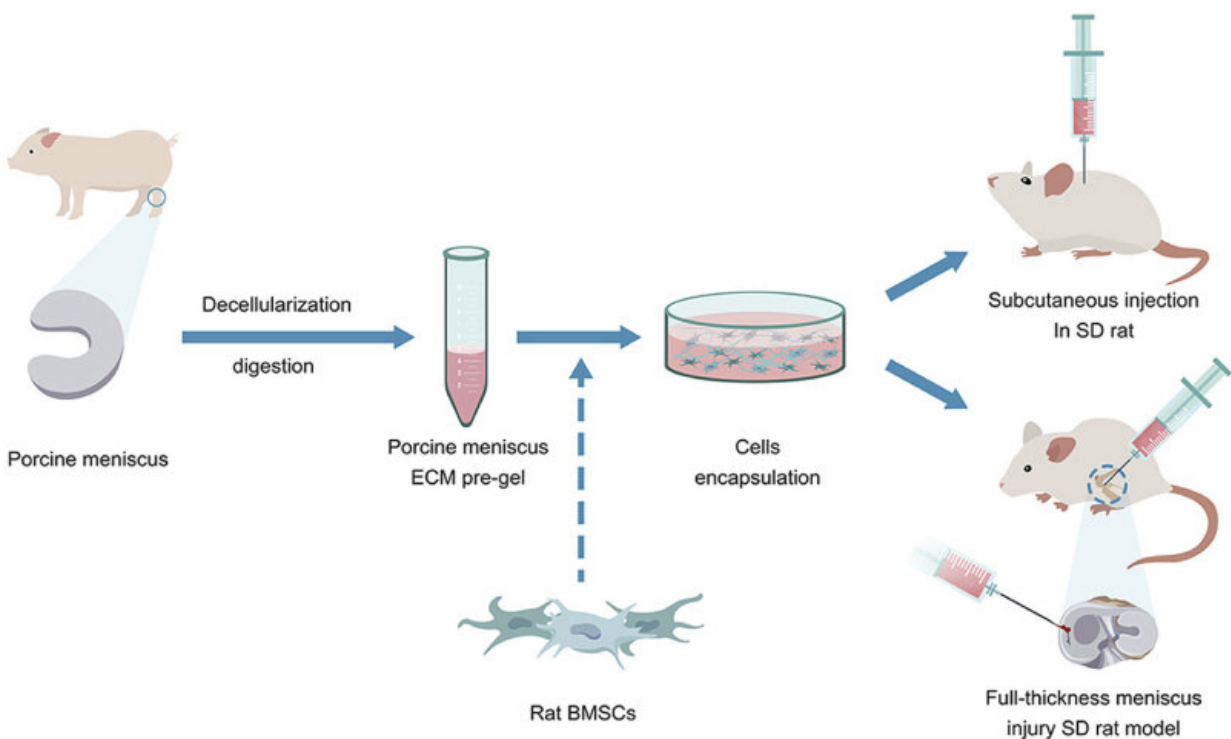


# Researchers develop injectable extracellular-matrix-based biomaterials for meniscus repair

July 7 2020, by Li Yuan



Schematic diagram of injectable ECM hydrogel for delivery of BMSCs. Credit: SIAT

The meniscus is a thin layer of connective tissue in human knees that helps to maintain the stability of joints and conduct mechanical loads.

Meniscus injuries, especially those in the avascular inner zone, have poor healing capability and are associated with the development of osteoarthritis.

Decellularized-[meniscus](#)-derived [extracellular matrix](#) (mECM) hydrogels are promising for promoting injured meniscus tissue remodeling and integrative [repair](#).

Investigations of the long-term efficacy of mECM-hydrogel-loaded MSCs in pertinent animal models for meniscus repair are rare.

Recently, a research team led by Dr. Yu Yin from the Shenzhen Institutes of Advanced Technology (SIAT) of the Chinese Academy of Sciences, in collaboration with the First Affiliated Hospital of Guangxi Medical University, developed an injectable ECM hydrogel for delivery of bone-marrow-derived [stem cells](#) (BMSCs) to repair the full-thickness meniscus defect in an orthotopic rat model.

The study was published in *Bioactive Materials*.

"Our experiment results indicate that decellularized mECM retain essential proteoglycans and collagens, and significantly upregulate expression of fibrochondrogenic markers by BMSCs compared with collagen hydrogel alone in vitro 3-D cell culture," said Dr. Yu.

When the injectable ECM hydrogel was applied to an orthotopic model of meniscal injury in the SD rat model, the histology and micro-CT analysis showed that mECM was superior to the collagen I scaffold in reducing osteophyte formation and prevention of joint space narrowing and osteoarthritis development.

These results indicate that the mECM [hydrogel](#) is a promising carrier to deliver MSCs for long-term repair of meniscus tissue, preventing the

development of osteoarthritis.

**More information:** Gang Zhong et al. Injectable ECM hydrogel for delivery of BMSCs enabled full-thickness meniscus repair in an orthotopic rat model, *Bioactive Materials* (2020). [DOI: 10.1016/j.bioactmat.2020.06.008](https://doi.org/10.1016/j.bioactmat.2020.06.008)

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