

Effect of Copper Ions Doped-Hydroxyapatite 3D Fiber Scaffold

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Abstract : The mineral in human bone is not pure stoichiometric calcium phosphate (Ca/P) as it is partially substituted by inorganic elements. In this study, the copper ions (Cu^{2+}) substituted hydroxyapatite (CuHA) powder has been synthesized by the co-precipitation method. The CuHA powder has been used to fabricate CuHA fiber scaffolds by sol-gel process and the following sinter process. The resulted CuHA fibers have slightly different microstructure (i.e. porosity) compared to HA fiber scaffold, which is denser. The mechanical properties test was used to evaluate CuHA, and the results showed decreases in both compression strength and hardness tests. Moreover, the *in vitro* used endothelial cells to evaluate the angiogenesis of CuHA. The result illustrated that the viability of endothelial cell on CuHA fiber scaffold surfaces tends to antigenic behavior. The results obtained with CuHA scaffold give this material benefit in biological applications such as antimicrobial, antitumor, antigens, compacts, filling cavities of the tooth and for the deposition of metal implants anti-tumor, anti-cancer, bone filler, and scaffold.

Keywords : fiber scaffold, copper ions, hydroxyapatite, *in vitro*, mechanical property

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