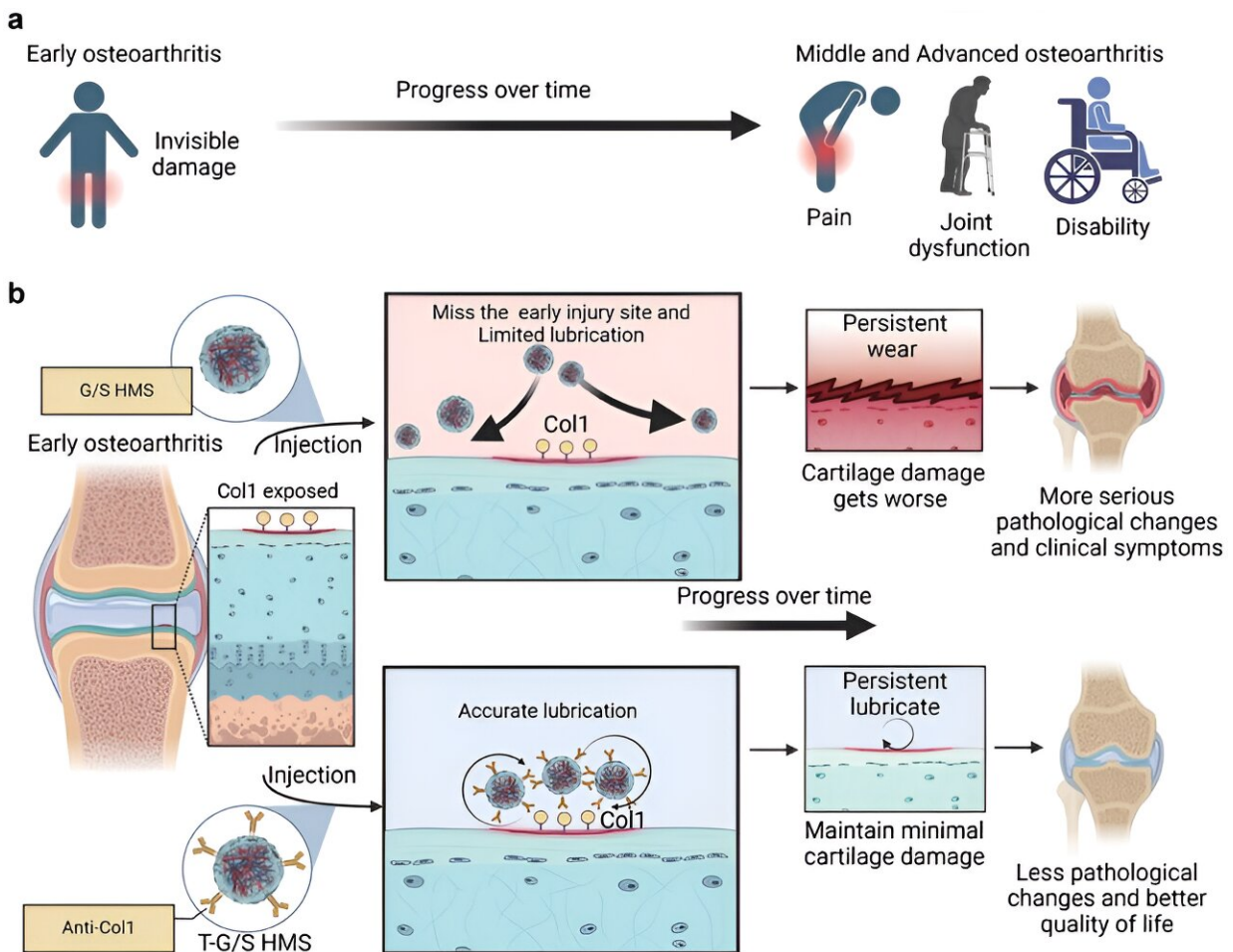


# Hydrogel developed for use in slowing or stopping early stages of osteoarthritis

September 3 2024, by Bob Yirka



Antibody-mediated targeted lubricating hydrogel microspheres. Credit: CAS

A team of material engineers and orthopedic specialists affiliated with

several institutions in China has developed a hydrogel for slowing or stopping the progression of osteoarthritis. Their research is [published](#) in the journal *Advanced Materials*.

Osteoarthritis is a [degenerative joint disease](#)—it presents as a breakdown of the cartilage and the cushion-like tissue within the spaces where joints meet. The result is a reduction in lubrication and an increase in [friction](#), preventing easy movement of the joint, and oftentimes, pain. It is due to multiple factors, such as an autoimmune response or poor exercise habits. The WHO has labeled the disease a global health crisis, affecting more than 528 million people in 2019.

Prior research has led to the development of therapies such as saline or [corticosteroid injections](#), but neither fully reduce friction or pain, and the injections must be repeated every few months. In this new effort, the team in China developed a [hydrogel](#) that, once injected, performs much better than other treatments, according to the researchers.

The researchers made the hydrogel by mixing [hollow spheres](#) with polymer to create a slippery substance—the spheres are a mix of gelatin methacrylate and a poly(sulfobetaine methacrylate). Then, to get the hydrogel to stay in the joint where it is injected, they added a targeted antibody—one that binds to both the microspheres and damaged cartilage.

To test their hydrogel, the research team induced osteoarthritis in rats. They then injected the rats with their hydrogel and put them through exercise routines to measure the impact of the hydrogel on their ability to move normally.

The researchers found that injection of the hydrogel led to an increase in [lubrication](#) coinciding with a reduction in friction and reduced symptoms in rats. They also found that while present in the rat joints, the hydrogel

prevented new joint damage.

The team also found that the hydrogel outperformed traditional therapies—they suggest it offers a promising approach to treating osteoarthritis during its early stages.

**More information:** Xiangming He et al, Precise Lubrication and Protection of Cartilage Damage by Targeting Hydrogel Microsphere, *Advanced Materials* (2024). [DOI: 10.1002/adma.202405943](https://doi.org/10.1002/adma.202405943)

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Citation: Hydrogel developed for use in slowing or stopping early stages of osteoarthritis (2024, September 3) retrieved 5 September 2024 from <https://medicalxpress.com/news/2024-09-hydrogel-early-stages-osteoarthritis.html>

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