

**FRIDAY, OCTOBER 8, 2010**

**PLATFORM SESSION - 8-1 - 10:30AM - 12:00PM**

Track: Tissue Engineering \* - 8-1-1

**Cell-Biomaterial Interfaces**

Chairs: Shelly Peyton, Alisha Sieminski

Room 12A

\* Tissue Engineering Track sponsored by Kinetic Concepts, Inc.

- 10:30AM **OP-8-1-1A - Generating Functional T Cells From Stem Cells: Controlling Notch and MHC Signaling in 3D Scaffolds**  
M. Kim<sup>1</sup>, J. Lin<sup>1</sup>, M. Mendoza<sup>1</sup>, and K. Roy<sup>1</sup>  
<sup>1</sup>University of Texas at Austin, Austin, TX
- 10:45AM **OP-8-1-1B - Combinatorial Development of Biomaterials for Stem Cell Engineering**  
Y. Mei<sup>1</sup>, K. Saha<sup>2</sup>, S. R. Bogatyrev<sup>1</sup>, J. Yang<sup>3</sup>, A. L. Hook<sup>3</sup>, Z. I. Kalcioglu<sup>1</sup>, S-W. Cho<sup>1</sup>, M. Mitalipova<sup>2</sup>, N. Pyzocha<sup>2</sup>, F. Rojas<sup>1</sup>, K. J. Van Vliet<sup>1</sup>, M. C. Davies<sup>3</sup>, M. R. Alexander<sup>3</sup>, R. Langer<sup>1</sup>, R. Jaenisch<sup>2</sup>, and D. Anderson<sup>1</sup>  
<sup>1</sup>MIT, Cambridge, MA, <sup>2</sup>Whitehead Institute for Biomedical Research, Cambridge, MA, <sup>3</sup>The University of Nottingham, Nottingham, United Kingdom
- 11:00AM **OP-8-1-1C - Morphological Change of Epithelial Cells Cultured on Substrates with Different Stiffness**  
M. Yamamoto<sup>1</sup>, Y. Murakami<sup>1</sup>, and Y. Tabata<sup>1</sup>  
<sup>1</sup>Institute for Frontier Medical Sciences, Kyoto University, Kyoto, Kyoto, Japan
- 11:15AM **OP-8-1-1D - Quantifying Endothelial Cell-Mediated Deformation of the ECM During Capillary Morphogenesis in 3D**  
E. Kniazeva<sup>1</sup>, M. Digman<sup>1</sup>, E. Gratton<sup>1</sup>, and A. Putnam<sup>2</sup>  
<sup>1</sup>University of California, Irvine, Irvine, CA, <sup>2</sup>University of Michigan, Ann Arbor, MI
- 11:30AM **OP-8-1-1E - Growth Factor Binding is Regulated by Extracellular Matrix Deposition From Human Calvarial Osteoblasts**  
A. Bhat<sup>1</sup>  
<sup>1</sup>University of California-Davis, Woodland, CA
- 11:45AM **OP-8-1-1F - Fibronectin Matrix Conformation Defines Regions of Cell Proliferation and Stress Fiber Formation**  
C. Sevilla<sup>1</sup>, D. Dalecki<sup>1</sup>, and D. Hocking<sup>1</sup>  
<sup>1</sup>University of Rochester, Rochester, NY

Track: Biomedical Imaging and Optics - 8-1-2

**Neuroimaging**

Chairs: Simon Cherry, Kris Ropella

Room 12B

- 10:30AM **OP-8-1-2A - Longitudinal White Matter Changes in Pediatric Traumatic Brain Injury**  
K. Ayoub<sup>1,2</sup>, E. A. Wilde<sup>2</sup>, Z. Chu<sup>2,3</sup>, T. C. Wu<sup>4</sup>, J. V. Hunter<sup>2,3</sup>, A. C. Vasquez<sup>2</sup>, E. D. Bigler<sup>4</sup>, and H. S. Levin<sup>2</sup>  
<sup>1</sup>Rice University, Houston, TX, <sup>2</sup>Baylor College of Medicine, Houston, TX, <sup>3</sup>Texas Children's Hospital, Houston, TX, <sup>4</sup>Brigham Young University, Provo, UT
- 10:45AM **OP-8-1-2B - Microvascular Functional Imaging with FENSI: Flow-Enhanced Signal Intensity**  
C. Ouyang<sup>1</sup>, and B. Sutton<sup>1</sup>  
<sup>1</sup>University of Illinois at Urbana-Champaign, Urbana, IL

- 11:00AM **OP-8-1-2C - New Encoding Schemes for ASL 3D GRASE to Improve Slice Coverage and Reduce Through Plane Blurring**  
H. Tan<sup>1</sup>, W. S. Hoge<sup>2</sup>, and R. A. Kraft<sup>1</sup>  
<sup>1</sup>Virginia Tech - Wake Forest School of Biomedical Engineering and Sciences, Winston-Salem, NC, <sup>2</sup>Brigham and Women's Hospital and Harvard Medical School, Boston, MA
- 11:15AM **OP-8-1-2D - High Spatial Resolution Neurovascular Models for the Analysis of Optical Spectroscopy Data**  
N. R. Cornelius<sup>1</sup>, and P. C. Doerschuk<sup>1</sup>  
<sup>1</sup>Cornell University, Ithaca, NY
- 11:30AM **OP-8-1-2E - A Random Visual Cortex Mapping Technique for Clinical Use**  
Y. Ma<sup>1</sup>, E. DeYoe<sup>2</sup>, and K. Ropella<sup>1</sup>  
<sup>1</sup>Marquette University, Milwaukee, WI, <sup>2</sup>Medical College of Wisconsin, Milwaukee, WI
- 11:45AM **OP-8-1-2F - Quantification of Posture-dependent CSF Distribution Via Analysis of CT, MRI, and Upright MRI**  
F. S. Gayzik<sup>1,2</sup>, D. P. Moreno<sup>1,2</sup>, C. P. Geer<sup>1</sup>, and J. D. Stitzel<sup>1,2</sup>  
<sup>1</sup>Wake Forest University School of Medicine, Winston-Salem, NC, <sup>2</sup>Virginia Tech - Wake Forest Center for Injury Biomechanics, Winston-Salem, NC

Track: Biomedical Imaging and Optics - 8-1-3

### **Imaging in Therapeutics - I**

Chairs: Richard Price, Michaelann Tartis  
Room 19A

- 10:30AM **OP-8-1-3A - Photoacoustic Image-Guided Drug Delivery**  
K. A. Homan<sup>1</sup>, J. Chen<sup>1</sup>, L. Brannon-Peppas<sup>2</sup>, and S. Emelianov<sup>1</sup>  
<sup>1</sup>University of Texas at Austin, Austin, TX, <sup>2</sup>PeppChem Consulting, Austin, TX
- 10:45AM **OP-8-1-3B - Redefining In-Sight: Effective MRI Contrast Agents in Biodegradable Polymeric Drug Delivery Vehicles**  
R. Ragheb<sup>1</sup>, H. Chahboune<sup>1</sup>, J. Criscione<sup>1</sup>, and T. Fahmy<sup>1</sup>  
<sup>1</sup>Yale University, New Haven, CT
- 11:00AM **OP-8-1-3C - A Platform for Enhanced Contrast Ultrasound Targeted Delivery of Therapeutics**  
C. W. Burke<sup>1</sup>, A. L. Kilbanov<sup>1</sup>, J. Sheehan<sup>1</sup>, and R. J. Price<sup>1</sup>  
<sup>1</sup>University of Virginia, Charlottesville, VA
- 11:15AM **OP-8-1-3D - MR-based Pharmacokinetics of the Focused-Ultrasound-induced Blood-Brain Barrier Opening**  
F. Vlachos<sup>1</sup>, Y-S. Tung<sup>2</sup>, and E. Konofagou<sup>2</sup>  
<sup>1</sup>Columbia University, New York, NY, <sup>2</sup>Columbia University, New York, NY
- 11:30AM **OP-8-1-3E - Electromagnetically Tracked Ultrasound for Combined CT+US Therapy in Small Animals**  
C. F. Caskey<sup>1</sup>, M. Hlawitschka<sup>1</sup>, S. Qin<sup>1</sup>, and K. W. Ferrara<sup>1</sup>  
<sup>1</sup>University of California at Davis, Davis, CA
- 11:45AM **OP-8-1-3F - Real-Time Model Assisted MR Temperature Imaging for Monitoring LITT Procedures**  
D. Fuentes<sup>1</sup>, J. Yung<sup>1</sup>, A. Elliott<sup>1</sup>, J. Hazle<sup>1</sup>, and R. J. Stafford<sup>1</sup>  
<sup>1</sup>The University of Texas MD Anderson Cancer Center, Houston, TX

