

MicroRNA molecules serve as on/off switches for inflammation

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University of Utah scientists have identified two microRNA molecules that control chronic inflammation, a discovery that one day may help researchers prevent certain fatal or debilitating conditions before they start.

"We're living at a time where the aging population is growing," said Ryan O'Connell, D.Phil., assistant professor of pathology, whose lab made the discovery. "The question is: how can we predict and prevent the onset of disorders that emerge upon growing older?"

The research will be published this Thursday in *Immunity*, a top immunology journal.

After three years of research and building on previous studies, the scientists determined that if a particular microRNA is genetically removed from mice, the animals will develop chronic inflammation spontaneously and die early from subsequent ailments such as cancer or an autoimmune disorder. However, mice that also lack a second type of microRNA don't develop chronic inflammation. So one microRNA prevents the condition while the other promotes it, identifying a key system in the body that modulates this harmful state.

Certain types of immune cells, called T follicular helper cells, are known to promote the production of antibodies that attack our own tissues and contribute to chronic inflammation. O'Connell and colleagues found that the microRNAs at issue are produced by and act to control these

important cell types.

"Now we know which cells in the body we need to get miRNA inhibitors delivered to if we want to reduce [chronic inflammatory conditions](#)," said O'Connell, noting that the next step is human research. One question would be whether patients with chronic inflammation who received an inhibitor of a certain microRNA would see their chronic inflammation indicators decrease, preventing fatal conditions from emerging.

Previous studies have shown that chronic inflammation is linked to the development of certain conditions including diabetes, lupus, arthritis, obesity, cancer, neurodegeneration and cardiovascular disease along with a shortened life span. The challenge is that [chronic inflammation](#) happens at a low level and is typically not detected by doctors. But certain biomarkers such as elevated levels of cytokines or antibodies can indicate the condition.

"Everyone waits until they have bad symptoms to go see the doctor," he said. "However, the goal of medicine is to take a person who is not sick yet and be able to analyze something we can test that can help predict whether they're going to be sick in the future—and take appropriate measures to prevent terrible outcomes."

Provided by University of Utah Health Sciences

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