

## **Beta-defensin-4 (HBD-4) is expressed in chondrocytes derived from normal and osteoarthritic cartilage encapsulated in poly(ethylene glycol) diacrylate (PEGDA) scaffold**

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*Objective.* The aim of this study was to investigate  $\beta$ -defensin-4 expression in chondrocytes from knee articular cartilage of patients with osteoarthritis (OA) compared to normal cartilage, *in vivo*, on paraffin sections, and *in vitro*, on primary chondrocytes culture and after chondrocytes encapsulation in construct hydrogels (PEGDA).

*Design.* Articular cartilage specimens from OA and normal cartilage were assessed by histology (Hematoxylin and Eosin) and histochemistry (Safranin-O). The expression of  $\beta$ -defensin-4 was studied by western blot and immunohistochemical technique applied onto normal and OA chondrocytes encapsulated in hydrogel (PEGDA) and by immunocytochemistry in monolayer from normal and OA chondrocytes.

*Results.* The results showed a strong  $\beta$ -defensin-4 immunoexpression in explanted tissue and in monolayer cells from OA cartilage and a weak  $\beta$ -defensin-4 expression in control cartilage. The chondrocytes from OA cartilage after 4 weeks of culture in hydrogels (PEGDA) shown the formation of new hyaline cartilage and a decreased expression of  $\beta$ -defensin-4 comparable to control cartilage.

*Conclusions.* Our results suggest the possibility of applying autologous cell transplantation in conjunction with scaffold materials for repairing cartilage lesions in patients with OA in order to reduce at least the progression of the disease.

Keywords: Osteoarthritis; knee; chondrocytes;  $\beta$ -defensin-4; hydrogels (PEGDA)