Track: Neural Engineering - 8-1-4

### **Neural Modeling**

Chairs: Christopher Butson, John White  
Room 19B

- 10:30AM **OP-8-1-4A - Rapid, Anatomic Computational Modeling for Design of Clinical Peripheral Nerve Electrodes**  
D. J. Tyler<sup>1</sup>  
<sup>1</sup>Case Western Reserve University, Cleveland, OH

- 10:45AM **OP-8-1-4B - A Dual Resonance Model of Cochlear Tuning**  
D. C. Mountain<sup>1</sup>  
<sup>1</sup>Boston University, Boston, MA
- 11:00AM **OP-8-1-4C - State Dependence of Cortical Optogenetic Perturbations during Active Touch**  
J. T. Ritt<sup>1</sup>, J. H. Siegle<sup>2</sup>, M. Carlen<sup>3</sup>, K. Meletis<sup>3</sup>, L-H. Tsai<sup>2</sup>, and C. I. Moore<sup>2</sup>  
<sup>1</sup>Boston University, Boston, MA, <sup>2</sup>Massachusetts Institute of Technology, Boston, MA, <sup>3</sup>Karolinska Institutet, Stockholm, Sweden
- 11:30AM **OP-8-1-4D - Computational & Evidence Based Methods in Neuromodulation**  
C. R. Butson<sup>1,2</sup>, B. H. Kopell<sup>1</sup>, S. Baillet<sup>1</sup>, W. Gagg<sup>1</sup>, R. R. Ramirez<sup>1</sup>, K. Driesslein<sup>1</sup>, and S. Jain<sup>1</sup>  
<sup>1</sup>Medical College of Wisconsin, Milwaukee, WI, <sup>2</sup>Marquette University, Milwaukee, WI

Track: Cellular and Molecular Engineering - **8-1-5**

### **Cellular Engineering and Modeling**

Chairs: Alexander Spector, Fan Yang

Room 18A

- 10:30AM **OP-8-1-5A - Self-Organization of a Two Cell Muscle Tissue: Theory and Experiment**  
A. Grosberg<sup>1,2</sup>, M. L. McCain<sup>1,2</sup>, and K. K. Parker<sup>1,2</sup>  
<sup>1</sup>Disease Biophysics Group, School of Engineering and Applied Sciences, Harvard University, Cambridge, MA, <sup>2</sup>Wyss Institute for Biologically Inspired Engineering, Harvard University, Boston, MA
- 10:45AM **OP-8-1-5B - Modulation of Ca<sup>2+</sup> Homeostasis and Proteostasis for Lysosomal Storage Disease Therapeutics**  
F. Wang<sup>1</sup>, and L. Segatori<sup>1</sup>  
<sup>1</sup>Rice University, Houston, TX
- 11:00AM **OP-8-1-5C - Frequency Response Detection and Prediction of First-order Spatiotemporal Dynamics in a Xenopus Embryonic Tissue Using Microfluidics**  
Y. Kim<sup>1</sup>, S. D. Joshi<sup>2</sup>, L. A. Davidson<sup>2</sup>, W. C. Messner<sup>1</sup>, and P. R. LeDuc<sup>1</sup>  
<sup>1</sup>Carnegie Mellon University, Pittsburgh, PA, <sup>2</sup>University of Pittsburgh, Pittsburgh, PA
- 11:15AM **OP-8-1-5D - Decision Tree Analysis of Microfluidic Angiogenesis Studies: Determining Cell Fate Transition Probabilities to VEGF/Ang1 Levels**  
A. Das<sup>1</sup>, H. Asada<sup>1</sup>, D. Lauffenburger<sup>1</sup>, and R. Kamm<sup>1</sup>  
<sup>1</sup>MIT, Cambridge, MA
- 11:30AM **OP-8-1-5E - Modeling Biological Membranes as Self-assembled Two-Dimensional Particle Fluids**  
S. Zhang<sup>1</sup>, H. Yuan<sup>1</sup>, C. Huang<sup>1</sup>, and J. Li<sup>2</sup>  
<sup>1</sup>Penn State University, University Park, PA, <sup>2</sup>Univ. Pennsylvania, Philadelphia, PA
- 11:45AM **OP-8-1-5F - The Effects of Nuclear Pre-stress on Passive and Facilitated Nuclear Transport**  
T. Chancellor<sup>1</sup>, and T. Lele<sup>1</sup>  
<sup>1</sup>University of Florida, Gainesville, FL

Track: Cellular and Molecular Engineering - **8-1-6**

### **Cell-Cell Interactions**

Chairs: Lance Kam, Todd Sulchek

Room 18B

- 10:30AM **OP-8-1-6A - JNK-mediated Regulation of Adherens Junctions**  
M. Lee<sup>1</sup>, and S. Andreadis<sup>1</sup>  
<sup>1</sup>SUNY Buffalo, Buffalo, NY
- 10:45AM **OP-8-1-6B - Mechanotransduction at Cell-Cell Junctions**  
D. Leckband<sup>1</sup>, Q. Shi<sup>2</sup>, Q. le Duc<sup>3</sup>, J. de Rooij<sup>3</sup>, and N. Wang<sup>2</sup>  
<sup>1</sup>University of Illinois, Champaign, IL, <sup>2</sup>University of Illinois, Urbana, IL, <sup>3</sup>Hubrecht Institute, Utrecht, Utrecht, Netherlands

- 11:00AM **OP-8-1-6C - Measurement of Adhesion Strengthening in Homophilic Cadherin-Based Cell-Cell Interactions**  
C. C. Esimai<sup>1</sup>, R. Oas<sup>2</sup>, A. P. Kowalczyk<sup>2</sup>, and A. J. Garcia<sup>1</sup>  
<sup>1</sup>Georgia Institute of Technology, Atlanta, GA, <sup>2</sup>Emory University, Atlanta, GA
- 11:15AM **OP-8-1-6D - Multicellular Aggregation Dynamics is Consistent With a Two-step Transport-reaction Model**  
M. D. Pope<sup>1</sup>, and A. R. Asthagiri<sup>1</sup>  
<sup>1</sup>Caltech, Pasadena, CA
- 11:30AM **OP-8-1-6E - Probing the Microrheology of Mesenchymal Stem Cell Migration to Tumors**  
M. Dawson<sup>1</sup>, D. McGrail<sup>1</sup>, and D. Zuelke<sup>1</sup>  
<sup>1</sup>Georgia Institute of Technology, Atlanta, GA
- 11:45AM **OP-8-1-6F - Substratum Compliance Modulates the Quantitative Interplay Between EGF and Cell-Cell Contact and Affects Contact-inhibition of Proliferation in Epithelial Cell Clusters**  
J. Kim<sup>1</sup>, and A. Asthagiri<sup>2</sup>  
<sup>1</sup>California Institute of Technology, Engineering and Applied Science, Pasadena, CA, <sup>2</sup>California Institute of Technology, Division of Chemistry and Chemical Engineering, Pasadena, CA

