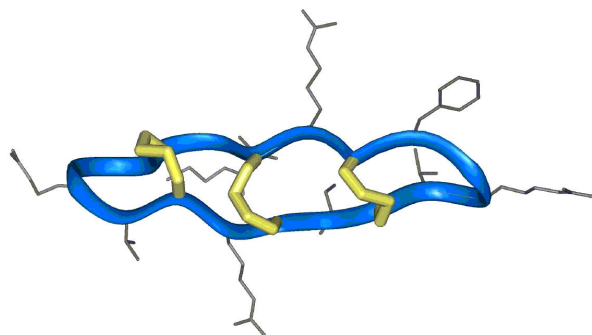


Old World monkeys could be key to a new, powerful rheumatoid arthritis therapy

16 November 2017



RTD-1 ribbon model. Credit: Keck School of Medicine of USC

In the quest for a new and more effective treatment for rheumatoid arthritis, researchers from the Keck School of Medicine of USC looked to a primate that mostly roams the land in Asia, the Middle East and Africa. It was a particular peptide only found in Old World monkeys, called α -defensin 1 (RTD-1), that the researchers believed had the potential to stop—or even reverse—the progression of rheumatoid arthritis, an autoimmune disease that affects about 1.5 million people in the United States. The promising results of their study were published today in *PLOS ONE*.

"RTD-1 is the prototype of a family of small cyclic peptides (α -defensins), the only circular proteins in the animal kingdom," says study author Michael Selsted, MD, PhD, chair and professor of pathology at the Keck School. "Previous studies have shown that RTD-1 modulates lethal inflammation in animal models of infection, and we predicted that RTD-1's protective mechanism in those models would translate to rheumatoid arthritis, a [disease](#) in which chronic inflammation produces irreversible joint damage."

To test their hypothesis, the researchers administered RTD-1 to rats with arthritis for 11 days and observed whether the treatment had any anti-arthritic effects. Within 24 hours of the first administered dose, RTD-1 had significantly reduced arthritis progression. At the end of the treatment, rats that received RTD-1 also had markedly lower arthritis severity scores as compared with rats that had not received RTD-1.

Next, RTD-1 was tested in rats with severe arthritis. The research team found that RTD-1 produced a rapid reduction in arthritis severity within 48 hours of treatment, with complete resolution of clinical disease in all treated rats by day 15.

RTD-1 was then compared to two gold standard treatments for rheumatoid arthritis—methotrexate and etanercept—in [rats](#) with severe arthritis. The team found that RTD-1 treatment resulted in greater disease resolution than methotrexate or etanercept. RTD-1 also achieved the highest rate of complete disease resolution of the three treatments.

"Since most available rheumatoid [arthritis](#) therapies achieve mild to moderate improvements, and disease remission is rare, there's a continuing search for new therapeutics," Selsted says. "Our findings strongly suggest that RTD-1 has potential as a completely new agent for treating [rheumatoid arthritis](#). RTD-1-like molecules may also be effective in the [treatment](#) of other inflammatory diseases and cancer."

More information: *PLOS ONE* (2017). journals.plos.org/plosone/article?id=10.1371/journal.pone.0187868

Provided by University of Southern California

APA citation: Old World monkeys could be key to a new, powerful rheumatoid arthritis therapy (2017, November 16) retrieved 2 May 2021 from <https://medicalxpress.com/news/2017-11-world-monkeys-key-powerful-rheumatoid.html>

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