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**Licensing
Opportunities**

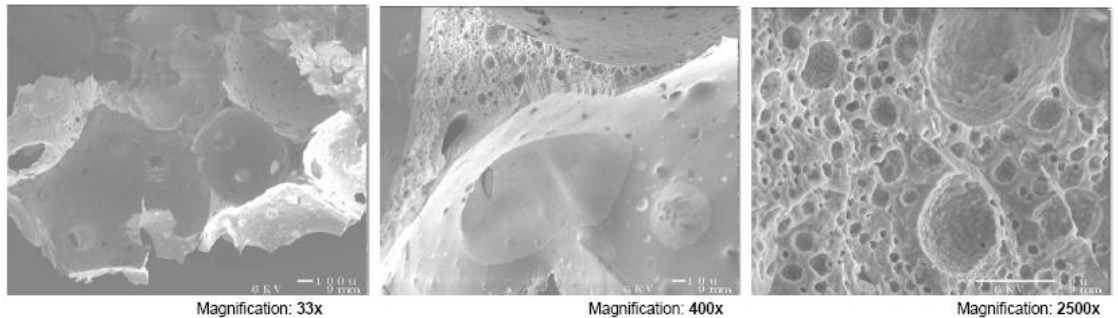
- Exclusive
- Non-exclusive
- Research Sponsorship
- Product Development Partnerships (PDP)

Lehigh Case # 051306-01

*Preparation Method of Nano/Macroporous Bone
Tissue Scaffolds for Regenerative Medicine*

Overview

The present invention provides a method, based on sol-gel processing and polymerization-induced phase separation, for preparing a silica-based bioactive scaffold, in which the pore structure, consisting of interconnected pores of both hundreds of micrometers, and several to tens of nanometers in size, is optimized for enhanced bone regeneration performance. (See figures below) The sol-gel process is a low-cost and versatile method for preparing scaffolds and the phase separation which is induced to occur in the proposed technique results in an interconnected, coral-like, morphology, which leads to structurally stronger materials than the ones achieved by other methods.



Applications and Advantages

This technology involves the harvesting and culture of stem cells from the patient on the scaffold in vitro, thereby creating a tissue/scaffold bio-composite which is then implanted in the damaged site, with tissue regeneration occurring at the rate at which the scaffold reabsorbs. Additionally,

- The macropores in excess of 100 μm are required for bone cell in-growth and proliferation and vascularisation
- The nanopores (range: 5-50 nm) are useful for the rapid crystallization of hydroxycarbonate apatite and cell adhesion.
- Regeneration of diseased or damaged tissue to its original state or function
- The low-cost and versatile sol-gel process allows the control of composition (e.g. Ca/P molar ratio), texture (pore size and shape), homogeneous oxide materials, and scaffold shape control

Status and Intellectual Property

A patent cooperation treaty (PCT) application has been filed.

Lehigh ExpertNet

- **Himanshu Jain** -
<http://expert1.cc.lehigh.edu/LehighExperts/ExpertDetail.aspx?ExpertID=70025964>