Track: Cardiovascular Engineering - 8-1-7

### **Vascular Permeability**

Chairs: Kenneth Barbee

Room 18C

- 10:30AM **OP-8-1-7A - Endothelial Cell Apoptosis Controls Permeability to Low Density Lipoprotein in Arterial Disease**  
L. M. Cancel<sup>1</sup>, F. Piraino<sup>2</sup>, and J. M. Tarbell<sup>1</sup>  
<sup>1</sup>The City College of New York, New York, NY, <sup>2</sup>Politecnico di Milano, Milano, Milano, Italy
- 10:45AM **OP-8-1-7B - Transendothelial Transport May Determine Adiponectin Oligomer Functions**  
J. M. Rutkowski<sup>1</sup>, and P. E. Scherer<sup>1</sup>  
<sup>1</sup>UT Southwestern Medical Center, Dallas, TX
- 11:00AM **OP-8-1-7C - Bioengineered Tools for Quantifying Lymphatic Function in Lipid Transport**  
J. Dixon<sup>1</sup>, J. A. Kornuta<sup>1</sup>, and T. Kassis<sup>1</sup>  
<sup>1</sup>Georgia Institute of Technology, Atlanta, GA
- 11:15AM **OP-8-1-7D - Assessing the Permeability of Engineered Capillary Networks in a 3D Culture**  
S. J. Grainger<sup>1</sup>, and A. J. Putnam<sup>1</sup>  
<sup>1</sup>University of Michigan, Ann Arbor, MI
- 11:30AM **OP-8-1-7E - Arginine Vasopressin Increases Aquaporin-1 Expression and Hydraulic Conductivity in Bovine Aortic Endothelium Monolayers**  
C. B. Raval<sup>1</sup>, J. M. Tarbell<sup>2</sup>, K-M. Jan<sup>3</sup>, and D. S. Rumschitzki<sup>2</sup>  
<sup>1</sup>Graduate Center at The City Univeristy New York, New York, NY, <sup>2</sup>The City College of New York, NY, NY, <sup>3</sup>Columbia University, New York, NY
- 11:45AM **OP-8-1-7F - Cholesterol Enrichment Inhibits Endothelial Capacitative Calcium Entry (CCE)**  
A. M. Andrews<sup>1</sup>, and K. A. Barbee<sup>1</sup>  
<sup>1</sup>Drexel University, Philadelphia, PA

Track: Cardiovascular Engineering - 8-1-8

### **Heart Valve I: Mechanobiology and Pathology**

Chairs: Richard Goodwin, James Warnock

Room 18D

- 10:30AM **OP-8-1-8A - Raman Spectroscopy Characterization to Compare *In Vitro* and *In Situ* Aortic Valve Calcification**  
K. L. Cloyd<sup>1</sup>, I. El-Hamamsy<sup>1</sup>, P. Sarathchandra<sup>1</sup>, E. Gentleman<sup>1</sup>, M. H. Yacoub<sup>1</sup>, A. H. Chester<sup>1</sup>, and M. M. Stevens<sup>1</sup>  
<sup>1</sup>Imperial College London, London, UK, United Kingdom

- 10:45AM **OP-8-1-8B - Interaction of Serotonin and TGF $\beta$  Signaling in Embryonic Atrioventricular Valve Remodeling**  
P. Buskohl<sup>1</sup>, M. Sun<sup>1</sup>, and J. T. Butcher<sup>1</sup>  
<sup>1</sup>Cornell University, Ithaca, NY
- 11:00AM **OP-8-1-8C - Elevated Pressure Modulates Osteogenic De-Differentiation of Aortic Valve Interstitial Cells**  
C. A. Pregonero-Gamez<sup>1</sup>, A. E. Ruhl<sup>1</sup>, and J. N. Warnock<sup>1</sup>  
<sup>1</sup>Mississippi State University, Mississippi State, MS
- 11:15AM **OP-8-1-8D - Fluid Flow Regulates ECM Protein Expression and Deposition During Cardiac Valve Development**  
H. Tan<sup>1</sup>, S. Biechler<sup>1</sup>, L. Junor<sup>1</sup>, M. J. Yost<sup>1</sup>, J. D. Potts<sup>1</sup>, and R. L. Goodwin<sup>1</sup>  
<sup>1</sup>University of South Carolina, School of Medicine, Columbia, SC
- 11:30AM **OP-8-1-8E - The Effects of Cyclic Stretch and Serotonin on Aortic Valve Remodeling**  
S. Hussain<sup>1</sup>, C. H. Yap<sup>1</sup>, K. Balachandran<sup>2</sup>, and A. Yoganathan<sup>1</sup>  
<sup>1</sup>Georgia Institute of Technology, Atlanta, GA, <sup>2</sup>Harvard University, Cambridge, MA
- 11:45AM **OP-8-1-8F - Calcium Accumulation in Strained Aortic Valve Interstitial Cells**  
J. D. Hutcheson<sup>1</sup>, and W. D. Merryman<sup>1</sup>  
<sup>1</sup>Vanderbilt University, Nashville, TN

Track: Respiratory Engineering - 8-1-9

**Microfluidics and Tissue Engineering Constructs for the Lung**

Chairs: Samir Ghadiali, Hossein Tavana  
Room 17A

- 10:30AM **OP-8-1-9A - A Human Breathing Lung-on-a-Chip**  
D. Huh<sup>1,2</sup>, B. D. Matthews<sup>2</sup>, A. Mammoto<sup>2</sup>, M. Montoya-Zavala<sup>1,2</sup>, H. Hsin<sup>2</sup>, and D. E. Ingber<sup>1,2</sup>  
<sup>1</sup>Wyss Institute for Biologically Inspired Engineering at Harvard University, Boston, MA, <sup>2</sup>Harvard Medical School and Children's Hospital Boston, Boston, MA
- 10:45AM **OP-8-1-9B - Challenging Clearance: A Mucus Clearance Assay to Study the Effect of External Forces on Clearance**  
J. Carpenter<sup>1</sup>, M. Millard<sup>1</sup>, V. Parikh<sup>1</sup>, E. T. O'Brien<sup>1</sup>, M. R. Falvo<sup>1</sup>, and R. R. Superfine<sup>1</sup>  
<sup>1</sup>UNC Chapel Hill, Chapel Hill, NC
- 11:00AM **OP-8-1-9C - The Role of Fluid Mechanical Stresses in the Development of Ventilator-Induced Lung Injury**  
N. J. Douville<sup>1</sup>, Y-C. Tung<sup>1</sup>, P. Zamankhan<sup>1</sup>, J. B. Grotberg<sup>1</sup>, and S. Takayama<sup>1</sup>  
<sup>1</sup>University of Michigan, Ann Arbor, MI
- 11:15AM **OP-8-1-9D - Shadowgraphic and  $\mu$ -PIV measurements of bubble shape and flow fields during pulsatile propagation**  
B. J. Smith<sup>1</sup>, E. Yamaguchi<sup>1</sup>, J. W. Thieman<sup>1</sup>, and D. P. Gaver III<sup>1</sup>  
<sup>1</sup>Tulane University, New Orleans, LA
- 11:30AM **OP-8-1-9E - A Biomimetic System to Investigate the Effect of Wall Compliance on Microbubble-induced Cell Injury**  
N. Higueta-Castro<sup>1</sup>, X. Chen<sup>1</sup>, C. Mihai<sup>1</sup>, D. J. Hansford<sup>1</sup>, and S. N. Ghadiali<sup>1</sup>  
<sup>1</sup>The Ohio State University, Columbus, OH
- 11:45AM **OP-8-1-9F - Predicting Cellular Strains throughout the Airway Tree with a Computational Model of Airway Mechanics**  
A. S. LaPrad<sup>1</sup>, B. Suki<sup>1</sup>, and K. R. Lutchen<sup>1</sup>  
<sup>1</sup>Boston University, Boston, MA

