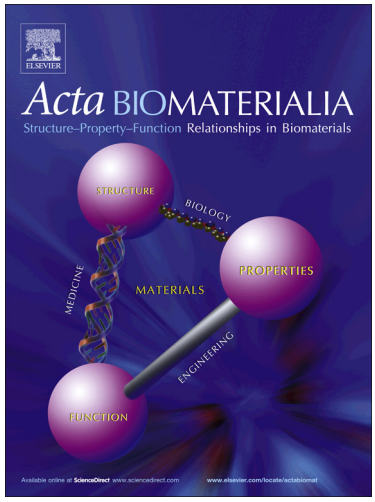

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Functional pig peritoneum-derived acellular matrix combining microfracture for cartilage repair in rabbit models

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Abstract

Due to the avascular and hypocellular nature of cartilage, the repair of articular cartilage defects within synovial joints still poses a significant clinical challenge. To promote neocartilage properties, we established a functional scaffold named APM-E7 by conjugating a bone marrow-derived mesenchymal stem cells (BM-MSCs) affinity peptide (E7) onto the acellular peritoneum matrix (APM). During *in vitro* culture, the APM-E7 scaffold can support better proliferation as well as better differentiation into chondrocytes of BM-MSCs. After implanted into cartilage defects in rabbits for 24 weeks, compared with microfracture and APM groups, the APM-E7 scaffolds exhibited superior quality of neocartilage without transplant rejection, according to general observations, histological assessment, synovial fluid analysis, magnetic resonance imaging (MRI) and nanomechanical properties. This APM-E7 scaffold provided a scaffold for cell attachment, which was crucial for cartilage regeneration. Overall, the APM-E7 is a promising biomaterial with low immunogenicity for one-step cartilage repair by promoting autologous connective tissue progenitors