MedicalXpress

Neuroscientists show anti-inflammation molecule helps fight MS-like disease

November 11 2007

An immune system messenger molecule that normally helps quiet inflammation could be an effective tool against multiple sclerosis (MS). Neurology researchers led by Abdolmohamad Rostami, M.D., Ph.D., professor and chair of the Department of Neurology at Jefferson Medical College of Thomas Jefferson University and the Jefferson Hospital for Neuroscience in Philadelphia, have found that the protein interkeukin-27 (IL-27) helped block the onset or reverse symptoms in animals with an MS-like disease.

The results suggest that IL-27 may someday be part of a therapy to temper over-active immune responses, which are thought to be at the heart of MS, an autoimmune disease (in which the body attacks its own tissue) affecting the central nervous system. The Jefferson neuroscientists report their findings November 11, 2007 in the journal *Nature Immunology*. The paper first appears in an advance online publication.

In MS, one of the most common neurological diseases affecting young adults, the myelin coating of nerve fibers becomes inflamed and scarred. As a result, “messages” cannot be sent through the nervous system. Dr. Rostami’s team was trying to understand the mechanisms of how immune responses damage the myelin sheath and axons in the brain.

They had previously observed that IL-27, a signaling molecule called a cytokine, could suppress IL-17, another cytokine, and inflammation. They also knew that in other MS models, mice that lacked receptors for

IL-27 developed excessive inflammation.

Dr. Rostami, who is also director of the Neuroimmunology Laboratory in the Department of Neurology at Jefferson Medical College, Denise Fitzgerald, Ph.D., a postdoctoral research fellow in Dr. Rostami's laboratory, and their colleagues used an animal model of MS called experimental autoimmune encephalomyelitis (EAE) for the investigation.

When the scientists gave IL-27 to the experimental mice, it significantly suppressed active disease. They saw similar effects from IL-27 in cultured cells that were transferred into "naïve" animals, which then produced significantly milder disease. At the same time, they also showed that IL-27 enhanced the production of IL-10, a crucial anti-inflammatory cytokine.

"We previously showed that IL-27 could suppress IL-17," he notes. "Here we also show that IL-27 can enhance the production of IL-10. These may both be different and complementary mechanisms by which IL-27 can suppress EAE."

The findings suggest that increasing IL-27 concentrations might raise IL-10 levels, and help quell an over-active immune response. "This is the first time that we have direct evidence that by actively giving IL-27 like a drug, we can suppress EAE in mice."

Dr. Rostami explains that after an MS flare-up, patients recover from the disease, though the reasons are poorly understood. "We think that one of the ways that recovery from a disease flare-up occurs is that part of the immune system is shut off, suppressing the immune response in the brain. IL-27 appears to be crucial in this process," he says.

Source: Thomas Jefferson University