MS clone tracking : TRACKING TCELL CLONES FROM THEPERIPHERY TO THE CENTRAL NERVOUS SYSTEM IN MULTIPLE SCLEROSIS

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Multiple sclerosis (MS) is an inflammatory and demyelinating disease of the central nervous system (CNS) where T and B cells play a key role. T cells found in lesions in the central nervous system come from the periphery where they are thought to be primed for recognizing a (self) antigen and then pass through the blood-brain barrier. As of yet, only a limited knowledge of the phenotype of invading T and B cells has been achieved, because access to the CNS of patients is rare and difficult. The comparison of clonally expanded T cells found in MS lesions and in other organs (including cerebro-spinal fluid (CSF), blood, spleen, gut or others) has never been achieved to date.

The main objective of this project is to highlight the comprehensive phenotype of the T and B cell clones invading the CNS of patients with MS in comparison to the same clones found in other tissues (CSF, blood, gut, spleen and abdominal fat) and to the non-expanding clones found in lesions. The project will highlight the fate of the cell clones from the periphery to the CNS in MS.

The project will be based on already obtained fresh immune cells from CNS lesions, CSF, blood, gut and other tissues at the time of death of two patients. We will perform 5' single-cell RNA sequencing analysis to obtain, at the single cell level, the phenotype of the cells and the sequence of their TCR and BCR. We will then attribute to each clone from each organ the phenotype of each cell. We will thus be able to compare the clonotypes present in different organs by merging these sets of information.

A large phenotypic characterization of T and B cells invading the CNS in patients of MS is warranted to better understand their mechanisms of action and their infiltration in the CNS, allowing to deepen the knowledge on the mechanisms underlying the disease.