


Tissue Engineered Biodiscs

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Summary

Intervertebral disc (IVD) is a specialized structure to anchor adjacent vertebral bodies conferring flexibility and providing mechanical stability during axial compression. Degeneration of IVD results in low back pain and limited mobility. Very recently, to overcome limited success of current surgical treatment focused on fusion, many research groups have started working with tissue engineering technique. It has been recognized that tissue engineering offers an alternative techniques to whole organ and tissue transplantation for diseased, failed or malfunctioned organs. In tissue engineering of IVD, disc cells harvested from IVD tissue of donor, bioactive molecules and proper scaffold are needed. In this chapter, scaffolds like demineralized bone particles (DBP) impregnated PLGA (DBP/PLGA), small intestinal submucosa (SIS) impregnated PLGA (SIS/PLGA), SIS and DBP impregnated PLGA (SIS/DBP/PLGA) and crosslinked SIS sponge, PLGA scaffold and PGA mesh are reviewed for the possibility of the application of the tissue engineered IVD. Cell-sources such as nucleus pulposus and annulus fibrosus cells for primary cell and mesenchymal stem cells for adult stem cells are reviewed. Also, the roles of cytokine for the differentiation of chondrogenesis of mesenchymal stem cell have been investigated.

KEYWORDS: Biodisc, hybrid scaffolds, intervertebral disc(IVD), demineralized bone particles (DBP), small intestinal submucosa (SIS), PLGA

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