STABILISATION OF BIOSCAFFOLDS FOR APPLICATIONS IN BIOMEDICAL ENGINEERING

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ABSTRACT

Collagen-based scaffolds have been widely used for medical devices in biomedical engineering such as in regenerative tissue medicine, since their main component, collagen, is a native material in the extracellular matrix of tissues. Their extensive use in the surgical and wound treatment domains has solidified their importance as a means for in-situ formation of skin, bone and cartilage tissue[1,2]. We have previously found that the crosslinking of the bioscaffold can affect crucial functional properties in vivo such as stability, degradation rate and mechanical properties. A wide range of crosslinking approaches, each with their own advantages and disadvantages, have been previously studied in order to be able to control the properties of the scaffold. In this work, a new possible stabilization approach for the collagen-based scaffold is studied for the first time and a preliminary optimization of the protocol is also attempted. The produced scaffolds after treatment, are assessed with a range of complementary techniques such as in regards of their mechanical stability and their degradation rate and they are compared with the non treated scaffolds. The preliminary results emphasize the opportunities that arise from this promising approach for biomedical engineering.

KEYWORDS: biomedical engineering, medical devices, gelatin scaffolds, crosslinking, stabilisation, mechanical properties

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