**Multiscale Modeling**

Chairs: Andre Levchenko, Jeffrey Saucerman

Room 17B

- 10:30AM **OP-8-1-10A - Multiscale Modeling of the ErbB Tyrosine Kinase Signaling Networks Through Theory and Experiment**  
S. E. Telesco<sup>1</sup>, R. Vadigepalli<sup>2</sup>, and R. Radhakrishnan<sup>1</sup>  
<sup>1</sup>University of Pennsylvania, Philadelphia, PA, <sup>2</sup>Thomas Jefferson University, Philadelphia, PA
- 10:45AM **OP-8-1-10B - Probabilistic Integrative Modeling of Genome-scale Metabolic and Regulatory Networks**  
S. Chandrasekaran<sup>1</sup>, and N. D. Price<sup>1</sup>  
<sup>1</sup>Institute for Genomic Biology, University of Illinois, Urbana-Champaign, Urbana, IL
- 11:00AM **OP-8-1-10C - A New Computational and Conceptual Framework for Linking Multi-cell to Tissue-Level Modeling**  
B. C. Thorne<sup>1</sup>, H. Hayenga<sup>2</sup>, J. Humphrey<sup>2</sup>, and S. M. Peirce<sup>1</sup>  
<sup>1</sup>University of Virginia, Charlottesville, VA, <sup>2</sup>Texas A&M University, College Station, TX
- 11:15AM **OP-8-1-10D - Tumor Targeting Across the Size Spectrum - Common Physiology, Divergent Pharmacokinetics**  
G. M. Thurber<sup>1</sup>, and R. Weissleder<sup>1</sup>  
<sup>1</sup>Harvard Medical School/Mass General Hospital, Boston, MA
- 11:30AM **OP-8-1-10E - Elastic Network & Finite Element Model vs. SMD to Simulate Structural Protein Mechanics**  
S. Kreuzer<sup>1</sup>, E. Khatiblou<sup>1</sup>, D. Liu<sup>1</sup>, J. Zhou<sup>1</sup>, J. Marquez<sup>1</sup>, and T. Moon<sup>1,2</sup>  
<sup>1</sup>University of Texas at Austin, Austin, TX, <sup>2</sup>Texas Materials Institute, Austin, TX
- 11:45AM **OP-8-1-10F - Computational Models of Embryonic Wound Healing**  
M. A. Wyczalkowski<sup>1</sup>, and L. A. Taber<sup>1</sup>  
<sup>1</sup>Washington University in St. Louis, St. Louis, MO

Track: Devices: Nano to Micro - 8-1-11

**Medical Diagnostics: Nano to Micro Devices - III**

Chairs: Phil LeDuc, John McDevitt

Room 16A

- 10:30AM **OP-8-1-11A - Improvement in Low Concentration Assays Using VCATs Coupled with SPRI**  
Y. Okabe<sup>1</sup>, Y. Chen<sup>1</sup>, R. Corn<sup>1</sup>, and A. Lee<sup>1</sup>  
<sup>1</sup>University of California, Irvine, Irvine, CA
- 10:45AM **OP-8-1-11B - Identification of Cancer Staging in Human Patients Using Nanoporous Silica Chips for Protein Profiling**  
E. Tasciotti<sup>1</sup>, M. Agostini<sup>2</sup>, A. Bouamrani<sup>1</sup>, T. Hu<sup>3</sup>, D. Nitti<sup>5</sup>, and M. Ferrari<sup>1</sup>  
<sup>1</sup>University of Texas Health Science Center at Houston, Houston, TX, <sup>2</sup>Universita' di Padova, Padova, Italy, <sup>3</sup>University Of Texas at Austin, Austin, TX, United States Minor Outlying Islands,
- 11:00AM **OP-8-1-11C - Aptamer-based Nanoplasmonic VEGF165 Sensor for Breast Cancer Diagnostics**  
H. Cho<sup>1</sup>, E-C. Yeh<sup>1</sup>, R. Sinha<sup>2</sup>, and L. P. Lee<sup>1</sup>  
<sup>1</sup>University of California, Berkeley, Berkeley, CA, <sup>2</sup>Pennsylvania State University, Hershey, PA
- 11:15AM **OP-8-1-11D - Detection of Cancer Related DNA Nanoparticulate Biomarkers in Whole Blood**  
M. J. Heller<sup>1</sup>, and A. Sonnenberg<sup>1</sup>  
<sup>1</sup>University of California San Diego, La Jolla, CA
- 11:30AM **OP-8-1-11E - Molecular Profiling of Tumors from Fine-Needle Aspirate Biopsies using a Miniaturized NMR Device**  
J. B. Haun<sup>1</sup>, H. Lee<sup>1</sup>, C. M. Castro<sup>1</sup>, and R. Weissleder<sup>1</sup>  
<sup>1</sup>Massachusetts General Hospital, Boston, MA
- 11:45AM **OP-8-1-11F - Integrated Molecular Diagnostic Systems (iMDs) for Sepsis Diagnostics**  
D. Mitra<sup>1</sup>, S-S. Chen<sup>1</sup>, and L. P. Lee<sup>1</sup>  
<sup>1</sup>University of California, Berkeley, Berkeley, CA

Track: Devices: Nano to Micro - 8-1-12

### **Nano to Micro: Fluidic Technologies - III**

Chairs: Sanjay Kumar, Huikai Xie

Room 16B

- 10:30AM **OP-8-1-12A - Directing Cell Migration by Dynamic Repositioning of Chemotactic Laminar Streams**  
S. Moorjani<sup>1</sup>, R. Nielson<sup>1,2</sup>, X. A. Chang<sup>1</sup>, and J. B. Shear<sup>1</sup>  
<sup>1</sup>University of Texas, Austin, TX, <sup>2</sup>BD Technologies, Research Triangle Park, NC
- 10:45AM **OP-8-1-12B - Core-Shell Biomimetic Cilia: Driven Flow in Aqueous and Viscoelastic Fluids**  
B. L. Fiser<sup>1</sup>, A. R. Shields<sup>1</sup>, D. Bober<sup>2</sup>, B. A. Evans<sup>3</sup>, and R. Superfine<sup>1</sup>  
<sup>1</sup>University of North Carolina at Chapel Hill, Chapel Hill, NC, <sup>2</sup>Swarthmore College, Swarthmore, PA, <sup>3</sup>Elon University, Elon, NC
- 11:00AM **OP-8-1-12C - A Parallelized Microfluidic Chamber Device for High-Throughput Nerve Regeneration Studies in *C. elegans***  
N. Ghorashian<sup>1</sup>, M. A. Hilliard<sup>2</sup>, and A. Ben-Yakar<sup>1</sup>  
<sup>1</sup>The University of Texas at Austin, Austin, TX, <sup>2</sup>The University of Queensland, Brisbane, Queensland, Australia
- 11:15AM **OP-8-1-12D - Open-Chamber Focal Stimulation Device for Biomimetic Study of Synaptogenesis**  
T. Chang<sup>1</sup>, N. Bhattacharjee<sup>1</sup>, and A. Folch<sup>1</sup>  
<sup>1</sup>University of Washington, Seattle, WA
- 11:30AM **OP-8-1-12E - Autonomous Microfluidic Device for Quantification and Regulation of Vasopressin**  
A. J. Chung<sup>1</sup>, I. Choi<sup>1</sup>, B. Cordovez<sup>1</sup>, Y. Huh<sup>1,2</sup>, and D. Erickson<sup>1</sup>  
<sup>1</sup>Cornell University, Ithaca, NY, <sup>2</sup>Korea Basic Science Institute, Daejeon, Chung-nam, Korea, Republic of
- 11:45AM **OP-8-1-12F - Characterization of Self-Assembled Micro/Nanochannel Fabrication in PDMS**  
W. T. Kahsai<sup>1</sup>, U. H. Pham<sup>1</sup>, R. Shafabakhsh<sup>1</sup>, J. S. Sankaran<sup>1</sup>, and S. M. IQBAL<sup>1</sup>  
<sup>1</sup>University of Texas Arlington, Arlington, TX

