Hassan Gheisari, J Nanomed Nanotechnol 2017, 8:5 (Suppl)
DOI: 10.4172/2157-7439-C1-065

The nanostructure hardystonite/biphasic calcium phosphate scaffolds: Characterization and investigation

Hassan Gheisari
Islamic Azad University, Iran

An important compete in bone tissue engineering is the development of constructs serving as scaffolds to fill bone defects and promote bone regeneration. In this study, highly porous almost (75%) nanostructured hardystonite/biphasic calcium phosphate scaffolds (BCPS) with inter-connected porosity was developed using various hardystonite (HT) contents via space holder technique. Transmission electron microscopy (TEM), X-ray diffraction (XRD) and scanning electron microscopy (SEM) techniques was employed to evaluate different samples. In addition to, the agents of scaffold composition on mechanical behavior, bioactivity and biodegradability was studied. Also, the results showed that the produced scaffolds had an average pore size and density between 250-350 μm and 2.2±0.4-1.7±0.2 gr/cm^3, respectively, depending on the hardystonite (HT) with different contents. Furthermore, increasing the hardystonite content of scaffolds from 0 (control) to 30 wt. % enhanced the bioactivity test, biodegradability and compressive strength from 1.1±0.1 to 3.1±0.2 MPa, respectively. Besides, MTT assay also confirmed that the BCPS30 (containing 30 wt. % of hardystonite) significantly promoted cell viability and cell adhesion compared to BCPS 0. Totally, our project suggests that nanostructured hardystonite/BCPS with improved biological and mechanical behavior (properties) could potentially be used for biomedical engineering such as bone tissue engineering application.

Hassan.gh.d@gmail.com