



Biomaterial Scaffolds for the Repair and Regeneration of Intervertebral Discs and Articulating Joints

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WARF: P08447US

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The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing methods for engineering intervertebral disc and/or articulating joint repair scaffolds.

Overview

Biomaterial scaffolds for tissue engineering perform three primary functions. They provide temporary support, provide a connected porosity to enhance tissue regeneration and guide the regenerated tissue into the correct anatomic shape.

Creating biomaterial scaffolds that embody all the requirements is difficult because increasing the connected porosity decreases mechanical stiffness and strength, while decreasing connected porosity compromises cell migration and tissue regeneration. Recent advances in tissue engineering have significantly improved biomaterial scaffolds, but a need for more optimized biomaterial scaffolding in tissue engineering systems remains.

The Invention

Researchers from UW-Madison and elsewhere have developed methods for engineering and preparing scaffolds for repairing intervertebral discs and articulating joints. These scaffolds have internal porous architectures that meet the need for mechanical stiffness and strength as well as connected porosity for cell migration and tissue regeneration.

The methods utilize images prepared with magnetic resonance (MR) or a combination of MR and computed tomography (CT) as a template for creating the scaffolds as well as the fixation for the scaffolding into adjacent tissue or bone. Their advantages include the ability to design microstructures that mimic intervertebral load carrying capability and the potential to provide directed nutrients to migrated cells within the disc. Furthermore, the ability to create structures that can regrow natural tissue could be an improvement upon current artificial discs made of synthetic materials which are subject to greater wear and tear.

Applications

- Design and development of biomaterial scaffolds for use in the repair and regeneration of intervertebral discs and articulating joints

Key Benefits

- Designs scaffolds which mimic natural tissues and structures
- Provides ability to transport nutrients to seeded or migrated cells
- Allows control over scaffold properties

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Additional Information

For More Information About the Inventors

- [William Murphy](#)

Tech Fields

- [Medical Devices : Other medical devices](#)

For current licensing status, please contact Rafael Diaz at rdiaz@warf.org or 608-960-9847

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