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labormedizinisches zentrum Dr Risch, Liechtenstein

Multiple sclerosis and age-related macular degeneration: examples of pathogenic viral interaction with the immune system?

A hypothesis is formulated on viral interaction between HHV-6A and EBV as a pathogenic mechanism in Multiple Sclerosis (MS). Evidence of molecular and genetic mechanisms suggests a link between HHV-6A infection and EBV activation in the brain of MS patients leading to intrathecal B-cell transformation. Consequent T-cell immune response against the EBV-infected cells is postulated as a pathogenic basis for inflammatory lesion formation in the brain of susceptible individuals. A more subtle pathogenic mechanism can be seen in the down-regulation of CD46 on astrocytes by the infecting HHV-6A. Since CD46 is central in regulating the complement system, a lack of CD46 leads to hyper-activation of the complement system. In fact, activation of the complement system in brain lesions is one of the pathogenic mechanism in MS. A similar mechanism is suspected to be central in the development of age-related macular degeneration (AMD). One of the earliest changes in the retina of AMD patients is the loss of CD46 expression in the retinal pigment epithelium (RPE) during geographic atrophy. Furthermore, CD46 deficient mice spontaneously develop dry-type AMD-like changes in their retina. It is also well known that certain genetic polymorphisms in the complement-inhibiting pathways correlate with higher risks of AMD development. The hypothesis here is that HHV-6A infection of the retina leads to down-regulation of CD46 and consequently to hyper-activation of the complement system in the eyes of susceptible individuals as a pathogenic mechanism. Interaction of HHV-6A with CD46 also plays a role in triggering autophagy providing a further link to AMD.

Biography

Walter Fierz is a Clinical Immunologist with basic training in experimental cellular immunology at the Transplantation Immunology Unit of the Clinical Research Center in Harrow, London (UK) and at the Max-Planck-Society group for Multiple Sclerosis research in Würzburg (Germany). Later work involved running of a Diagnostic Cellular Immunology Laboratory at the University of Zürich (Switzerland) and further as Medical Director at private laboratories. He also achieved a Master of Health Information Management (MHIM) at the Erasmus University in Rotterdam (The Netherlands). For some years, he was Member of the Scientific Advisory Group of the Swiss Society of Multiple Sclerosis.

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