Eugene P. Goldberg, J Material Sci Eng 2012, 1:3
http://dx.doi.org/10.4172/2169-0022.S1.001

OMICS Group Conferences
Accelerating Scientific Discovery

International Conference and Expo on
Materials Science & Engineering

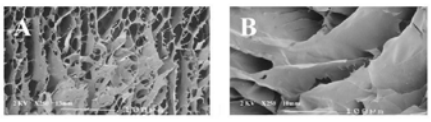
October 22-24, 2012 DoubleTree by Hilton Chicago-North Shore, USA

Eugene P. Goldberg

University of Florida, USA

Microporous biopolymer-microglial cell and implants for spinal cord/CNS repair

There is no clinically effective therapy for repair of spinal cord trauma and other injuries to CNS tissues. More than 250,000 people are affected with 10,000 new injuries annually in the U.S. About 50% are paraplegic or quadriplegic. Annual health care costs exceed $10 billion. Tissue engineering concepts using various cells, polymer scaffolds, and neural tissue growth factors have been problematic for clinical use. Reported here are results for a study encompassing synthesis, characterization, and in vivo evaluation (including high field NMR) of porous biopolymer-neuroregenerative cell implants. Composite compositions containing microglial cells (MGC) in microporous alginate (ALG), and hyaluronic acid (HA), matrices were prepared and some surface modified with a unique radiation grafted phospholipid nanosurface [Figs. A&B]. Because microglia are natural CNS repair cells, the strategy employed in this research was to develop cell-biopolymer structures designed to facilitate the complex sequencing of biosynthesis and regulation of natural neurotrophic factors at the site of injury; thereby enabling the CNS repair processes and regrowth of neural networks. Using a rat spinal cord injury model, effective wound healing and neural regeneration was demonstrated without cystic cavitation. [see EP Goldberg, WJ Streit, JB Stopek patent publication 60/325,190; PCTUS02].



Biography

Goldberg, FAIMBE, FBSE joined the faculty of the University of Florida in 1975 as the Biomedical Program of Excellence Professor in the Department of Materials Science & Engineering and is now the Genzyme Endowment Professor with adjunct affiliations in the Departments of Chemistry, Pharmacology & Therapeutics, and Biomedical Engineering. He was instrumental in establishing intramural graduate programs in Polymer and Biomedical Sciences. He is now also affiliated with the University's Cancer Center. His biomedical research interests and activities for the past 35 years have been diverse with strong focus on Tissue Engineering and Targeted Lung Cancer Therapy. Tissue Engineering has been primarily devoted to new cell-biopolymer compositions for CNS repair based on matrices (porous implants and injectable gels) derived from alginates and hyaluronic acid incorporating viable brain-derived microglial and stem cells. Dr. Goldberg is the senior author of more than 450 published and presented papers and is on the editorial boards of numerous journals.

egold@mse.ufl.edu