Track: Drug Delivery Systems \* - 8-1-13

### **Novel Materials & Self-Assembling Systems**

Chairs: Jason Burdick, Horst von Recum

Room 14

\* Drug Delivery Systems Track is sponsored by Acta Biomaterialia

- 10:30AM **OP-8-1-13A - Enzymatically-Degradable Microgels for Physiologically-Triggered Release of Therapeutic Agents**  
P. Wanakule<sup>1</sup>, A. Bergeron<sup>1</sup>, and K. Roy<sup>1</sup>  
<sup>1</sup>University of Texas at Austin, Austin, TX
- 10:45AM **OP-8-1-13B - Development of Inorganic/Organic Hybrid Based pH Responsive Hydrogels for Drug Delivery Application**  
S. Z. Khaled<sup>1</sup>, S. Dietz<sup>1</sup>, C. A. Smid<sup>1</sup>, M. Ferrari<sup>1</sup>, and E. Tasciotti<sup>1</sup>  
<sup>1</sup>The University of Texas Health Science Center at Houston, Houston, TX
- 11:00AM **OP-8-1-13C - Sustained Release Nitric Oxide From Long Lived Circulating Nanoparticles**  
P. Cabrales<sup>1</sup>  
<sup>1</sup>University of California, San Diego, La Jolla, CA
- 11:15AM **OP-8-1-13D - Novel Biodegradable PGD Polymeric Nanoparticles Preparation and Characterization**  
R. Manchanda<sup>1</sup>, Y-C. Huang<sup>1</sup>, T. Lei<sup>1</sup>, A. Fernandez-Fernandez<sup>1</sup>, and A. J. McGoron<sup>1</sup>  
<sup>1</sup>Florida International University, Miami, FL
- 11:30AM **OP-8-1-13E - Controlled Delivery of Programmable Colloidal Structures**  
M. Rafat<sup>1</sup>, J-O. You<sup>1</sup>, and D. T. Auguste<sup>1</sup>  
<sup>1</sup>Harvard University, Cambridge, MA
- 11:45AM **OP-8-1-13F - Immunosuppressive Micelles Delivered Locally to Lymph Nodes Prolong Allograft Survival**  
K. Y. Dane<sup>1</sup>, C. P. O'Neil<sup>1</sup>, C. Nembrini<sup>1</sup>, A. A. Tomei<sup>1</sup>, D. Velluto<sup>1</sup>, J. K. Eby<sup>1</sup>, M. A. Swartz<sup>1</sup>, and J. A. Hubbell<sup>1</sup>  
<sup>1</sup>Ecole Polytechnique Fédérale de Lausanne, Lausanne, Vaud, Switzerland

**Translational Drug Delivery**

Chairs: Jordan Green, Jung Suh

Room 15

\* Drug Delivery Systems Track is sponsored by Acta Biomaterialia

- 10:30AM **OP-8-1-14A - Drug Release Kinetics of Coronary Stent: An In Vivo Analysis**  
S. K. Yazdani<sup>1</sup>, F. D. Kolodgie<sup>1</sup>, and R. Virmani<sup>1</sup>  
<sup>1</sup>CVPath Institute, Gaithersburg, MD
- 10:45AM **OP-8-1-14B - Evolutionary Game Theoretical Approach for Controlled Drug Delivery of Giardiasis**  
J. Wu<sup>1</sup>, S. Lenaghan<sup>1</sup>, and M. Zhang<sup>2</sup>  
<sup>1</sup>UTK, Knoxville, TN, <sup>2</sup>University of Tennessee, Knoxville, TN
- 11:00AM **OP-8-1-14C - Novel Nanoparticle-encapsulated Compound Halts Gliomal Invasion In Vivo**  
J. M. Munson<sup>1</sup>, J. Arbiser<sup>2</sup>, and R. Bellamkonda<sup>1</sup>  
<sup>1</sup>Georgia Institute of Technology, Atlanta, GA, <sup>2</sup>Emory Medical School, Atlanta, GA
- 11:15AM **OP-8-1-14D - Hyperthermic Drug Delivery Using Metal Nanoparticles**  
N. H. Levi-Polyachenko<sup>1</sup>, A. Braden<sup>1</sup>, and M. Morykwas<sup>1</sup>  
<sup>1</sup>Wake Forest University Health Sciences, Winston-Salem, NC
- 11:30AM **OP-8-1-14E - Enhancement of Drug Uptake to Rat Tibia Tumors Using Non-Invasive Mechanical Loading**  
P. E. Palacio Mancheno<sup>1</sup>, D. Sharma<sup>1</sup>, J. H. Healey<sup>2</sup>, G. R. DiResta<sup>3</sup>, and S. P. Fritton<sup>1</sup>  
<sup>1</sup>City College of New York, New York, NY, <sup>2</sup>Memorial Sloan-Kettering Cancer Center, New York, NY, <sup>3</sup>Polytechnic Institute of NYU, New York, NY
- 11:45AM **OP-8-1-14F - Nanochannel Platform for the Controlled Delivery of Chemotherapeutics**  
A. Grattoni<sup>1</sup>, H. Shen<sup>1</sup>, D. Fine<sup>1</sup>, A. Ziemys<sup>1</sup>, J. Gill<sup>1</sup>, and M. Ferrari<sup>1,2</sup>  
<sup>1</sup>The University of Texas Health Science Center at Houston, Houston, TX, <sup>2</sup>The University of Texas MD Anderson Cancer Center, Houston, TX

**Engineered Tissue Models of Disease**

Chairs: Claudia Fischbach-Teschl, Yaakov Nahmias

Ballroom F

\* Tissue Engineering Track sponsored by Kinetic Concepts, Inc.

- 10:30AM **OP-8-1-15A - Normal and Diseased Development of Model Tissues**  
C. M. Nelson<sup>1</sup>  
<sup>1</sup>Princeton University, Princeton, NJ
- 10:45AM **OP-8-1-15B - Adipose Derived Stem Cells and Their Role in Breast Cancer Stiffening**  
B. Seo<sup>1</sup>, E. M. Chandler<sup>1</sup>, D. Tims<sup>1</sup>, M. Buckley<sup>1</sup>, I. Cohen<sup>1</sup>, and C. Fischbach<sup>1</sup>  
<sup>1</sup>Cornell University, Ithaca, NY
- 11:00AM **OP-8-1-15C - Cell-Mediated Differences Between Vascular And Valvular Calcification**  
Z. Ferdous<sup>1</sup>, H. Jo<sup>2</sup>, and R. M. Nerem<sup>3</sup>  
<sup>1</sup>Georgia Institute of Technology, Atlanta, GA, <sup>2</sup>Emory University, Atlanta, GA, <sup>3</sup>Georgia Tech/Emory Center (GTEC), Atlanta, GA
- 11:15AM **OP-8-1-15D - Persistent Hepatitis C Virus Infection in Microscale Primary Human Hepatocyte Cultures**  
A. Ploss<sup>1</sup>, S. Khetani<sup>2</sup>, C. T. Jones<sup>1</sup>, A. J. Syder<sup>3</sup>, K. Trehan<sup>4</sup>, V. A. Gaysinskaya<sup>5</sup>, K. Mu<sup>1</sup>, K. Ritola<sup>1</sup>, C. M. Rice<sup>1</sup>, and S. N. Bhatia<sup>4</sup>  
<sup>1</sup>The Rockefeller University, New York, NY, <sup>2</sup>Hepregen Corporation, Medford, MA, <sup>3</sup>iTherx Pharmaceuticals, San Diego, CA, <sup>4</sup>Massachusetts Institute of Technology, Cambridge, MA, <sup>5</sup>Johns Hopkins University, New York, NY
- 11:30AM **OP-8-1-15E - Influence of GAG Identity on SMC Foam Cell Formation**  
A. C. Jimenez<sup>1</sup>, D. Munoz-Pinto<sup>1</sup>, D. Ortiz<sup>2</sup>, and M. Hahn<sup>1</sup>  
<sup>1</sup>Texas A&M University, College Station, TX, <sup>2</sup>Texas A&M University, College Station, TX

11:45AM **OP-8-1-15F - Modeling Shock Response of Human Head Using Fluid Structure Interaction (FSI)**

N. Chandra<sup>1</sup>, L. Gu<sup>1</sup>, S. G. Ganpule<sup>1</sup>, and E. Plougonven<sup>1</sup>

<sup>1</sup>University of Nebraska Lincoln, Lincoln, NE

Track: Tissue Engineering \* - 8-1-16

**Neural Tissue Engineering - II**

Chairs: Jessica Winter, Xiaojun Yu

Ballroom G

\* Tissue Engineering Track sponsored by Kinetic Concepts, Inc.

