



RESEARCH TOPIC CLI1

Precision Medicine in Inflammatory Neuropathies: Antibody and Biomarker Discovery, Validation, and Digital Remote Monitoring

Research area

Medical Area

Clinical Unit name

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Abstract

Chronic inflammatory demyelinating polyneuropathy (CIDP) and multifocal motor neuropathy (MMN) are immune-mediated neuropathies characterized by marked clinical heterogeneity, frequent misdiagnosis, and lack of validated biomarkers for diagnosis, prognosis, and treatment monitoring. This PhD project will be embedded within the Italian CIDP/MMN Registry coordinated by our group, currently the largest worldwide, comprising over 800 CIDP and 100 MMN deeply phenotyped patients with extensive clinical data and available blood samples, and within an ongoing prospective registry of incident, treatment-naïve patients.

The project will focus on two complementary and innovative axes: (1) antibody and biomarker discovery and validation, and (2) development and validation of remote digital monitoring strategies. Using longitudinal biospecimens, the candidate will validate established and emerging autoantibodies (nodal/paranodal, antiganglioside, anti-MAG) and circulating biomarkers (e.g., neurofilaments, complement, cytokines, periaxin, peripherin) in relation to disease phenotype, activity, treatment response, and relapse. In parallel, unbiased antibody discovery pipelines based on tissue and cell-based arrays followed by immunoprecipitation–mass spectrometry will be applied to identify novel pathogenic autoantibodies.

Concurrently, the project will contribute to the implementation and validation of telemedicine, digital applications, and AI-based voice platforms for high-frequency home monitoring of disability and disease activity, assessing feasibility, reliability, and concordance with in-clinic evaluations.

By integrating deep clinical phenotyping, molecular biomarkers, and digital health technologies, this PhD project aims to advance precision medicine in inflammatory neuropathies, enabling earlier diagnosis, improved patient stratification, and personalized monitoring strategies.

Scientific references

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Type of contract

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