



## PUBLICATIONS

**L. M. Bonanno** and L.A. DeLouise, Steric Crowding Effects on Target Detection in an Affinity Biosensor, *Langmuir*, 23: 5817 - 5823.

**L. M. Bonanno** and L.A. DeLouise, Whole Blood Optical Biosensor, *Biosensors and Bioelectronics*, 23: 444-448.

**Babak Razavi**, William E. O'Neill, and Gary D. Paige, Auditory Spatial Perception Dynamically Realigns with Changing Eye Position *Journal of Neuroscience* 27: 10249-10258

**L. J. Nagy**, S. MacRae, G. Yoon,, M. Wyble, J. Wang, I. Cox, and K. R. Huxlin, "Photorefractive keratectomy in the cat eye: Biological and optical outcomes," *J. Cataract Refract. Surg.* 33:1051-1064

**Wei Sun**, J. Edward Puzas, Tzong-Jen Sheu, **Xi Liu**, and Philippe M. Fauchet, "Nano- to Microscale Porous Silicon as a Cell Interface for Bone-Tissue Engineering," *Advanced Materials*, 19: 921-924

**P. Wang**, A. DeNunzio, P. Okunieff, W. G. O'Dell, Metastatic Lung Tumor Early Detection Using 3D Template Matching, *Medical Physics*, Volume 34:915-922,

**M. Zhang**, B Castaneda, Z Wu, P Nigwekar, JV Joseph, DJ Rubens, KJ Parker, Congruence of Imaging Estimator and Mechanical Measurements of Viscoelastic Properties of Soft Tissues, *Ultrasound in Medicine and Biology*, 33: 1617-1631,

## Student Headlines

### Dave Reynolds Wins Award For Conference Presentation

PhD Candidate, David Reynolds' paper and poster entitled "Novel Measurement of Bone Graft-to-Host Union Using CT Imaging: Implications for Biomechanical Strength" which he presented at the Tissue Engineering & Regenerative Medicine International Society (TERMIS) meeting in Toronto (June 13-16, 2007) won FIRST prize in the PhD student category. David competed with 250 student applicants and along with the honor of placing First he won a \$1,000 cash prize. David's research aims at developing CT-based methods to accurately predict the strength of bone grafts in a preclinical model. He developed a novel parameter and coined the term 'Union Ratio' as a measure of the integration of the graft bone tissue with the host and callus bone. Using MATLAB™ algorithms developed by David, the Union Ratio can for the very first time be accurately quantified



from the Micro CT scans. David further demonstrated that the Union Ratio significantly improves our ability to predict the experimentally measured bone strength. Currently, David and his co-advisors, Dr. Hani Awad and Dr. Edward Schwartz, are leading efforts to translate these findings to clinical CT methodologies to evaluate therapies for bone grafts in human clinical studies.

### Lisa Bonanno authors two papers on Biosensors

Lisa Bonanno (PhD candidate) and her advisor (Lisa DeLouise) have co-authored two recent papers describing advances in the use of porous silicon-based materials for biomolecule detection. Porous silicon works as a biosensor because ligand binding on the surface of the pores changes the optical response of the material. Lisa's first paper (*Langmuir* 23:5817) demonstrates how antibodies immobilized on the surface of

biosensors create crowding effects that minimize the binding and identification of the target molecule. The paper also proposes surface topologies that can overcome the problem. Her second paper (*Biosensors and Bioelectronics* 23:444) demonstrates how the 3-D pore morphology of porous silicon naturally filters large species from complex mixtures whole blood to enhance the binding of the target molecule.



## **Faculty and Program News**

### **NIH Funds Collaboration on Ultrasound Technologies for Tissue Engineering**

Diane Dalecki and Denise Hocking have received a joint NIH R01 grant in support of their collaboration on the use of ultrasound in tissue engineering. The overall goal of their project is to develop ultrasound-based enabling technologies for the fabrication and monitoring of functional, 3D artificial tissues. Kelly Garvin and Carlos Sevilla - both second year BME graduate students - are key members of the project team.

### **Ed Brown Receives Pew Foundation Fellowship**

Assistant Professor Edward Brown, Ph.D. was one of just 20 scientists in the nation to be named a Pew Scholar in the Biomedical Sciences in 2007. Professor Brown received \$240,000 from the Pew Charitable Trusts in support of his development of light-based imaging of connective tissue in advancing tumors.

### **Hani Awad wins the 2007 Kappa Delta Ann Doner Vaughn Award**

BME Assistant Professor Hani Awad received this Award, along with the research group from his alma mater led by Dr. David Butler. The team was recognized for their research and manuscript on "Functional Tissue Engineering for Tendon Repair: A Multidisciplinary Strategy Using Mesenchymal Stem Cells, Bioscaffolds and Mechanical Stimulation. This is the highest research award given by the American Academy of Orthopaedic Surgeons (AAOS)).

## **STUDENT AWARDS**

### **ANITHA KRISHNAN**

Anitha won a training fellowship from URM's new Clinical and Translational Science Institute (CTSI) for her work modeling brain cancer dispersion using MR diffusion weighted imaging. Anitha was the only UR trainee to win an award.

### **RONEN SUMAGIN**

Ronen received a fellowship from the American Heart Association for his work examining cellular mechanisms of inflammation.

### **ADAM DZIorny AND CANDACE GILDNER**

Adam and Candace were jointly awarded the BME Graduate TA Award for outstanding contributions to BME260.

### **RHIANNON BUSSEY GABORSKI**

Rhiannon received a pre-doctoral fellowship from the NIH Institute on Deafness and Other Communication Disorders. The fellowship will support her work on the molecular signaling

## **MILESTONES**

### **PROPOSAL DEFENSES**

**Tony Chen** "Effects of Fluid Flow-Induced Shear Stress on TNF- $\alpha$  Stimulated Primary Articular Chondrocytes"

**Adam Dziorny** "Can Augmented Acoustic Environments Modify Auditory Processing?"

**Candace Gildner** "Substrate-dependent Regulation of the Structural and Physiological Properties of Extracellular Matrix Fibronectin"

**Xi Liu** "Three Dimensional Orthopaedic Implants with Controllable Drug Delivery Functions Based on Porous Silicon"

### **THESIS DEFENSES**

**Wei Sun, PhD**, Porous Silicon Based Biomaterials for Bone Tissue Engineering

**Peng Wang, PhD** Computer-aided Detection of Lung Nodules in Chest CT and Characterization of Normal Lung Tissue Response Following Pulmonary Stereotactic Radiation Therapy

**Man Zhang, PhD** The Measurement and Imaging of Viscoelastic Properties of Soft Tissues and Lesions,

**Kristen Hovinga, MS** The Effects of Lower Limb Alignment and the Variations of Anatomic and Geometric Factors between Populations in the Normal Healthy Knee Joint.