10:30AM **OP-8-1-16A -Pre-treatment of Glia with DC Electrical Stimulation Increases Directional Neurite Outgrowth**

A. N. Eldridge<sup>1</sup>, A. Seggio<sup>1</sup>, A. Nordberg<sup>1</sup>, G. Paolillo<sup>1</sup>, and D. Thompson<sup>1</sup>

<sup>1</sup>Rensselaer Polytechnic Institute, Troy, NY

10:45AM **OP-8-1-16B -Retinal Scaffolds: Synaptic and Stem Cell Integration**

J. Hertz<sup>1</sup>, E. Lavik<sup>2</sup>, and J. L. Goldberg<sup>1</sup>

<sup>1</sup>University of Miami, Miami, FL, <sup>2</sup>Case Western Reserve, Cleveland, OH

11:00AM **OP-8-1-16C -Effects of Environment Dimensionality on DRG Neurons: 3D Better Mimics *In Vivo* Features**

A. Ribeiro<sup>1</sup>, E. Powell<sup>2</sup>, and J. Leach<sup>1</sup>

<sup>1</sup>UMBC, Chemical & Biochemical Engineering, Baltimore, MD, <sup>2</sup>University of Maryland School of Medicine, Departments of Anatomy & Neurobiology and Psychiatry, Baltimore, MD

11:15AM **OP-8-1-16D -Neural, Astroglial and Endothelial Heterotypic Cell-Cell Interactions in 3D**

Y-T. Liu<sup>1</sup>, J. R. Morgan<sup>1</sup>, and D. Hoffman-Kim<sup>1</sup>

<sup>1</sup>Brown University, Providence, RI

11:30AM **OP-8-1-16E -3D Culture Models to Study Paracrine Signaling Between Endothelial and Brain Tumor Stem Cells**

D. W. Infanger<sup>1</sup>, S. C. Liu<sup>1</sup>, D. Gursel<sup>2</sup>, J. A. Boockvar<sup>2</sup>, and C. Fischbach<sup>1</sup>

<sup>1</sup>Cornell University, Ithaca, NY <sup>2</sup>Weill Cornell Medical College of Cornell University, New York, NY

11:45AM **OP-8-1-16F -Astrocytic EphrinB2 Signaling Regulates Neuronal Differentiation of Adult Neural Stem Cells**

R. S. Ashton<sup>1</sup>, A. Conway<sup>1</sup>, C. Pangarkar<sup>2</sup>, M. Bissell<sup>2</sup>, and D. V. Schaffer<sup>1</sup>

<sup>1</sup>University of California Berkeley, Berkeley, CA, <sup>2</sup>Lawrence Berkeley National Laboratory, Berkeley, CA

**PLATFORM SESSION - 8-2 - 1:30PM - 3:00PM**

Track: Translational Biomedical Engineering - 8-2-1

**Translational Biomedical Engineering**

Chairs: Daniel G. Anderson, PhD

Room 12A

1:30PM **OP-8-2-1A - Navigating the Journey of Lab to Patient: Developing Products Based On Tyrosine-derived Polymers**

Invited Speaker: Joachim Kohn

2:00PM **OP-8-2-1B - Medical Product Development: Negotiating Its Peaks And Valleys**

Invited Speaker: Art Coury

2:30PM **OP-8-2-1C - Peripheral Nerve Regeneration Using Keratin Biomaterials: From Bench to Bedside**

L. Pace<sup>1</sup>, J. Barnwell<sup>1</sup>, Z. Li<sup>1</sup>, L. A. Koman<sup>1</sup>, T. A. Smith<sup>1</sup>, and M. Van Dyke<sup>1</sup>

<sup>1</sup>Wake Forest University School of Medicine, Winston Salem, NC

2:45PM **OP-8-2-1D - Commercializing the Avance® Nerve Graft**

C. Deister<sup>1</sup>

<sup>1</sup>AxoGen, Inc, Alachua, FL

**Imaging in Therapeutics - II**

Chairs: Stanislav Emelianov, Katherine Ferrara


Room 12B

- 1:30PM **OP-8-2-2A - Integrated Rational Design of Nanoparticle Systems for Biomedical Applications**  
A. L. van de Ven<sup>1</sup>, S. Lee<sup>2</sup>, P. Kim<sup>3</sup>, O. Haley<sup>3</sup>, S-H. Yun<sup>3</sup>, M. Ferrari<sup>1</sup>, and P. Decuzzi<sup>1</sup>  
<sup>1</sup>University of Texas Health Science Center, Houston, TX, <sup>2</sup>University of Texas, Austin, TX, <sup>3</sup>Harvard Medical School, Boston, MA
- 1:45PM **OP-8-2-2B - Targeted Microwave Hyperthermia Using Magnetite Nanoparticles**  
J. R. Cook<sup>1</sup>, S. Kim<sup>1</sup>, J. A. Pearce<sup>1</sup>, and S. Y. Emelianov<sup>1</sup>  
<sup>1</sup>University of Texas at Austin, Austin, TX
- 2:00PM **OP-8-2-2C - Methods for Creating Carbon Nanohorn-Quantum Dot Conjugates and an Investigation of Cellular Uptake**  
K. A. Zimmermann<sup>1</sup>, J. Zhang<sup>1</sup>, H. Dorn<sup>1</sup>, C. G. Rylander<sup>1</sup>, and M. N. Rylander<sup>1</sup>  
<sup>1</sup>Virginia Polytechnic Institute and State University, Blacksburg, VA
- 2:15PM **OP-8-2-2D - Tracking Modeling and Predicting the Erosion of Fluorescently Labeled Materials Noninvasively**  
N. Artzi<sup>1,2</sup>, C. Puron<sup>1,3</sup>, A. B. Ramos<sup>1,3</sup>, A. Groothuis<sup>4</sup>, G. Sahagian<sup>5</sup>, and E. Edelman<sup>1,6</sup>  
<sup>1</sup>MIT, Cambridge, MA, <sup>2</sup>Brigham and Women Hospital, Harvard Medical School, Boston, MA, <sup>3</sup>Institut Quimic de Sarria, Barcelona, Spain, Spain, <sup>4</sup>CBSET, Concord, MA, <sup>5</sup>Tufts University School of Medicine, Boston, MA, <sup>6</sup>Brigham and Women's Hospital, Harvard Medical School, Boston, MA
- 2:30PM **OP-8-2-2E - Irreversible Electroporation Treatment Planning Techniques**  
R. E. Neal<sup>1</sup>, P. A. Garcia<sup>1</sup>, J. H. Rossmeis<sup>2</sup>, and R. V. Davalos<sup>1</sup>  
<sup>1</sup>Virginia Tech - Wake Forest School of Biomedical Engineering and Sciences, Blacksburg, VA, <sup>2</sup>Virginia - Maryland Regional College of Veterinary Medicine, Blacksburg, VA
- 2:45PM **OP-8-2-2F - Multifractal and Lacunarity Analysis of Microvasculature**  
D. J. Gould<sup>1,2</sup>, T. J. Vadakkan<sup>2</sup>, and M. E. Dickinson<sup>1,2</sup>  
<sup>1</sup>Rice University, Houston, TX, <sup>2</sup>Baylor College of Medicine, Houston, TX

