ME-CFS24-016 - Exploring the Glycome: Identifying Glycosylation-Related Biomarkers for severity stratification in Chronic Fatigue Syndrome

Zusammenfassung

Post-infectious Myalgic Encephalomyelitis/Chronic Fatigue Syndrome (ME/CFS) is a systemic inflammatory condition characterized by severe fatigue, sleep disturbances, intestinal problems and post-exertional malaise (PEM). The cause of the pathology remains elusive and for this reason, treating ME/CSF symptoms remains difficult. In this project, we will test the hypothesis that changes in glycosylation in the peripheral blood of ME/CFS patients is a useful novel biomarker for severity stratification of ME/CFS patients during episodes of PEM and general fatigue. Proper glycosylation helps maintain immune tolerance, while improper glycosylation can lead to inflammation and autoimmunity. The enhanced pro-inflammatory state in post-infectious ME/CFS might lead to a hypo-glycosylated state in the body, which might result in inflammatory immune responses. We will use advanced mass spectrometry to detect changes in sialic acid, O- , N-glycosylation and antibody N-glycosylation as surrogate markers for the damage at the glycocalyx in the peripheral blood of post-infectious ME/CFS patients. Furthermore, we will assess the inflammatory capacity of aberrantly glycosylated antibodies in vitro. Combining our complementary, interdisciplinary expertise of analytical /synthetic chemistry/autoimmunity (Davide Ret) and immunology in the field of rheumatology and autoimmune diseases (Selina Keppler) will enable us to address the biochemical changes as well as the biological implications of aberrant glycosylation during post-infectious ME/CFS. Depending on our results, we will work on approaches how to mitigate and restore aberrant glycosylation using interventions such as sugar supplements or enzyme inhibitors in future follow-up studies. A better understanding of the biological triggers and markers for severity stratification is an important step towards better treatment options.

Wissenschaftliche Disziplinen:
Immunology (30%) | Glycobiology (40%) | Medical chemistry (30%)

Keywords:
ME/CFSglycomicImmunology

Principal Investigator:	Davide Ret
Institution:	TU Wien
Co-Principal Investigator(s):	Selina Jessica Keppler (Medical University of Graz)

Status: Abgeschlossen (01.01.2025 - 31.12.2025)
GrantID: 10.47379/MECFS24016

Weiterführende Links zu den beteiligten Personen und zum Projekt finden Sie unter
https://wwtf.at/funding/programmes/ei/ME-CFS24-016/