

Synthetic Bone Grafts

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BACKGROUND

Bone-mimetic mineral-polymer composite materials have several applications ranging from artificial bone grafts to scaffolds for bone tissue engineering. Current bone graft materials include ceramic powders, combinations of proteins and minerals, autologous bone grafts, allografts and xenografts. The greatest limitation with autografts is donor site morbidity while ceramic powders fail to provide structural support while poorly mimicking the composite structure of bone.

TECHNOLOGY DESCRIPTION

Bioengineers from UC San Diego have developed a hydrogel-based mineralization process to synthesize porous mineralized bone mimetic material. By varying pendant side-chain lengths to control matrix hydrophobicity, the inventors developed a means to regulate the nucleation of aptatite-like phases on a polymeric substrate.

This technology can be used to develop mineral-polymer composite materials for use as scaffolds in bone tissue engineering and as bone grafts, as well as in other applications requiring the templated synthesis of organic/inorganic composite materials.

STATE OF DEVELOPMENT

Results from biocompatibility experiments suggests that the material is highly promising as a bone graft. A patent application has been filed.

Additional detailed information is available under a secrecy agreement.

RELATED MATERIALS

- Phadke A, Zhang C, Hwang Y, Vecchio K, Varghese S. Templated mineralization of synthetic hydrogels for bone-like composite materials: role of matrix hydrophobicity. Biomacromolecules. 2010 Aug 9;11(8):2060-8. - 08/09/2011

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	8,709,452	04/29/2014	2011-007

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OTHER INFORMATION

CATEGORIZED AS

- Medical
- Disease: Musculoskeletal Disorders

RELATED CASES

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