ME-CFS24-003 - Deciphering systemic and mucosal antibody repertoires against the microbiota in ME/CFS and PCC

Zusammenfassung

Myalgic encephalomyelitis/chronic fatigue syndrome (ME/CFS) is a debilitating disease with an unclear etiology and pathogenesis. Similarities between ME/CFS and post-COVID-19 condition (PCC, also known as long-COVID) have been appreciated. In both diseases, an involvement of the immune system and gut microbiota dysbiosis have been implicated in the pathophysiology. For example, using a high throughput antibody assay (Vogl et al., 2021, Nature Medicine), we have shown that ME/CFS patients mount antibody responses in blood against distinct gut microbiota (Vogl et al., 2022, Science Advances). However, if such immune responses also exist in PCC, and how systemic antibodies are relevant to microbiota present at mucosal surfaces remains vastly unknown.

Here in the CFSabs project, we will leverage exceptionally deeply profiled cohorts of ME/CFS and PCC patients assembled by Prof. Untersmayr-Elsenhuber, for which a breadth of biological samples (blood, stool, saliva, mRNA) are available. IgA/IgG from these samples (representing systemic exposures in blood, as well as mucosal ones from the gut and oral cavity) will be analyzed for binding against 357,000 antigens using a proprietary, massively paralleled immune-assay (PhIP-Seq) available in Dr. Vogl's lab. Additionally, mRNA levels of relevant immune barrier proteins in buccal epithelial cells of a sub-group of the cohort will be measured by reverse transcription quantitative polymerase chain reaction (RT-qPCR) to evaluate the oral immune barrier.

Analyzing the convergence of systemic and mucosal responses may shed light on the diseases' etiologies. Comparing immune signatures of ME/CFS vs. PCC patients, as well as healthy controls, may also identify shared and divergent mechanisms as well as diagnostic markers. The results generated with the seed funding provided by this call, will then be leveraged to apply for follow up projects paving the way towards novel therapeutic and diagnostic approaches for both ME/CFS and PCC.

Wissenschaftliche Disziplinen:
Immunology (40%) | Microbiome research (30%) | Data science (30%)

Keywords:
microbiotaantibody repertoiresmachine learning

Principal Investigator:	Thomas Vogl
Institution:	Medical University of Vienna
Co-Principal Investigator(s):	Eva Untersmayr-Elsenhuber (Medical University of Vienna)

Status: Laufend (01.01.2025 - 31.03.2026)

Weiterführende Links zu den beteiligten Personen und zum Projekt finden Sie unter
https://wwtf.at/funding/programmes/ei/ME-CFS24-003/