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### Consortium Partners



# BEHIND-MS

## BEHIND-MS: Bridging EBV-Host Imbalance to Disease Onset and Progression in Multiple Sclerosis

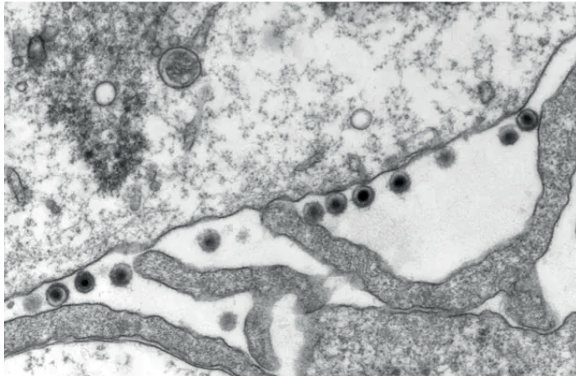
The BEHIND-MS project is a joint European research effort whose goal is **to unravel the contribution of the Epstein-Barr virus to the pathogenesis of Multiple Sclerosis.**

Multiple Sclerosis (MS) is the most frequent neuroinflammatory disease that is typically diagnosed in young adults, most frequently females. Despite new treatments that slow the progression of the disease, patients with MS frequently evolve towards major disability and neurodegeneration.

The pathogenesis of MS is controversially debated and remains globally enshrouded in mystery, but the recent discovery that infection with the Epstein-Barr virus (EBV) is a major risk factor for MS development will radically change research avenues in the field.

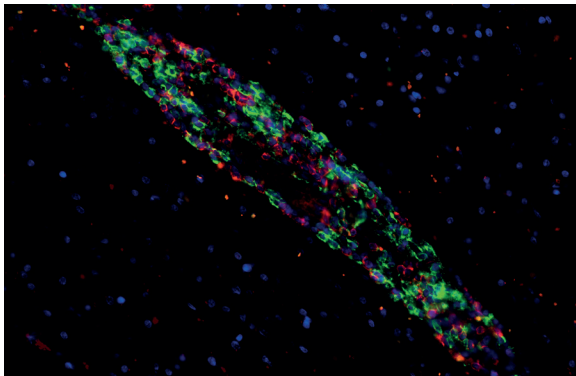
**The project started 1st of December 2023 with a duration of 5 years.**

## What will the BEHIND-MS consortium do?



The Epstein-Barr virus  
Credit: German Cancer Research Center (DKFZ)

### B and CD4T lymphocytes in a perivascular immune infiltrate in MS white matter lesion



Double immunofluorescence staining for CD20 (green) and CD4 (red) shows B and CD4T lymphocytes in a perivascular immune infiltrate in an active white matter lesion of a donor with secondary progressive MS.  
Credit: Barbara Serafini PhD – Istituto Superiore di Sanità, Rome Italy

The BEHIND-MS consortium proposes to draw for the first time **a comprehensive atlas** of the interactions between the virus itself, EBV-infected B cells, and all arms of the adaptive immune system and **how they ultimately lead to demyelination and neural damage**, in the context of genetic risk factors.

One essential aspect of our project is to apprehend **the various mechanisms** that lead to the different clinical and biological forms of the disease, with the ultimate goal of developing a personalized approach to the therapy of every patient.

We will combine **artificial intelligence-based algorithms** with experimental approaches to determine the nature, intensity and breadth of the immune reaction against the virus in patients with MS and how this leads to the development of neurological lesions.

We will also comprehensively **map the viral targets of the immune system** and how these could also induce an autoimmune reaction in MS patients.

## How will BEHIND-MS shape MS care?

The pivotal knowledge regarding the interaction between EBV and MS developed in this project will **empower the entire healthcare value chain** to work towards better clinical management of MS.

A detailed understanding of EBV-MS interactions, combined with newly identified biomarkers, risk factors and study models will **open the doors for researchers, clinicians and industry** to capitalize on the mechanisms underlying EBV-MS interactions, and develop new diagnostic, preventive and therapeutic tools and guidelines.

Throughout the project an **open dialogue** with patients with MS, caregivers, clinicians and other stakeholder representatives will ensure a mutual understanding of needs and project results.

Ultimately, by contributing to improved risk analysis, stratification and treatment strategies BEHIND-MS has the **ambition of improving clinical outcomes** and reduce the burden of MS on society.