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Preparation and fabrication studies of three dimensionally ordered nano-, micro- and meso-scale calcium phosphate crystallites scaffold for artificial bone materials (3-DOMm)

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Preparation and fabrication studies of three dimensionally ordered nano-, micro- and meso-scale calcium phosphate crystallites scaffold for artificial bone materials (3-DOMm): In clinical surgeon for humane bone replacement the artificial bone materials have been developed on a basis of biomechanical capability and nontoxic ability. Since 1987 the calcium phoaphte bone materials have been developed, showing proper mechanical strength, bioability and bone regeneration in bone metabolism. From several years ago global companies such as Stryker, ETEX and Biomet-Merck have commercially introduced the calcium phosphate bone products. The structure of humane bone is known to be the nanocomposites between collagen and hydroxyapatite. Biomimetic bone science have studied for the clinically possible surgical application of calcium phosphate bone. The primary study was how to mimic porous bone scaffold in calcium phosphate/collagen matrix. The second issue was how to attain the mechanical property of real humane bone. In first generation of artificial bone development acrylic polymer such as PMMA was mostly used because of the good mechanical strength in spite of serious toxic problem during surgery. Since calcium phosphate cement [CPC] bone has been introduced as bone regeneration, there was a big problem in clinical application because of low mechanical strength. Polymer modification study into CPC cement has been tried. We have focused on the development of pure calcium phosphate products having proper mechanical strength similar to real humane bone. The bioregeneration ability was shown and new syringe design was introduced for the clinical surgeon. We have been keeping the study of calcium phosphate science and engineering technology in bone metabolic condition. All of phosphate research are based on monodispersed control of nano-, micro-, and meso-scale for the bone scaffold application.

Biography

Myung Chul Chang has completed his PhD at Seoul National University and Postdoctoral studies at University Illinois at Urbana Champaign. He is the Director of Biomaterials Lab. He has published more than 50 papers in reputed journals and has been serving as an Editorial Board Member of reputed journals.

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