IN VIVO BIOCOMPATIBILITY AND SAFETY ASESSMENT OF A DEXTRIN-BASED HYDROGEL FOR BIOMEDICAL APPLICATIONS

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Hydrogels are three dimensional, crosslinked networks of hydrophilic polymers swollen with a large amount of water or biological fluids. They can be combined with granules of ceramic-based synthetic bone substitutes (SBSs) aiming to stabilize them into bone defects and to obtain injectable formulations. Our research group has been characterizing a fully resorbable and injectable dextrin-based hydrogel (HG) which was intended to perform as a multifunctional platform, enabling the combination with stem cells and other bioactive agents, during clinical procedures [1-3]. In a subcutaneous assay, the HG was able to incorporate and stabilize ceramic granules (250-500 um) in the implant site, demonstrating its potential as an injectable carrier and stabilizer of SBSs [3].

The development of biomaterials for medical applications includes extensive preclinical testing in order to demonstrate their biocompatibility, safety and efficacy. Thus, in this work, the subacute systemic toxicity of the HG was assessed, as well as, the bone histocompatibility and skin sensitization, using rodent models. The obtained results revealed that the HG did not induce any significant systemic toxic effect or skin reaction, neither impaired the bone repair/regeneration process, showing its potential for bone tissue engineering field.

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