MedicalXpress

Potential treatment could stop knee and spine osteoarthritis, scientists say

October 4 2018

Scientists at the Krembil Research Institute have developed a novel therapeutic treatment that has the potential to stop knee and spine osteoarthritis in its tracks.

A team led by Principal Investigator Dr. Mohit Kapoor, Arthritis Research Director at UHN, published the results today in *Annals of the Rheumatic Diseases* in a paper titled "microRNA-181a-5p antisense oligonucleotides attenuate osteoarthritis in facet and knee joints."

"This is important because there are currently no drugs or treatments available to patients that can stop osteoarthritis," says Dr. Kapoor, a Krembil Senior Scientist.

Osteoarthritis is the most common form of arthritis. It affects about five million Canadians and is characterized by a breakdown of the protective cartilage found in the body's spine, hand, knee and hip joints.

"Current treatments for osteoarthritis address the symptoms, such as pain, but are unable to stop the progression of the disease," says Dr. Kapoor. "The blocker we've tested is disease modifying. It has the ability to prevent further joint destruction in both knee and spine."

Utilizing a variety of experimental models, including animal models and human tissue samples, the Krembil team zeroed in on a biomarker, or molecule, called microRNA-181a-5p, which is believed to also cause the inflammation, cartilage destruction and collagen depletion.

Using a blocker consisting of Locked Nucleic Acid-Antisense Oligonucleotides (LNA-ASO), the team was able to stop destruction and protect the cartilage.

"The blocker is based on antisense technology. When you inject this blocker into the joints, it blocks the destructive activity caused by microRNA-181-5p and stops cartilage degeneration," said Dr. Akihiro Nakamura, first author of the paper and a post-doctoral research fellow in the Kapoor Lab.

In addition to testing with animal models, the research team applied this approach using cells and tissues from Toronto Western Hospital patients who have knee and/or spine osteoarthritis.

"The technology in osteoarthritis is in its infancy, but the research has now taken a big step forward. If we are able to develop a safe and effective injection for patients, this discovery could be a game changer," said Dr. Raja Rampersaud, an orthopedic spine surgeon and clinician scientist at Toronto Western who collaborated with the Kapoor team.

Next steps for the research team include commencement of safety studies, determining proper dosage and developing a method for injecting the blocker directly into the knee and spine joints.

Provided by University Health Network