Potential of injectable dextrin-based hydrogel for biomedical Applications

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Abstract

Bone tissue engineering is a very challenging and promising field, which handles with the limitations of bone regenerative capacity and the failure of current orthopedic implants [1].

This work describes the preparation and characterization of an injectable dextrin-based hydrogel (oDex) through dextrin oxidation followed by cross-linking with a dihydrazide [2]. In vitro and in vivo experiments allowed to conclude that this system can carry and stabilize cells, nanogels, Bonelike® granules [3] and other biomolecules. This is a promising biomaterial due to its biocompatibility, and potential to promote an adequate environment for bone regeneration, which was increased by the combined bioactive molecules. Its injectability allows a minimal invasive surgical procedure with decreased patient morbidity, lower infection risk and reduced scar formation. Furthermore, an adequate sterilization protocol for this kind of material was established.
The tight collaboration between University of Minho and Bioskin S.A. company, envisioning technology transfer and product valorization, has resulted in a published international patent of the product (WO2011070529A2) [4]. Currently, the submission of a request for the authorization for the clinical trials is being planned.

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