

Development of novel bone substitute biomaterials showing highly osteoconductive property

Novel bone substitute biomaterials should have a property not only to support cellular attachment on the material surfaces but also activate cellular function of osteoblasts that promote regeneration of bone tissue. Our laboratory successfully developed such materials composed of octacalcium phosphate (OCP), obtained by a restricted synthesis condition originally developed, with specific crystal characteristics, and various natural polymers, such as gelatin, collagen and alginate. The materials consist from OCP and these polymers are capable of enhancing replacement with newly formed bone concomitant with their own biodegradations. The concept to develop such materials is that (1) design of reaction of calcium phosphate ceramics and the synthesis; (2) design of material strength to meet the mechanical stress from living body; (3) selection of natural and synthetic polymer materials for the calcium phosphate ceramics. We are prepared to provide academic consultations to companies interested in our research.