Scientists develop a single injection that can reverse chronic osteoarthritis in just four weeks

Scientists from the University of Colorado Boulder, CU Anschutz, and Colorado State University have developed two new therapies that, in animal studies, reversed joint damage caused by osteoarthritis within four to eight weeks.

For millions of people living with osteoarthritis, the options have long been bleak: manage the pain or replace the joint. A team of researchers in Colorado is now working to add a third option to that list — and their early results suggest it might actually work.

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The project has now been cleared to advance to its second phase under a federal grant of up to $33.5 million.

What the research involves

The team, led by Stephanie Bryant, professor of chemical and biological engineering at CU Boulder, took two separate approaches to the problem.

The first involves repurposing an existing drug already approved by the US Food and Drug Administration. Bryant and her colleagues developed a patented particle delivery system that carries the drug into the joint via a single injection and releases it in intermittent bursts over several months.

The second is aimed at patients with more significant damage. Here, the team developed a cocktail of engineered proteins that can be injected directly into the joint and cured in place. Once there, it draws the body's own progenitor cells to the site to fill in and repair damaged cartilage or bone.

What they found

When the injection was used to treat animals with arthritic joints, those joints returned to a healthy state within four to eight weeks, according to the team.

In cases where there were holes in bone or cartilage, the researchers reported "full regeneration and repair of the defect."

They also tested the therapies on human cells taken from patients who were undergoing joint replacement surgery and observed what Bryant described as a clear regenerative effect.

"In two years, we were able to go from a moonshot idea to developing these therapies to demonstrating that they reverse osteoarthritis in animals," she said.

Why this matters

Osteoarthritis is the third most common disease in the United States. It affects roughly one in six people over the age of 30 worldwide. The condition causes cartilage, the tissue that keeps bones from grinding against each other, to break down. Over time, it can damage bone as well, reshaping the joint entirely and making everyday movement painful.

At the moment, most patients are left choosing between pain management and surgical joint replacement.

Dr. Evalina Burger, professor and chair of the Department of Orthopedics at CU Anschutz, said she has seen the condition affect people across all ages and activity levels.

"At the moment, the options for many patients are either a massive, expensive surgery or nothing. There's not a lot in between," she said.

What comes next

The project is part of the ARPA-H Novel Innovations for Tissue Regeneration in Osteoarthritis programme, known as NITRO, which was the inaugural programme of the federal Advanced Research Projects Agency for Health.

With the first phase now complete, the Colorado team has advanced to phase two.

The team plans to publish its animal study findings in a peer-reviewed journal later this year. It has also formed a company, Renovare Therapeutics Inc., to work towards making the therapies commercially available.

Bryant said that if upcoming studies go to plan, clinical trials could begin within 18 months.

"Our goal is not just to treat pain and halt progression, but to end this disease," she said.

News Source:

https://pharma.economictimes.indiatimes.com/news/research-and-development/scientists-develop-a-single-injection-that-can-reverse-chronic-osteoarthritis-in-just-four-weeks/132205276