**Biophotonics - I**

Chairs: Kristen Maitland, Brian Sorg

Room 19A

- 1:30PM **OP-8-2-3A - Fiber Optic Probe for Measuring Changes in Rectal Micro Architecture and Vasculature in Field of Carcinogenesis: Implications for Colon Cancer risk Stratification**   
N. N. Mutyal<sup>1</sup>, V. Turzhitsky<sup>1</sup>, J. Rogers<sup>1</sup>, A. Radosevich<sup>1</sup>, H. Roy<sup>2</sup>, M. Goldberg<sup>2</sup>, M. Jameel<sup>2</sup>, A. Bogojevich<sup>2</sup>, and V. Backman<sup>1</sup>  
<sup>1</sup>Northwestern University, Evanston, IL, <sup>2</sup>Northshore University Healthsystems, Evanston, IL
- 1:45PM **OP-8-2-3B - Simultaneous Imaging of Blood Flow, Hemoglobin Concentration, and Absolute PO<sub>2</sub> In Vivo During Stroke Using a Digital Micromirror Device**  
A. Ponticorvo<sup>1</sup>, M. A. Davis<sup>1</sup>, and A. K. Dunn<sup>1</sup>  
<sup>1</sup>University of Texas at Austin, Austin, TX
- 2:00PM **OP-8-2-3C - Blood Vessel Detection in Line-Scanning Laser Ophthalmoscope and Raster Scan Images from Optical Coherence Tomography**  
A. Datta<sup>1</sup>, S. Liu<sup>1</sup>, G. Muralidhar<sup>1</sup>, A. S. Paranjape<sup>1</sup>, B. Elmaanaoui<sup>1</sup>, J. Dewelle<sup>1</sup>, T. E. Milner<sup>1</sup>, H. G. Rylander III<sup>1</sup>, and M. K. Markey<sup>1</sup>  
<sup>1</sup>The University of Texas at Austin, Austin, TX
- 2:15PM **OP-8-2-3D - Enhancing Video Capsule Endoscopy: Location and Bleeding Detection**  
D. L-P. Yeung<sup>1</sup>, A. Sabet<sup>1</sup>, Y. Inoue<sup>1</sup>, and J. M. Yap<sup>1</sup>  
<sup>1</sup>University of Michigan, Ann Arbor, MI
- 2:30PM **OP-8-2-3E - Image Mapping Spectrometer for Real Time Hyperspectral Imaging of Living Cells**  
L. Gao<sup>1</sup>, R. T. Kester<sup>1</sup>, N. Bedard<sup>1</sup>, N. Hagen<sup>1</sup>, and T. S. Tkaczyk<sup>1</sup>  
<sup>1</sup>Rice University, Houston, TX

2:45PM **OP-8-2-3F - Fiber Optic Micro-endoscopy for *In Vivo* Detection of Bacteria in Early Stages of Infection**  
N. S. Mufti<sup>1</sup>, Y. Kong<sup>2</sup>, J. D. Cirillo<sup>2</sup>, and K. C. Maitland<sup>1</sup>  
<sup>1</sup>Texas A&M University, College Station, TX, <sup>2</sup>Texas A&M Health Science Center, College Station, TX

Track: Neural Engineering - 8-2-4

### **Sensory Neural Prosthetics**

Chairs: Hubert Lim, James Weiland  
Room 19B

1:30PM **OP-8-2-4A - A Robust, Multimodal, Biomimetic Tactile Sensor**  
J. A. Fishel<sup>1,2</sup>, N. Wettels<sup>1,2</sup>, C. H. Lin<sup>1,2</sup>, Z. Su<sup>1</sup>, and G. E. Loeb<sup>1,2</sup>  
<sup>1</sup>University of Southern California, Los Angeles, CA, <sup>2</sup>SynTouch, LLC, Los Angeles, CA

1:45PM **OP-8-2-4B - Restoring Sensorimotor Function with Utah Slanted Electrode Arrays in Peripheral Nerves**  
G. A. Clark<sup>1</sup>, N. M. Ledbetter<sup>1</sup>, D. J. Warren<sup>1</sup>, A. M. Wilder<sup>1</sup>, B. R. Dowden<sup>1</sup>, M. A. Frankel<sup>1</sup>, C. Ethier<sup>2</sup>, E. R. Oby<sup>2</sup>, L. E. Miller<sup>2</sup>, F. Solzbacher<sup>1</sup>, R. R. Harrison<sup>1</sup>, and R. A. Normann<sup>1</sup>  
<sup>1</sup>University of Utah, Salt Lake City, UT, <sup>2</sup>Northwestern University Feinberg School of Medicine, Chicago, IL

2:00PM **OP-8-2-4C - Direct Sensory Feedback for Prosthetics: Neural Mechanisms of Function, Plasticity, and Ownership**  
P. D. Marasco<sup>1</sup>, A. E. Schultz<sup>2</sup>, K. Kim<sup>3</sup>, J. E. Colgate<sup>4</sup>, M. A. Peshkin<sup>4</sup>, and T. A. Kuiken<sup>2</sup>  
<sup>1</sup>Louis Stokes Cleveland Department of Veterans Affairs Medical Center, Cleveland, OH, <sup>2</sup>Rehabilitation Institute of Chicago, Chicago, IL, <sup>3</sup>Korea Institute of Science and Technology, Seoul, Korea, Republic of, <sup>4</sup>Northwestern University, Evanston, IL

2:15PM **OP-8-2-4D - Electrical Stimulation of Degenerated Retina with High Resolution Electrode**  
J. Weiland<sup>1,2</sup>, L. Chan<sup>1</sup>, A. Ray<sup>1</sup>, and M. Humayun<sup>1,2</sup>  
<sup>1</sup>University of Southern California, Los Angeles, CA, <sup>2</sup>Doheny Eye Institute, Los Angeles, CA

2:30PM **OP-8-2-4E - Solutions to problem of electrode channel interaction in a vestibular prosthesis**  
G. Y. Fridman<sup>1</sup>, C. Dai<sup>1</sup>, N. S. Davidovics<sup>1</sup>, B. Chiang<sup>1</sup>, and C. C. Della Santina<sup>1</sup>  
<sup>1</sup>Johns Hopkins University, Baltimore, MD

2:45PM **OP-8-2-4F - New Directions in Deep Brain Stimulation (DBS) for Hearing Restoration and Tinnitus Suppression**  
H. H. Lim<sup>1</sup>, M. Lenarz<sup>2</sup>, and T. Lenarz<sup>2</sup>  
<sup>1</sup>University of Minnesota, Minneapolis, MN, <sup>2</sup>Hannover Medical University, Hannover, Lower Saxony, Germany

Track: Biomedical Engineering Education - 8-2-5

### **Global Health**

Chairs: Justin Cooper, Mohammad Kiani  
Room 18A

1:30PM **OP-8-2-5A - Biomedical Technician Assistant (BTA) and Biomedical Engineering Technician Training in Rwanda**  
L. E. Perry<sup>1</sup>, and R. Malkin<sup>1</sup>  
<sup>1</sup>Duke University, Durham, NC

1:45PM **OP-8-2-5B - Early Experiences Implementing a Low Resource Settings BME Curriculum at the US-Mexico border**  
T. Boland<sup>1</sup>  
<sup>1</sup>University of Texas at El Paso, El Paso, TX

2:00PM **OP-8-2-5C - Collaboration for Healthcare in Developing Countries**  
A. L. Lerner<sup>1</sup>, S. H. Seidman<sup>1</sup>, B. Castaneda<sup>2</sup>, and W. Carrera<sup>2</sup>  
<sup>1</sup>University of Rochester, Rochester, NY, <sup>2</sup>Pontificia Universidad Catolica del Peru, Lima, Peru

2:15PM **OP-8-2-5D - Multifaceted Engineering Education is Facilitated by Design of Medical Devices for Kenya**  
P. J. Butler<sup>1</sup>, and K. Mehta<sup>1</sup>  
<sup>1</sup>Penn State University, University Park, PA

