



Biomedical
Engineering

FLORIDA INTERNATIONAL UNIVERSITY

Biomedical Engineering
Wallace H. Coulter Foundation
Lecture Series



"Multifunctional Hydroxyapatite Scaffolds for Large Bone Defects"

Dr. Joo L. Ong
Department of Biomedical Engineering,
University of Texas at San Antonio
Friday, February 13th 2015
LECTURE: 9:00AM- 10:00AM

ENGINEERING CENTER
ROOM EC 2300
10555 WEST FLAGLER STREET
MIAMI, FL 33174



Abstract: Open fractures are very common on the battlefield, especially during Operation Iraqi Freedom (OIF) and Operation Enduring Freedom (OEF), with an open fracture reported for every two soldiers injured. Of the 915 fractures were reported during OIF and OEF (October 2001 to January 2005), 758 (82%) were open fractures and a major source of morbidity because they often became infected and/or led to nonunion. In many instances, the use of weapons such as improvised explosive devices (IEDs), vehicle-borne improvised explosive devices (VB-IEDs), car bombs, and suicide bombers have resulted in devastating extremity wounds, which often involve fragmentation of bone. In addition to the problems with the use of autologous and allogeneic grafts for treating defects, these grafts have been used in clinical methodologies/approaches are mostly efficacious for small size defects. Current synthetic grafts, which act as scaffolds for bone regeneration, eliminate the problems of autologous (requiring additional surgery) and of allogeneic (inducing immune reactions) grafts, but are not effective for large bone defects. In our lab, we investigate the use of multifunctional hydroxyapatite scaffolds, with the goal of providing an appropriate architecture for cell infiltration and distribution in a three-dimensional environment as well as having adequate vascularization to provide critically needed oxygen and nutrients to the newly regenerated tissues. The functionality of these scaffolds in large bone defects of small animals will also be presented.

Biography: Joo L. Ong, Ph.D. is currently the USAA Distinguished Professor and Chairman for the Department of Biomedical Engineering at the University of Texas at San Antonio. He is also the Program Director for the Joint Graduate Program in Biomedical Engineering as well as an Adjunct Professor in the Department of Comprehensive Dentistry at the University of Texas Health Science Center at San Antonio. Aside from his current academic appointments, Dr. Ong is also the Associate Editor for the Journal of Biomedical Materials Research, Part B. He received his bachelor's degree from the University of Iowa in 1987, and his M.S. and Ph.D. from the University of Alabama at Birmingham in 1990 and 1994, respectively. Dr. Ong's primary research interests focus the modification and characterization of the implant biomaterials surfaces for dental and orthopedic applications, modification of tissue-engineered ceramic scaffolds, protein-biomaterials interactions, and bone-biomaterials interactions. His work has been funded by the National Institute of Health, National Science Foundation, the Whitaker Foundation, Implant Dentistry Research and Education Foundation, Academy of Prosthodontics, American Association for Dental Research, and US Army, as well as numerous biomedical industries. At present, Dr. Ong authored/co-authored over 130 articles published in refereed journals and over 200 conference abstracts. In addition, he has given invited lectures and keynote lectures at national and international meetings, served as a manuscript reviewer for several biomedical engineering related scientific journals, and continues to serve as a grant reviewer for the National Institutes of Health, National Science Foundations, Department of Defense, and other international funding agencies.

Contact: bmeinfo@fiu.edu; 305-348-6717

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