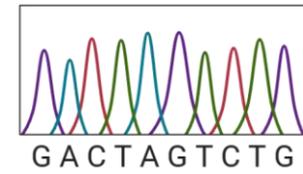
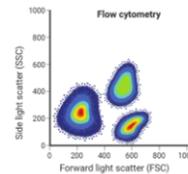
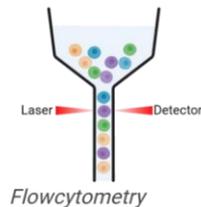
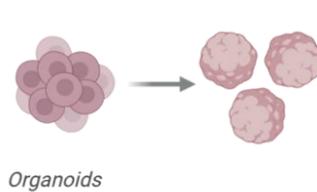
In the Moeller Lab we are focusing on understanding host-microbe interactions at the barrier surfaces, examining their specific molecular mechanisms and how these effects human health and disease.

We are interested in the health promoting protozoa (unicellular organisms) and their positive impact in colitis and potential in Alzheimer, and pathogenic fungi that is especially problematic in patients undergoing chemotherapy.

Methods

- Mouse models; transgenic mice, disease- and infection- models
- Organoids
- Flowcytometry (single cell analysis with antibodies)
- Sequencing, next and third generation (RNA and long read DNA)

- qPCR
- ELISA
- Tissue and cell staining: histology og immunofluorescence

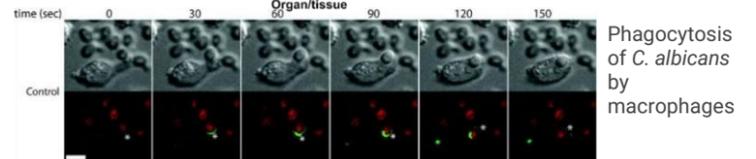
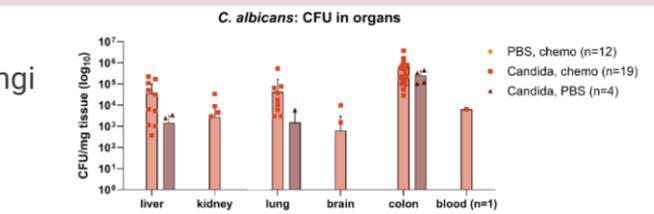


Project Proposals

Fungal Dissemination and Mortality in Patients Undergoing Chemotherapy

Patients in chemotherapy has an 30% increased in mortality as a consequence of fungi dissemination. In this study we investigate, whether *Candida albicans*, prevalent in humans, disseminates though the intestinal barrier. Project ideas include:

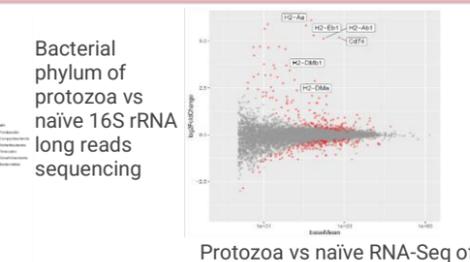
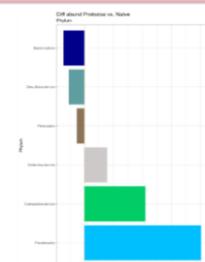
- Implementation of GFP-marked *C. albicans* in mouse models
- Quantification of dissemination by CFU and qPCR
- Examination of infected tissue by histology and immunofluorescence
- Examination of immune cells by flowcytometry



The Impact of Protozoa Colonization on Host Microbiota Composition and Function

One of the effects of protozoa is the modulation of host bacterial composition. In this study we are examining these changes and their impact on host physiology:

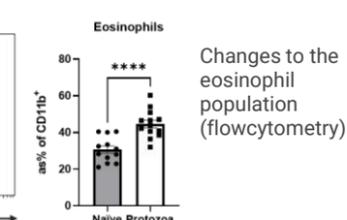
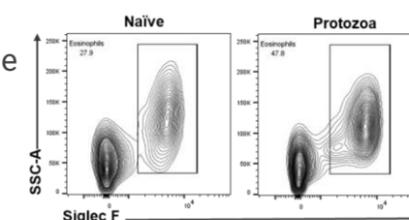
- Changes in bacterial composition by third generation DNA-Seq (long reads)
- Changes in intestinal cells by flowcytometry and RNA-Seq (bulk and single cell, next generation)



Protozoa Effects in Inflammatory Bowel Disease

We are examining the effects of protozoa on the intestinal barrier function in a mouse model of colitis (colonic inflammation). Projects ideas include:

- Disease stratification by qPCR, histology, and immunofluorescence
- Changes in intestinal cells by flowcytometry and RNA-Seq (bulk and single cell)
- Quantification of protozoa in clinical material



Protozoa Effects in Alzheimer: the Gut Brain Axis

Studies shows that patients with late onset and mild Alzheimer has a specific microbial composition. We are examining the metabolites of protozoa in the blood and brain, and their effects on Alzheimer in a mouse model. Project ideas include:

- Alzheimer disease stratification by cognitive tests
- Metabolomic analysis with out partners
- Changes in intestinal cells by flowcytometry and RNA-Seq (bulk and single cell)

