IN VITRO GENOTOXICITY ASSESSMENT 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. Dextrin, a low-molecular-weight carbohydrate composed by glucose residues, has been used to develop a novel fully resorbable and injectable hydrogel for biomedical applications. Dextrin was firstly oxidized (ODEX) to introduce aldehyde groups which then reticulate with adipic acid dihydrazide (ADH), forming the dextrin-based hydrogel (HG) [1]. The cross-linked ODEX is an *in situ* forming hydrogel, which displays a three-dimensional network with inter-connective pores, and is able to incorporate nanogels, cells and biomolecules for biomedical applications [1-3].

Genotoxicity is an important endpoint in the safety assessment of polymeric-based medical devices. ISO 10993-3 (2014) recommends a battery of *in vitro* genotoxicity tests employing eukaryotic and prokaryotic models to determine the potential to induce gene mutations, changes in chromosome structure and number, and other DNA or gene abnormalities caused by the medical devices [4]. Thus, in this study AMES, cytokinesis-block micronucleus (CBMN) and comet assays were used to assess the genotoxic potential of the HG and its isolated components (ODEX and ADH). The results revealed that HG, as well as, ODEX and ADH did not induce significant DNA and chromosomal damage, demonstrating the genocompatibility of the HG for biomedical applications.

Isabel Pereira was supported by the grant SFRH/BD/ 90066/2012 from FCT. We thank FEDER and NORTE 2020 through the project nº 003262 titled "iBONE therapies: advanced solutions for bone regeneration". We also thank the funding from FCT (UID/BIO/044469/2013) and from FEDER through COMPETE 2020 (POCI-01-0145-FEDER-006684).

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