

Discovery of immune cells that protect against multiple sclerosis offers hope for new treatment

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In multiple sclerosis, the immune system attacks nerves in the brain and spinal cord, causing movement problems, muscle weakness and loss of vision. Immune cells called dendritic cells, which were previously thought to contribute to the onset and development of multiple sclerosis, actually protect against the disease in a mouse model, according to a study published by Cell Press in the August issue of the journal *Immunity*. These new insights change our fundamental understanding of the origins of multiple sclerosis and could lead to the development of more effective treatments for the disease.

"By transfusing dendritic cells into the blood, it may be possible to reduce autoimmunity," says senior study author Ari Waisman of University Medical Center of Johannes Gutenberg University Mainz. "Beyond multiple sclerosis, I can easily imagine that this approach could be applied to other [autoimmune diseases](#), such as [inflammatory bowel disease](#) and psoriasis."

In an animal model of multiple sclerosis known as experimental autoimmune encephalomyelitis (EAE), [immune cells](#) called [T cells](#) trigger the disease after being activated by other immune cells called antigen-presenting cells (APCs). Dendritic cells are APCs capable of activating T cells, but it was not known whether dendritic cells are the APCs that induce EAE.

In the new study, Waisman and his team used genetic methods to deplete dendritic cells in mice. Unexpectedly, these mice were still susceptible to EAE and developed worse autoimmune responses and disease clinical scores, suggesting that dendritic cells are not required to induce EAE and other APCs stimulate T cells to trigger the disease. The researchers also found that dendritic cells reduce the responsiveness of T cells and lower

susceptibility to EAE by increasing the expression of PD-1 receptors on T cells.

"Removing dendritic cells tips the balance toward T cell-mediated autoimmunity," says study author Nir Yogev of University Medical Center of Johannes Gutenberg University Mainz. "Our findings suggest that dendritic cells keep immunity under check, so transferring dendritic cells to patients with multiple sclerosis could cure defects in T cells and serve as an effective intervention for the disease."

More information: Yogev et al.: "Dendritic Cells Ameliorate Autoimmunity in the CNS by Controlling the Homeostasis of PD-1 Receptor+ Regulatory T Cells."

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