



JOHNS HOPKINS

BIOMEDICAL ENGINEERING



Friday, February 6, 2009, 1:00 PM, Clark 110
(Will be teleconferenced to Traylor 709)
Light lunch will be provided at 12:00 in Clark 110



Engineering Functional Human Osteochondral Grafts

Warren L. Grayson, PhD
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Hosted by: Jennifer Elisseff

Abstract: The ability to engineer large, functional bone and cartilage grafts *in vitro* will facilitate the supply of biological grafts with widespread potential for clinical use in joint replacement therapy. I will present studies of anatomically-shaped, human temporomandibular condyle bone grafts seeded with human mesenchymal stem cells (hMSCs) and cultivated long-term in novel perfusion bioreactors. Various imaging modalities were used to demonstrate dense uniform cellular growth and bone formation throughout the entire constructs as a result of medium perfusion. The 3D flow through the construct geometry was modeled to evaluate the correlation between patterns of medium flow and tissue structure. The role of the hMSCs in forming independent cartilage regions or intrinsic micro-vascular tissues (in co-culture with endothelial cells) will also be presented. Altogether, these approaches have enabled us to overcome crucial tissue engineering hurdles, including the cultivation of large grafts with complex geometries *in vitro*, and bring us closer to the realization of providing engineered biological tissue grafts for craniofacial and orthopaedic applications.

Upcoming Seminar:

February 9: Dr. Robert Linhardt

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