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# **The influence and impact of ageing and immunosenescence (ISC) on adaptive immunity during multiple sclerosis (MS) and the animal counterpart experimental autoimmune encephalomyelitis (EAE).**

**Running title:** Immunosenescence during MS and EAE

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## **Highlights**

- The pathogenesis of multiple sclerosis and the animal counterpart experimental autoimmune encephalomyelitis are directly modulated by chronological and biological ageing.
- Premature upregulation of immunosenescence-related biomarkers in young and adult MS patients implies an important but under-appreciated disease mechanism.
- Modulation of immunosenescence may provide future therapeutic opportunities for neuroinflammatory disease.

## **Abstract:**

The human ageing process encompasses mechanisms that effect a decline in homeostasis with increased susceptibility to disease and the development of chronic life-threatening illness. Increasing age affects the immune system which undergoes a progressive loss of efficiency, termed immunosenescence (ISC), to impact on quantitative and functional aspects of innate and adaptive immunity. The human demyelinating disease multiple sclerosis (MS) and the corresponding animal model experimental autoimmune encephalomyelitis (EAE) are strongly governed by immunological events that primarily involve the adaptive arm of the immune response. MS and EAE are frequently characterised by a chronic pathology and a protracted disease course which thereby creates the potential for exposure to the inherent, on-going effects and consequences of ISC. Collective evidence is presented to confirm the occurrence of established and unendorsed biological markers of ISC

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