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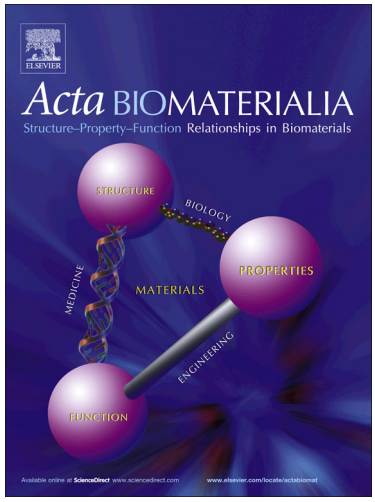

Review article

Lessons to be learned and future directions for intervertebral disc biomaterials

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Lessons to be learned and future directions for intervertebral disc biomaterials

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Abstract

Biomaterials science has achieved significant advancements for the replacement, repair and regeneration of intervertebral disc tissues. However, the translation of this research to the clinic presents hurdles. The goal of this paper is to identify strategies to recapitulate the intrinsic complexities of the intervertebral disc, to highlight the unresolved issues in basic knowledge hindering the clinical translation, and finally to report on the emerging technologies in the biomaterials field. On this basis, we identify promising research directions, with the hope of stimulating further debate and advances for resolving clinical problems such as cervical and low back pain using biomaterial-based approaches.

Keywords: Intervertebral disc regeneration, decellularized matrix, cell homing, 3D printing, double network tough hydrogels.