Researchers discover Hedgehogs could play a role in treating osteoarthritis

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(PhysOrg.com) -- Researchers at the University of Toronto and the Hospital for Sick Children (SickKids) have found a pharmacological approach to treating the disease. The study is published in the November 15 advance online edition of *Nature Medicine*.

"If used in patients this could be the first example of a treatment to prevent the degeneration of joints," said the study's principal investigator, Benjamin Alman, professor of surgery at the University of Toronto and head of orthopaedic surgery and senior scientist at SickKids. "It would be a true biological approach to attack the pathogenesis of osteoarthritis."

Osteoarthritis, the most common form of arthritis, is a painful and debilitating disease affecting over 200 million people worldwide. It occurs when the cartilage in the joints wear down over time. However, it is not a paediatric condition and SickKids researchers didn't set out to find a solution.

The scientists had actually been investigating the role a family of proteins, called Hedgehog, play in the development of cartilage tumours, when they stumbled upon a unexpected observation. They found that when Hedgehog proteins were activated in mice, the mice developed osteoarthritis.

Hedgehog proteins are known to play an important role in regulating chondrocytes, or cells that make up the joints or growth plates.

Chondrocytes in joints or cartilage are smooth cells that are present for a lifetime. However, chondrocytes in growth plates (cells responsible for making people tall) grow, die off and make bone.

Results of this study indicate that in osteoarthritis, the cartilage joint chondrocytes behave more like growth plate chondrocytes. Patients and mice who had osteoarthritis also had a high level of Hedgehog. They also found if they increased the level of Hedgehog, mice developed osteoarthritis. More importantly, they found when the protein was blocked either genetically or by using a Hedgehog blocking drug, they were able to reduce the amount of arthritis that developed.

"We may have found a very promising approach to blocking the amount of joint damage and slowing down the progression of the disease," said Alman. "It might prevent people from having to get joint replacements. They can lead active lives and reduce the pain and discomfort associated with the disease."

Provided by University of Toronto (news : web)