



Novel therapeutic target in multiple sclerosis: brain tissue and cellular specificities in demyelinated lesions designate human endogenous retrovirus-W envelope protein

Jack van Horssen, Philip Nijland, Susanne van der Pol, Sandra Amor, Annabelle Drouillard, Hei-Lanne Reynaud, François Curtin, Patrice Marche, Hervé Jean-François Perron

More than 20 years ago, the first reports were published on the presence of retrovirus-like particles with reverse-transcriptase activity in leptomenigeal and macrophage cell cultures from patients with MS.

The objective of the current study was to evaluate HERV-W Env and GAG protein distribution and cellular localization in different stages of MS lesion development using a large cohort of well-characterized MS samples. We here demonstrate that HERV-W Env and GAG proteins are abundantly present in demyelinated areas with ongoing inflammation. Particularly infiltrated macrophages, as well as activated microglia, were markedly decorated with antibodies directed against HERV-W Env and GAG protein. Additionally, we observed moderate HERV-W Env/GAG-immunopositive reactive astrocytes throughout active and chronic active lesions. In chronic inactive lesions we observed some HERV-W Env-immunoreactive astrocytes. Taken together, our extensive immunohistochemical survey reveals that both HERV-W Env and HERV-W GAG protein expression is markedly upregulated in inflammatory MS lesions.