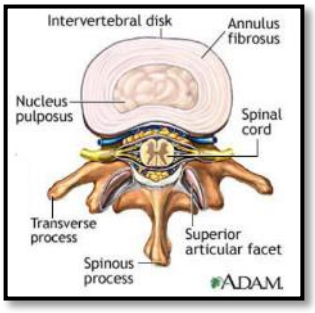
Novel Shape-Memory Biomaterial for Intervertebral Disc Tissue Regeneration

Description:



Spinal disc degeneration is a very common affliction, as an estimated 640,000 individuals are hospitalized annually for Intervertebral Disc (IVD) associated maladies. It leads to pain and discomfort and is treated most commonly by targeting the symptoms versus healing the tissue, or through permanent spinal fusion. Currently, there is a gap in the options to effectively treat mild to moderate disc degeneration.

The hydrogel core of the spinal disc is called the nucleus pulposus (NP) and is often the origin of spinal disc degeneration. Nucleus pulposus replacement is emerging as a promising approach to fill this treatment gap.

Other NP replacement materials and devices are in development; however, they include mechanical devices or synthetic hydrogels and offer to be a permanent synthetic implant to permanently replace the NP. A distinctive Opportunity remains for novel materials to replace degenerating Nucleus Pulposus and regenerate functional tissue.

Introduced here is an emerging technology, developed in the Department of Bioengineering that is a highly elastic novel shape-memory resilient material to replace the NP in form and function. Additionally, it also provides for regeneration of a functional NP through gradual remodeling into healthy NP tissue in vivo. Studies to date demonstrate the potential ability for this material to:

1. Mimic native NP in form and function to alleviate pain
2. Offer Regenerative Solution- Support autologous cell viability and remodeling

Applications:

- Nucleus Pulposus replacement within mild to moderate degenerating Intervertebral disc
- Soft tissue defect filler
- Potentially for use as orthopedic tissue scaffold material other than IVD (i.e. cartilage)

Benefits:

- Material mimics both form and function of native nucleus pulposus
- Moldable to fit custom anatomy based on MRI
- Scalable process
- Utilizes known and accepted biopolymer base materials
- Can be introduced via minimally invasive procedure

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Licensing Status:	Available for licensing
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