

Unexpected finding opens up new way to stop autoimmune diseases and transplant rejection

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After several years of battling recurring infections, the last thing a patient and her doctors ever expected was that the cause of her problems might actually help millions live longer, more active lives. Now, researchers have high hopes because Edward Goetzl and his colleagues from the University of California and The Ohio State University discovered that the patient made a unique antibody to her own T cells, the cells that mediate much of autoimmunity. Acting on the surface of T cells via a novel mechanism, the antibody reduced the number of T cells in her blood stream: a result that usually requires a host of "immunosuppressive" and possibly toxic drugs.

Their research discovery, published online in The *FASEB Journal*, may lead to entirely new therapies for a wide range of autoimmune disorders, such as colitis, lupus, rheumatoid arthritis, inflammatory bowel disease, and multiple sclerosis, as well as new ways to prevent transplant rejection.

"The possibility that these antibodies can be used to treat diverse autoimmune diseases with minimal risk of infections represents a new horizon for reversing these disabling and often fatal conditions," said Edward Goetzl, a senior researcher involved in the study.

In the research report, Goetzl and colleagues explain how they discovered that the antibodies produced by this patient blocked the

sphingosine 1-phosphate (S1P) receptor on T cells. The S1P receptor is a cell-surface antenna that receives signals telling T cells to leave the lymph nodes and patrol the body. When this antenna was disabled, the T cells failed to leave the lymph nodes (chemotaxis), reducing their numbers in the bloodstream. Taking this discovery one step further, the researchers created more of the patient's antibodies in the laboratory and gave them to mice with colitis (an autoimmune disorder). After receiving the antibodies, symptoms of colitis were reduced.

"This discovery is very good news for people with autoimmune disorders." said Gerald Weissmann, M.D., Editor-in-Chief of *The FASEB Journal* "It also shows that when modern scientists work out exactly what is wrong with one patient they can come up with unexpected new ways to treat many thousands.

Source: Federation of American Societies for Experimental Biology

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