

New 'bouncer' molecule halts rheumatoid arthritis

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Researchers at Northwestern University Feinberg School of Medicine have discovered why the immune cells of people with rheumatoid arthritis become hyperactive and attack the joints and bones. The immune cells have lost their bouncer, the burly protein that keeps them in line the same way a bouncer in a nightclub controls rowdy patrons.

The Feinberg School team has identified this bouncer, a protein called [P21](#), which prevents immune cells from launching into their destructive rampage through the [cartilage](#) and bone. When the scientists developed and injected an imitation of the protein into an [animal model](#) of rheumatoid arthritis, the disease process was halted.

"The bouncer molecule stopped the immune cells from going crazy," said lead author Harris Perlman, associate professor of [rheumatology](#) at Northwestern's Feinberg School. "Imagine destructive customers in a bar, and the bouncer says, 'You are going to behave!' That's P21. This discovery opens up a new avenue for future therapies, which are greatly needed for rheumatoid arthritis."

Previous research by the Feinberg team showed people with rheumatoid arthritis were low in P21, but the protein's role was unknown. The new study, which will be published in the journal *Arthritis & Rheumatism*, reveals the protein's vital role in keeping the immune cells in check.

Currently, there is no effective, nontoxic way to stop the hyperactive immune cells, Perlman said.

To develop the new approach, Perlman and his team tested five different parts, called peptides, of P21. He slipped each peptide into a "ghostlike" molecule that he injected into mice with a rheumatoid arthritis-like disease. The molecule secretly infiltrated the immune cells. After the seven-day trial, one of the tested peptides had calmed the overactive immune cells without toxic effects. Next, Perlman plans a 30-day study with the same peptide to monitor efficacy and toxicity over a longer period of time.

Existing treatments for [rheumatoid arthritis](#) include low-level chemotherapy and steroids. These are not always effective, however, and they are frequently accompanied by side effects. A newer class of therapy, which is sometimes used in combination with chemotherapy and steroids, is biologic response modifiers. These are antibodies or other proteins that reduce the inflammation produced by the hyperactive [immune cells](#). These biologics don't work for everyone, though, and can be associated with side effects including the risk of infection.

Provided by Northwestern University

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