

Compositions of Reduced and Reconstituted Microparticles

This advanced treatment method uses native tissues to create custom-molded implants with high porosity for enhanced cell delivery, addressing articular cartilage defects without the risk of long-term tissue degradation.

Tissue decellularization has been shown as a viable means of tissue regeneration in the face of traumatic injury or degenerative diseases. Articular cartilage defects are resilient to natural repair and subject to high mechanical forces, which can lead to further tissue degeneration. Current microparticle systems require hostile exogenous crosslinking, have little control over the final microparticle density, and do not investigate the contribution of separate cartilage components to the chondrogenic induction and maintenance.

Researchers at Purdue University have developed an alternative method of treatment that allows for custom molding of implants, increased porosity between particles for global cell delivery, and relatively small cartilage thicknesses for promoted cell infiltration. This technology uses native tissue and molecules, making it ideal in the application of articular cartilage. Unlike other methods that use synthetic polymer systems or native polymers that can lead to long-term degradation of cartilage, this technology provides dense packing of embedding matrix and cells.

Advantages:

- Eliminates potential for degradation of tissue after surgery

Potential Applications:

- Biomaterials
- Surgical components
- Surgical technology

TRL: 4

Technology ID

2015-NEU-67197

Category

Materials Science &
Nanotechnology/Biomedical &
Bioinspired Materials

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View online



Intellectual Property:

Provisional-Patent, 2015-05-27, United States | Utility Patent, 2016-05-27, United States

Keywords: Tissue decellularization, tissue regeneration, articular cartilage defects, microparticle systems, custom molding of implants, increased porosity, cell delivery, cell infiltration, native tissue, biomaterials