

Porous Ceramic Scaffolds for Bone Regeneration

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Abstract

When part of human bone is lost due to an accident or disease, scaffold materials are applied to that defective area for bone regeneration. The scaffold materials should be bioactive and porous for bone in-growth. Calcium phosphate ceramics and bioglass are known to be very bioactive. However, the strengths of these materials are too low to make highly porous bodies. There are two approaches to make a bone scaffold with high bioactivity and high porosity: 1) tailoring the pore configuration of the bioactive materials and 2) making a highly porous body using a strong material, such as partially stabilized zirconia, and coating the struts of the body with a bioactive materials. In the present paper, scaffold materials generated by these two approaches are discussed in terms of strength and biological performance.