

Study indicates nanoparticles could help pain-relieving osteoarthritis drugs last longer

October 26 2011

A novel study demonstrates that using nanoparticles to deliver osteoarthritis drugs to the knee joint could help increase the retention of the drug in the knee cavity, and therefore reduce the frequency of injections patients must receive. This research is being presented Oct. 23 – 27 at the 2011 American Association of Pharmaceutical Scientists (AAPS) Annual Meeting and Exposition in Washington, D.C.

Osteoarthritis affects 30 million Americans and is the most common joint disorder. It is projected to affect more than 20 percent of the U.S. population by 2025. Aging, obesity and joint injury can lead to [osteoarthritis](#), which is characterized by progressive erosion of articular cartilage (cartilage that covers the bones). The disease can occur in all joints, most often the knees, hips, hands and spine, and currently there are no pharmacological treatments that halt the disease progression. For large joints, a drug could be injected into the joint to help limit potential side effects, like pain. A significant challenge in treating osteoarthritis this way is the short duration the medicine stays in the affected joint after injection.

Lead researcher Michael Morgen, Ph.D., and his colleagues from Bend Research and Pfizer propose to address this challenge with injectable [nanoparticles](#) that help retain osteoarthritis drugs in the knee joint. Test results show that 70 percent of the drug nanoparticles remain in the knee [cavity](#) after one week. In contrast, for most current formulations, the drug disperses within one to two days.

In this new process, positively charged nanoparticles carrying a drug attach to the negatively charged, naturally occurring molecules in the knee to form a gel. This gel acts as a depot that slows drug escape from the knee cavity.

"Current delivery methods do not maintain the drug in the [knee](#) for very long, which limits the effectiveness of therapeutic agents," said Dr. Morgen. "We hope that this type of sustained release technology, when used with current or new osteoarthritis drugs, will allow patients to be effectively treated with [drug](#) injections every three months instead of once a week."

Provided by American Association of Pharmaceutical Scientists

Citation: Study indicates nanoparticles could help pain-relieving osteoarthritis drugs last longer (2011, October 26) retrieved 19 April 2024 from <https://medicalxpress.com/news/2011-10-nanoparticles-pain-relieving-osteoarthritis-drugs-longer.html>

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