Novel immune target identified in multiple sclerosis

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(HealthDay) -- About half of a subgroup of patients with multiple sclerosis have autoantibodies to a potassium channel in the brain, according to a study published in the July 12 issue of the *New England Journal of Medicine*.

Researchers have identified an antibody found in the blood of about half of patients with multiple sclerosis that is not found in people without the autoimmune disease.

The implications of the antibody's presence aren't fully understood. But in rodents, the antibody binds to and damages brain cells that are known to be important to neurological function, according to the study.

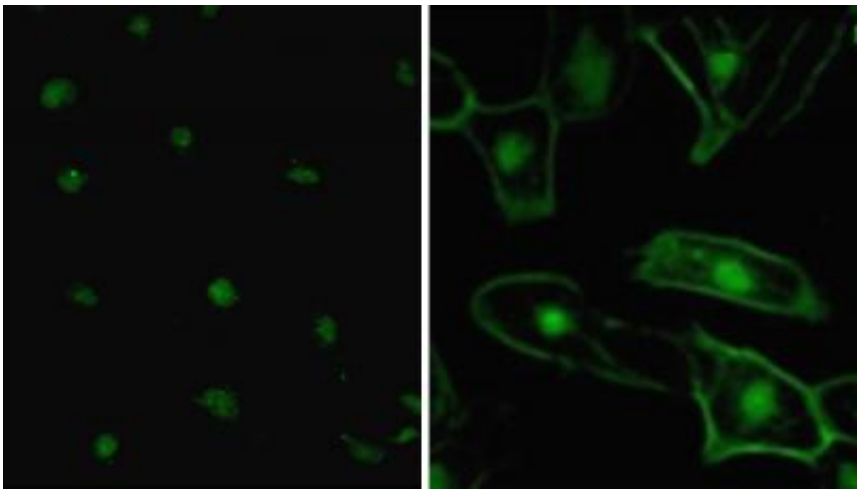
Although the research is preliminary, experts say the findings may open the door for a blood test that could more easily diagnosis multiple sclerosis (MS) patients. The results also suggest a new target for MS treatments that would prevent the antibody from binding to brain cells.

"We have known for a long time that antibodies were involved in the destruction of nervous system tissue in MS, but we have not had a good handle on what the target was for these antibodies," said Timothy Coetzee, chief research officer for the National Multiple Sclerosis Society, who was not involved in the study. "What this research has identified is what might be a potential trigger or target in MS."

The study is published in the July 12 issue of the *New England Journal of Medicine*.

In multiple sclerosis, the body's own immune system attacks myelin, the substance that insulates nerve fibers of the central nervous system. The damage disrupts nerve signals traveling to and from the brain, which can lead to numbness, movement difficulties, blurred vision, fatigue and eventually cognitive problems.

What isn't known, however, is precisely which components of the immune system go awry, which cell proteins the immune system specifically targets and to what extent this varies from patient to patient.



The autoantibody can clearly be seen binding to the membrane of glial cells in the MS serum (right image). By comparison, the image on the left shows a blood sample from a patient with another neurological disease. Credit: KKNMS

In this study, researchers screened the blood serum of two sets of patients with MS and compared it to the serum of people without MS. About 47 percent of the nearly 400 people with MS had high levels of KIR4.1 antibodies, while none of the non-MS control participants did.

In addition, only three of the nearly 330 people with other neurological diseases had high levels of KIR4.1, indicating that the antibody researchers are homing in on is specific to MS and not more general neurological problems.

Researchers then injected KIR4.1 antibodies into the brains of rodents and found the antibody damaged the brain tissue and altered immune response in the region. It should be noted, however, that results found in animals often do not translate to humans.

"If this is truly the target of the immune response, this could pave the way to other therapies for MS," said senior study author Dr. Bernhard

Hemmer, professor of neurology at Technische Universitat in Munich.

Dr. Emmanuelle Waubant, professor of neurology at the University of California, San Francisco, and director of the UCSF Multiple Sclerosis Center, called the results exciting yet preliminary.

Prior research has found "lots of changes in the immune response that we think relates to the disease," she said. But pinpointing specific antibodies has been difficult, with some studies showing relevance but others failing to repeat the finding.

"In this case, researchers had a large number of participants," she said. "Nearly half of them had the antibody, and the protein in the brain identified as a target for this antibody is known to be important for nerve functioning."

"The antibodies are like Velcro. They bind to proteins or antigens in different tissues," she added. "Many antibodies don't bind in the brain, so they are unlikely to have relevance in MS. But this antibody did."

Still, Hemmer said, not everyone with MS had high levels of KIR4.1 antibodies, meaning there are almost certainly other aspects of the immune system involved.

And MS can vary significantly from person to person. Future research should seek to determine if MS patients with the antibodies fare better or more poorly than others, Coetzee said, as well as what other antibodies and elements of the immune system might be involved.

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