

The unexplored role of interleukin-24 in multiple sclerosis (ongoing – unpublished).

Broux, B., Peter, Ch., Bourbonnière, L., Duquette, P., Korn, Th., Stinissen, P., Prat, A., Hellings, N.

Hasselt University, Biomedical Research Institute, Diepenbeek, Belgium; Technische Universität München, Department of Neurology, Klinikum rechts der Isar, München, Germany; Centre de Recherche du Centre Hospitalier de l'Université de Montréal (CRCHUM), Neuroimmunology unit, Montréal, Canada.

Research question and background

It is well established that TH1 and TH17 lymphocytes, as well as the cytokines they produce, are crucial in the pathogenesis of multiple sclerosis (MS). In this study, we evaluate the unexplored role of IL-24 in the pathogenesis of MS.

Methods and tissues used

Using qPCR and ELISA, we will determine the expression of IL-24 on different immune cell subsets of MS patients and healthy donors, as well as in serum and CSF. We will identify IL-24 expression in the CNS of 4 MS patients and 4 non-demented controls using immunohistochemistry. In vitro assays will be performed to evaluate the effect of IL-24 on immune cell phenotype and blood brain barrier permeability and function.

Results and conclusion

Preliminary results reveal that both IL-24 mRNA and protein are predominantly expressed by TH1 cells, but also by TH17 cells, of both healthy donors and MS patients. Furthermore, we detected IL-24 in serum, but not in CSF, of both healthy donors and MS patients. In our cohort of patients, immunomodulatory treatment reduced the concentration of IL-24 in the serum of these patients. In active MS lesions, we did not find IL-24 expressing TH lymphocytes by immunohistofluorescence and confocal microscopy. However, reactive astrocytes within these lesions highly expressed IL-24, compared to normal appearing white matter. Indeed, when we inflamed astrocytes in vitro, they upregulated the expression of IL-24. Finally, we found that recombinant human IL-24 decreased transendothelial electrical resistance (TEER) of blood brain barrier endothelial cells (BBB-ECs), as measured using the ECIS system. These results suggest a functional mechanism of astrocyte-induced breakdown of the BBB through IL-24 in an inflammatory environment such as MS.