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The horse as a model for translational orthopedic research: examples of studies on the regeneration of cartilage and bone conducted in Costa Rica

El caballo como modelo para la investigación ortopédica traslacional: Ejemplos de estudios sobre la regeneración de cartílago y hueso conducidos en Costa Rica

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Abstract

The paper provides results published or to be published of long-term *in vivo* equine studies to evaluate techniques of possible regenerative matrices of cartilage and bone, by means of cell-free implants or stimulation of the bone marrow. From the fixation techniques analyzed, it can be concluded that the best alternatives are the pressure technique for subchondral defects and a novel hydrogel with self-adhesive capacity for chondral defects.

The equine coxal tuberosity was used for the first time as a model for regeneration studies of bone defects, analyzing scaffolds based on tricalcium phosphate, polymers and nanoparticles, by means of 3-D printing. Osteoconductivity, osteoinductivity, and the importance of microporosity were documented.

Given that decellularized materials do not always give significant desired results in the regeneration of cartilage, it is important to conduct long-term studies. The technique of nanofracture and a novel self-adhesive hydrogel in the knee of the equine showed promising preliminary results in the regeneration of cartilage.

The knee and the coxal tuberosity of the horse represent models of studying cartilage and bone regeneration in a true translational sense as a source of highly valuable information for clinical studies, for both horses and humans.

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