

Response to immune protein determines pathology of multiple sclerosis

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New research may help reveal why different parts of the brain can come under attack in patients with multiple sclerosis (MS). According to a new study in mice with an MS-like disease, the brain's response to a protein produced by invading T cells dictates whether it's the spinal cord or cerebellum that comes under fire. The study—from researchers at the University of Maryland School of Medicine in Baltimore and Washington University in St. Louis—will be published online on October 13th in the *Journal of Experimental Medicine*.

In most MS patients, the disease primarily affects the spinal cord and the white matter of the brain. But a small percentage of patients develop an atypical form of the disease, which primarily affects the cerebellum—the part of the brain that controls sensory perception and movement. For these patients, the disease tends to progress more rapidly and the prognosis is particularly bleak.

MS ensues when the body's T cells invade the brain and trigger nerve-damaging inflammation, in part by secreting proteins called cytokines. According to the new study, lead by Washington University scientist John Russell, the brain's response to one particular immune protein, called interferon-g (IFN γ), determines which part of the brain the T cells attack. In mice that are oblivious to IFN γ (because they lack its receptor), mice suffer cerebellum and brain stem inflammation, but their spinal cords are spared. When IFN γ receptors were left intact, the reverse occurred.

Exactly how the brain's response to IFN γ directs the T cell attack is not yet known, but the authors suspect that IFN γ triggers a localized production of T cell-attracting proteins in the spinal cord. Translating the details of the "conversation" between T cells and brain cells, suggests Russell, might bring scientists closer to understanding the variable manifestations of human MS.

Source: Rockefeller University

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