

***In Vivo* Response of Porous Hydroxyapatite and β -Tricalcium Phosphate Prepared by Aqueous Solution Combustion Method and Comparison with Bioglass Scaffolds**

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Synopsis - Pure hydroxyapatite (HAp) and a biphasic calcium phosphate [containing 90% of β -Tri Calcium Phosphate (β -TCP) and 10% HAp] were tailored through an aqueous solution combustion synthesis. Porous struts were prepared using all the powders along with bioglass, a known bioactive materials, and subsequently characterized. Sterilized struts were implanted to the lateral side of radius bone of 24 black Bengal goats of either sex, in which a blank hole was left unfilled in a group of six specimens to act as control. The bone formation response of the three implanting materials in vivo has been studied using scanning electron microscope and histological analysis in contrast with positive controls. Push-out tests were used to assess the mechanical strength at the bone-biomaterial interface. It was observed that interfacial response was strongly dependent on combinations of different physical and chemical parameters. The surface of β -TCP exhibited similar characteristics of bone and was distinct from those of intervening apatite layer of bioglass. Lower bone ingrowth and reduced strength was observed with HAp compared to β -TCP/bioglass-based implants. Bone formation response of the Ca-P material varied according to the composition of the implanting materials, which could be tailored through this novel synthesis.

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