

Preparation of mineralized nanocellulose hydrogel from some local agricultural residues and assessment of their viability for use in osseous regeneration: An *in vitro* study

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Cellulose is a naturally existing polymer, obtained from plants and microorganisms. It is a linear syndiotactic homopolymer composed of D-anhydroglucopyranose units (AGU), which are linked together by β -(1-4)-glucosidic bonds. Cellulose-based hydrogels have many advantages as they are biocompatible, transparent, low cost and non-toxic. Consequently, cellulose-based hydrogels have wide applications in tissue engineering. Nanocellulose, specifically cellulose nanocrystals and nanofibrillated cellulose have gained increasing interest as novel nanomaterial with unique properties, especially hydrogel-like properties could be isolated from different lignocellulosic materials. In bone tissue engineering, addition of bioactive ceramics into biodegradable polymers has several benefits. They increase the osteoconductivity of polymer. Bioactive ceramics can also improve the attachment, differentiation and proliferation of osteoblasts and mesenchymal stem cells (MSCs). Among the bioactive ceramic is biphasic calcium phosphate (BCP). Biphasic calcium phosphate is a mixture of two different calcium phosphate phases: Hydroxyapatite (HA) and tricalcium phosphate (TCP) at different (HA/TCP) ratios. The aim of the present study is to prepare and characterize injectable nanocellulose hydrogel from rice straw wastes and its mineralization with biphasic calcium phosphate for dental bone tissue regeneration. The prepared hydrogel is *in vitro* assessed regarding cytotoxicity and osteoblastic cells' differentiation. This project was supported financially by the Science and Technology Development Fund (STDF), Egypt, Grant No. 5540

Biography

Engie M. Safwat has completed her PhD at the age of 35 years from Dental Biomaterial Department, Faculty of Dentistry, Cairo University. she is a researcher in the National Research Centre, a premier Egyptian research centre. she has published many papers in Egyptian journals and has a Patency no. 26383/ 2010 on 20/9/2010. from the "Academy of Scientific Research and Technology "Egyptian Patent Office, entitled (Preparation and evaluation of zinc phosphate cement powder from Egyptian raw materials).

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