



**Biological and
Agricultural
Engineering
Department**

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Bone Cement with Superior Cell Regeneration

Inventors: Daniel Hayes, John Pojman, Leah Graber, Cong Chen, Kameron V. Kilchrist, Christopher Bounds

Description:

This invention is a novel, biodegradable synthetic bone augment or graft that promotes bone healing in large defects such as those found in trauma or cancer reconstruction. The cement is applied as a liquid, gel, or foam which conformally fills irregular defects, and then quickly polymerizes into a bone-like solid. Pores in the set material provide scaffolding for cell migration from neighboring healthy bone. This colonization is vastly accelerated by placing stem cells, derived from the patient prior to the procedure, in the material. These cells subsequently differentiate into bone cells in response to biochemical cues contained in the polymer. Because the monomer is its own catalyst, concerns about initiator or catalyst leaching from the implant are eliminated.

Advantages:

- Faster regeneration
- Fills defects more securely
- Lower toxicity

Commercial Uses:

- Bone reconstruction

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