



RESEARCH TOPIC MEM7
Prospective longitudinal study for NeuroCOV characterization

Curriculum MEM standard

Research Area

Immuno

Laboratory name

Unit of Clinical and Experimental Immunology

Research Supervisor

Domenico Mavilio domenico.mavilio@humanitas.it

Marinos Kallikourdis marinos.kallikourdis@hunimed.eu

Abstract

Following SARS-CoV-2 infection, long-term neurological and neuropsychiatric complications often occur (NeuroCOVID syndrome) which can have an important impact on the individual's psycho-physical and social well-being. However, NeuroCOVID syndrome characteristics and its underlying pathogenetic processes have not yet been fully described. Therefore, this project aims to describe the NeuroCOVID syndrome through neurological, neuropsychological and psychiatric investigations that will be carried out in a cohort of patients recovered from COVID-19, divided into cases and controls based on the presence of NeuroCOVID syndrome. Peripheral blood samples will be collected from all subjects for the isolation of mononuclear cells. The latter will be: characterized from a phenotypic and functional point of view; sent to project partners to study in vitro/in silico susceptibility to NeuroCOVID through the construction of brain organoids and multiomics analyses.

Main technical approaches

- _ Isolation of mononuclear cells from peripheral blood
- _ In vitro cell culture
- _ In vitro Functional assays
- _ Multiparametric flow cytometry (up to 40 parameters)
- _ Cell sorting
- _ ELISA tests
- _ Bioinformatic analysis of single cell data

Scientific references

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vaccination revealed by temporal single-cell transcriptomics. NPJ Vaccines. 2024 Mar 20;9(1):63. doi: 10.1038/s41541-024-00853-9. PMID: 38509155.

2. Dalu D, Tarkowski M, Ruggieri L, Cona MS, Gabrieli A, De Francesco D, Fasola C, Ferrario S, Gambaro A, Masedu E, Parma G, Rulli E, De Stradis C, Mavilio D, Calcaterra F, Manoni F, Riva A, La Verde N. Antibody response to three-dose anti-SARS-CoV-2 mRNA-vaccination in treated solid cancer patients. Int J Cancer. 2024 Apr 15;154(8):1371-1376. doi: 10.1002/ijc.34817. Epub 2023 Dec 15. PMID: 38100252.

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5. Di Vito C, Calcaterra F, Coianiz N, Terzoli S, Voza A, Mikulak J, Della Bella S, Mavilio D. Natural Killer Cells in SARS-CoV-2 Infection: Pathophysiology and Therapeutic Implications. Front Immunol. 2022 Jun 30;13:888248. doi: 10.3389/fimmu.2022.888248. PMID: 35844604; PMCID: PMC9279859.

Type of contract

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