

Lay Summary

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Role of neutrophils in the pathogenesis of neuromyelitis optica

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Neuromyelitis optica (NMO, Devic's disease) is an autoimmune inflammatory disorder of the central nervous system which results in the loss of the conducting sheath of nerve fibres located preferentially in the optic nerve and spinal cord resulting in weakness, paralysis and loss of sensation (including blindness). NMO is related to multiple sclerosis (MS) which tends to affect the brain preferentially. NMO is associated with circulating autoimmune antibodies which bind to a particular molecule (aquaporin-4, AQP4) present on the surface of astrocytes which are diagnostic of NMO. The researcher's team has developed an animal model of NMO by introducing these autoimmune antibodies into mouse brain and have discovered that inflammatory tissue damage is mediated by a particular type of cell called a neutrophil that is a normal constituent of the immune system. A molecule called neutrophil elastase can be detected in tissue using specific staining procedures and is specific for neutrophils and this study aims to test the hypothesis that tissue damage in NMO (but not MS) is mediated by neutrophils in support of data from previous mouse studies.