

STURGEON CARTILAGE BIOMATERIAL FOR TISSUE REGENERATION

Technology for Licensing

Keywords:

Cartilage, biomaterials, scaffold, tissue engineering, regenerative medicine, sturgeon, extracellular matrix (ECM), cornea, bone.

Description:

Cartilage is a specialized connective tissue that has, among others, a special type of cell called chondrocyte, responsible for synthesizing a dense extracellular matrix (ECM). The most common problems associated with this tissue are age-related degeneration, traumatic injuries, and degenerative and autoimmune diseases.

In recent years, various natural and synthetic biomaterials have been studied for use in cartilage repair. Unfortunately, most of these cannot fully reproduce the microenvironment of native cartilage, which leads to the search for biomaterials suitable for *in vivo* regeneration of this tissue.

To overcome these limitations, the biomaterial developed uses sturgeon cartilage subjected to a mixed decellularization method, developed by the research group.

This biomaterial, which can also be recellularized with human cells, has great potential for regeneration *in vivo*, giving it the ability to be used in the repair of tissue injuries and for the treatment of various diseases.

The *in vivo* and *in vitro* studies carried out confirm the preservation of the fundamental properties of native cartilage, as well as high biocompatibility.

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A new biomaterial for tissue engineering that uses decellularized sturgeon cartilage for the first time. This cartilage, which can later be recellularized, offers biocompatibility and shows great potential *in vivo* for the replacement of tissues that require long-term structural stability, such as the bone, cornea or, especially, cartilage.

Advantages and Benefits

- » Biocompatible tissue
The studies have not detected any local or systemic alteration or another adverse reaction.
- » Low probability of immune rejection
High conservation between species of the structural and functional proteins of the cartilage ECM.
- » Effectiveness in cultivating human cells on its surface
- » Potentially useful for *in vivo* regeneration
The tissue can reproduce the microenvironment of the native cartilage ECM.
- » Ease of molding
The biomaterial can also be presented as lyophilized dust, or diluted and then solidified, allowing easy manipulation to obtain the desired shape.
- » Highly available and versatile raw material

Patent status:

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