

Arthritis drug might prove effective in fighting the flu, study suggests

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Researchers at the University of Maryland School of Medicine have found that an approved drug for treating rheumatoid arthritis reduces severe illness and death in mice exposed to the Influenza A virus. Their findings suggest that tempering the response of the body's immune system to influenza infection may alleviate some of the more severe symptoms and even reduce mortality from this virus.

The scientists report in the June 1 edition of *The Journal of Immunology*, which is now available online, that mice infected with the [Influenza A](#) virus responded favorably to a drug called Abatacept, which is commonly used to treat people with rheumatoid arthritis. The mice had been given "memory" T-cells, or [white blood cells](#) that have been primed to fight the invading virus as the result of previous exposure to Influenza A.

"We found that treating the mice with Abatacept minimized tissue damage caused by the immune response, but still enabled the body to rid itself of the virus. The mice didn't become as sick, recovered much faster and had much less damage to the lungs, compared to mice that weren't given the drug," says Donna L. Farber, Ph.D., a professor of surgery and microbiology and immunology at the University of Maryland School of Medicine and the study's senior author.

"Moreover, treatment with Abatacept significantly improved survival for mice infected with a lethal dose of influenza virus," Dr. Farber says. "The survival rate for

the treated mice was 80 percent, compared to 50 percent for the mice that weren't treated."

She explains that the drug does not interrupt the immune system's early, rapid attack in the lungs, which helps to kill the virus, but it prevents "memory" T-cells from overreacting, which produces multiple negative effects. "It's this overactive immune response that can make you feel sick - and can also lead to pneumonia," she says.

The study's lead author, John R. Teijaro, a researcher in Dr. Farber's lab, notes that tissue damage caused by this vigorous immune response - often most prevalent in young, healthy people - is thought to be the leading cause of death from pandemic strains of flu, such as the avian flu and the 1918 Spanish flu. It is also thought to be true of the early cases of H1N1 "swine" flu.

Dr. Farber says, "We believe that our findings are very significant because they provide a potential new treatment for infection by the influenza virus - one that would dampen the [immune response](#), yet still preserve its protective effects."

The researchers are now testing Abatacept in mice that have not previously been exposed to the flu virus, trying to determine how well they respond to the drug once they have become very sick. Instead of having "memory" T-cells, these mice have what are known as "naïve" T-cells, which have never been activated by being exposed to influenza previously. Depending on the results, Dr. Farber hopes to one day bring this promising new immunotherapy to the clinic for the benefit of patients.

E. Albert Reece, M.D., Ph.D., M.B.A., vice president for medical affairs, University of Maryland, and dean of the University of Maryland School of Medicine, says, "The results of this

study are very promising. Influenza is a significant public health problem, affecting millions around the world each year. We hope that this study - and Dr. Farber's continuing research - will pave the way for identifying an effective treatment," Dr. Reece says.

Abatacept, which is manufactured by Bristol-Myers Squibb and marketed under the name Orencia, is already approved by the U.S. Food and Drug Administration for treatment of [rheumatoid arthritis](#). The drug is not approved for treating influenza.

The study, funded by the National Institutes of Health and Bristol-Myers Squibb, is available online at <http://www.jimmunol.org/cgi/content/full/182/11/6834>. The [Journal of Immunology](#) is a peer-reviewed publication of the American Association of Immunologists.

There are three types of seasonal influenza, A, B and C, and a number of subtypes of Influenza A, including a new strain of the H1N1 virus, also known as the "swine flu," which has recently emerged and caused illness and a number of deaths this year in Mexico, the United States and other countries around the world.

Vaccination is the most effective way to prevent someone from getting the flu or having a serious case of the disease. An antiviral drug, Tamiflu, can help to prevent the flu virus from spreading within the body if it is taken within 48 hours of the first symptoms.

Dr. Farber points out that an immunotherapy with a drug such as Abatacept would be effective against different strains of the virus because the target of the drug would be the immune system, not the [virus](#) itself. "We're very excited about the potential of developing a new therapy, which possibly could be given to people even after they are very sick," she says.

Source: University of Maryland Medical Center

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