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# Trapping white blood cells proves novel strategy against chronic viral infections

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Seeing disease-fighting white blood cells vanish from the blood usually signals a weakened immune system. But preventing white blood cells' circulation by trapping them in the lymph nodes can help mice get rid of a chronic viral infection, researchers at Yerkes National Primate Research Center and the Emory Vaccine Center have found.

Their findings, published this week in the journal *Nature,* suggest a new strategy for fighting chronic viral infections that could apply to the treatment of human diseases such as hepatitis C and HIV/AIDS.

The team's discoveries grew out of their study of two varieties of a virus that causes meningitis in mice, says senior author John Altman, PhD, associate professor of microbiology and immunology at Yerkes Research Center and Emory University School of Medicine.

The first author of the paper was postdoctoral fellow Mary Premenko-Lanier, PhD, with contributions from Sarah Pruett, PhD, assistant director of the Biomarkers Core Lab at Yerkes Research Center and graduate students Nelson Moseley and Pablo Romagnoli.

Standard black laboratory mice can fight off infection by the Armstrong strain of lymphocytic choriomeningitis virus (LCMV), but are vulnerable to chronic infection by a variant called clone 13.

Altman and his co-workers found that infecting mice with the Armstrong strain sequesters white blood cells in the lymph nodes, while

clone 13 does so less stringently.

"Our hypothesis was that if we could artificially induce conditions like those produced by the Armstrong strain, it would help the immune system clear an infection by clone 13," says Altman.

His team turned to an experimental drug called FTY720, which prevents white blood cells from leaving lymph nodes.

FTY720, also known as fingolimod, desensitizes white blood cells so they can't respond to the chemical messenger sphingosine-1-phosphate (S1P). S1P also influences heart rate and smooth muscle contraction in the airways.

Scientists had previously thought of FTY720 as something that suppresses the immune system, Altman says. While not approved for sale by the FDA, doctors have tested it for the treatment of multiple sclerosis and preventing kidney transplant rejection.

Even if mice have a stable chronic LCMV clone 13 infection, treatment with FTY720 can still improve their immune response against LCMV enough to have them rid it from their systems, the authors found.

FTY720 appears to prevent "exhaustion" in the group of white blood cells called CD8+ T cells, which are responsible for killing off other cells that become infected by LCMV. Usually, the stress of infection kills some CD8+ T cells and leaves others unable to respond to the virus, Altman says.

It is unclear whether FTY720 resuscitates non-responsive T cells or allows new ones to avoid being killed off, he says.

Altman says he and his co-workers are planning to test FTY720's effects

with other viruses.

Source: Emory University