Multiple Sclerosis (MS) is a demyelinating disease of the CNS, whose pathophysiology involves both inflammatory and neurodegenerative components. CD4+ T cells are one of the key mediators of disease initiation and progression; however CD4 i s also the receptor for the pro-inflammatory cytokine, interleukin - 16 (IL - 16). IL - 16 has been proposed to play a role in several autoimmune diseases, but the exact role of IL - 16 in the CNS during MS initiation and progression remains unclear. Therefore, the aim of this study was to examine the expression and distribution of IL - 16 in CNS tissue and investigate whether expression levels correlate with neuro-inflammation in experimental autoimmune encephalomyelitis (EAE), a murine model of MS.

EAE was induced in 6 week old C 57BL/6J female mice by immunisation with MOG35 - 55 peptide and adjuvants. Tissue was harvested at onset (day 11), peak (day 16) and resolution (day 26), and immunofluorescence staining carried out to determine CD45, CD4 and IL - 16 expression and localisation in the brain of both control and EAE mice. In addition, co-localisation of IL - 16 with CNS and immune cell subtypes was performed using a Mesolens microscope (McConnell et al., 2016), which allows subcellular detail to be obtained from wide - field epifluorescence images.

Expression of IL - 16 and CD4 was observed primarily within the lesions of cerebellum and hippocampus of the EAE brain, whereas little expression was observed in control brains. IL - 16 expression was highest at onset with 76 ±2.8% of cells (n=3) within these lesions expressing IL - 16. This was reduced to 48±2.4% (n=3) at peak and 16 ±1.3% at resolution (n=3). Co-localization studies revealed that IL - 16 was expressed primarily by infiltrating immune cells but not by neurons or astrocytes. Co-localization of IL - 16 with immune cells in brain lesions of EAE mice suggests that infiltrating immune cells are the primary source of IL - 16. Further investigation is required if IL - 16 is pro-inflammatory or anti-inflammatory in the CNS during EAE.

References:

McConnell G et al., (2016). A novel optical microscope for imaging large embryos and tissue volumes with sub-cellular resolution throughout. E-life. http://dx.doi.org/10.7554/eLife.18659.001