Team publishes findings about compound with potential for treating rheumatoid arthritis

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This is a hand afflicted by rheumatoid arthritis. Credit: The University of Manchester

Montana State University researchers and their collaborators have published their findings about a chemical compound that shows potential for treating rheumatoid arthritis.

The paper ran in the June issue of the *Journal of Pharmacology and*

Experimental Therapeutics (*JPET*), and one of its illustrations is featured on the cover. *JPET* is a leading scientific journal that covers all aspects of pharmacology, a field that investigates the effects of drugs on biological systems and vice versa.

"This journal is one of the top journals that reports new types of therapeutics that are being developed," said Mark Quinn, senior author on the paper and a professor in MSU's Department of Microbiology and Immunology. The department is part of the College of Agriculture and the College of Letters and Science.

Rheumatoid arthritis is a chronic autoimmune disorder that affects an estimated 1.3 million people in the world, Quinn said. Characterized by stiff, swollen joints, it's a progressive disease that occurs when the body's immune system attacks its own cells. Inflammation in the lining of the joints leads to loss of bone and cartilage. People who have rheumatoid arthritis lose mobility and joint function without adequate treatment.

New kinds of drugs have been developed for treating the disease, Quinn said. Called biological drugs, or "biologics," they are made from genetically engineered proteins or antibodies that act on substances in the immune system. When used to treat rheumatoid arthritis, they interrupt signals that fuel the inflammatory process. Two such drugs are ENBREL and HUMIRA.

Biologics can be expensive, however, and some people don't respond to them, Quinn said. Some people respond at first, but not forever.

"There is a real need to develop new kinds of drugs that are different," Quinn said. "They could be combined with other available drugs or replace drugs that aren't working for patients."

Researchers in his laboratory and elsewhere identified a new chemical

compound, called IQ-1S, in a previous study, Quinn said. Then they conducted a new study to understand how the small-molecule compound works against rheumatoid arthritis. They explained their findings in the *JPET* paper.

The paper said IQ-1S significantly reduced the severity of collagen-induced arthritis, which is a model for rheumatoid arthritis, and inhibited the destruction of cartilage and bone. The compound worked because it targeted kinase proteins that send out signals for destructive and inflammatory activities. Since IQ-1S inhibited the kinase activities, it suppressed inflammation in joint tissue and lymph node cells.

Provided by Montana State University