Preparation of alendronate and BMP-2 loaded calcium phosphate microspheres

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This study describes the preparation and characterization of alendronate and BMP-2 loaded calcium phosphate ceramic microspheres. The formation of calcium phosphate microspheres were initiated by enzymatic decomposition of urea and accomplished by emulsification process(water-in-oil). The microspheres obtained were sintered at 500℃ to remove organic compounds remained which potencially causes toxicity. The microspheres with a mean size range of 290um were in a spherical shape. Scanning electron microscope (SEM) indicated pores on the surface of the microspheres with random size. Energy dispersive X-ray spectroscopy (EDAX) showed that the ratio of calcium to phosphate was more than 1.18 both before and after sintering. X-Ray diffraction (XRD) analysis demonstrated that crystalline hydroxyapatite (HAp) and amorphous CaP phases coexisted within the microspheres. Alendronate and BMP-2 were loaded into the CaP microspheres through the pores. In the releasing profile, both drugs sustainedly released in 1mM PBS buffer. The CaP microspheres loading the drugs did not cause cytotoxicity in cells.