2:30PM **OP-8-2-5E - Design of a Dental Chair for Rural Communities: An International Collaboration**  
G. M. Ruiz Soto<sup>1</sup>, and A. Louie<sup>2</sup>  
<sup>1</sup>ITESM, Monterrey, Nuevo Leon, Mexico, <sup>2</sup>University of California, Davis, CA

2:45PM **OP-8-2-5F - X-Ray Development Timer**  
A. F. Britt<sup>1</sup>, and P. G. Anderson<sup>2</sup>  
<sup>1</sup>Duke, Winnetka, IL, <sup>2</sup>Duke University, Durham, NC

Track: Cellular and Molecular Engineering - **8-2-6**

**Cell Adhesion - II**

Chairs: Nathan Gallant, Andres Garcia  
Room 18B

1:30PM **OP-8-2-6A - Force Dynamics of Cell-Cell Interaction Mediated Through Cell-Matrix Adhesion**  
O. Shebanova<sup>1</sup>  
<sup>1</sup>University of Pennsylvania, Philadelphia, PA

1:45PM **OP-8-2-6B - Vinculin Modulates Cell Adhesion Strength in Response to Fibronectin Density**  
D. W. Dumbauld<sup>1</sup>, S. W. Craig<sup>2</sup>, and A. J. Garcia<sup>1</sup>  
<sup>1</sup>Georgia Institute of Technology, Atlanta, GA, <sup>2</sup>The Johns Hopkins School of Medicine, Baltimore, MD

2:00PM **OP-8-2-6C - Nitric Oxide Impairs the Adhesive Properties of Dendritic Cells to Extracellular Matrix Components**  
M. Gu<sup>1</sup>, J. McGinty<sup>2</sup>, A. Venkatesh<sup>1</sup>, M. Pate<sup>2</sup>, and F. Benencia<sup>1,2</sup>  
<sup>1</sup>Russ College of Engineering, Ohio University, Athens, OH, <sup>2</sup>OUCOM, Ohio University, Athens, OH

2:15PM **OP-8-2-6D - Structural Elastic Memory of Immune Synapse Cytoskeleton**  
E. Tabdanov<sup>1</sup>, E. Judokusumo<sup>1</sup>, and L. C. Kam<sup>1</sup>  
<sup>1</sup>Columbia University, New York, NY

2:30PM **OP-8-2-6E - Rap1 and SLP-76 are Crucial to Chemokine-Triggered Firm Adhesion of T Cells under Flow**  
D. Lee<sup>1</sup>, J. Kim<sup>1</sup>, G. T. Koretzky<sup>1</sup>, and D. A. Hammer<sup>1</sup>  
<sup>1</sup>University of Pennsylvania, Philadelphia, PA

2:45PM **OP-8-2-6F - Characterization of HNSCC Ligand and Endothelium Receptor Interactions**  
J. Marshall<sup>1</sup>, S. M. Wood<sup>1</sup>, C. Abram<sup>1</sup>, L. Nimrichter<sup>2</sup>, and M. M. Burdick<sup>1</sup>  
<sup>1</sup>Ohio University, Athens, OH, <sup>2</sup>Universidade do Rio de Janeiro, Rio de Janeiro, Rio de Janeiro, Brazil

Track: Cardiovascular Engineering - **8-2-7**

**Vascular Structure and Function I: Pathology**

Chairs: Peter Davies, Damir B. Khismatullin  
Room 18C

1:30PM **OP-8-2-7A - Endothelial DNA Methylation Differences Map to Athero-susceptible and Atheroprotected Sites *In Vivo***  
J. E. Clark<sup>1</sup>, and P. F. Davies<sup>1</sup>  
<sup>1</sup>University of Pennsylvania, Philadelphia, PA

1:45PM **OP-8-2-7B - Endothelial Gene Connectivity Network Analysis Identifies Distinct Coronary Artery Phenotypes**  
M. Civelek<sup>1</sup>, E. Manduchi<sup>2</sup>, R. J. Riley<sup>2</sup>, C. J. Stoeckert Jr<sup>2</sup>, and P. F. Davies<sup>2</sup>  
<sup>1</sup>University of California, Los Angeles, Los Angeles, CA, <sup>2</sup>University of Pennsylvania, Philadelphia, PA

2:00PM **OP-8-2-7C - Quantitative Mechanical Tests of Mouse Atherosclerotic Plaque Stability**  
Y. Wang<sup>1,2</sup>, J. Ning<sup>1</sup>, M. A. Sutton<sup>1</sup>, and S. M. Lessner<sup>1,2</sup>  
<sup>1</sup>University of South Carolina, Columbia, SC, <sup>2</sup>University of South Carolina, School of Medicine, Columbia, SC

- 2:15PM **OP-8-2-7D - Rapid Remodeling of Cardiovascular Tissues During Pregnancy**  
S. Wells<sup>1</sup>, D. DeBay<sup>1</sup>, A. Moeller<sup>1</sup>, C. Pierlot<sup>1</sup>, J. Doane<sup>1</sup>, and M. Lee<sup>1</sup>  
<sup>1</sup>Dalhousie University, Halifax, NS, Canada
- 2:30PM **OP-8-2-7E - Hyperglycemia Reduces Nitric Oxide, Increases Nitrotyrosine and Apoptosis in Endothelial Cell**  
S. C. Rogers<sup>1</sup>, and M. Kavdia<sup>1</sup>  
<sup>1</sup>University of Arkansas, Fayetteville, AR
- 2:45PM **OP-8-2-7F - Histamine Induces Monocyte Interactions with Arterial Endothelium *In Vitro***  
C. Chen<sup>1</sup>, and D. B. Khismatullin<sup>1</sup>  
<sup>1</sup>Tulane University, New Orleans, LA

Track: Cardiovascular Engineering - 8-2-8

**Cardiovascular Computational Modeling and Measurement - I**

Chairs: Michael Sacks, Fotis Sotiropoulos

Room 18D

- 1:30PM **OP-8-2-8A - Spatial Characterization of Coronary Artery Pathologies using Optical Coherence Tomography**  
L. M. Ellwein<sup>1</sup>, H. Otake<sup>2</sup>, B-K. Koo<sup>3</sup>, T. Shinke<sup>4</sup>, Y. Honda<sup>2</sup>, J. Shite<sup>4</sup>, and J. F. LaDisa<sup>1</sup>  
<sup>1</sup>Marquette University, Milwaukee, WI, <sup>2</sup>Stanford University, Stanford, CA, <sup>3</sup>Seoul National University College of Medicine, Seoul, Korea, Republic of, <sup>4</sup>Kobe University Graduate School of Medicine, Kobe, Japan
- 1:45PM **OP-8-2-8B - Differential Gene Expression, Ecm Organization And Multi-scale Mechanics Of The Aortic And Pulmonary Valve**  
C. A. Carruthers<sup>1</sup>, C. M. Alfieri<sup>2</sup>, E. M. Joyce<sup>1</sup>, K. E. Yutzey<sup>2</sup>, and M. S. Sacks<sup>1</sup>  
<sup>1</sup>University of Pittsburgh, Pittsburgh, PA, <sup>2</sup>Cincinnati Children's Medical Center, Cincinnati, OH
- 2:00PM **OP-8-2-8C - Imaging-Based Lagrangian Fluid-Structure Interaction of the Mitral Valve: Trans-Chordal Fluid Dynamics**  
D. R. Einstein<sup>1</sup>, F. del Pin<sup>2</sup>, J-P. Rabbah<sup>3</sup>, S. R. Idelsohn<sup>4</sup>, A. P. Kuprat<sup>1</sup>, X. Jiao<sup>5</sup>, J. P. Carson<sup>1</sup>, A. P. Yoganathan<sup>3</sup>, and K. S. Kunzelman<sup>6</sup>  
<sup>1</sup>Pacific Northwest National Laboratory, Richland, WA, <sup>2</sup>Livermore Software Technology Corp, Livermore, CA, <sup>3</sup>Georgia Tech, Atlanta, GA, <sup>4</sup>International Center for Numerical Methods in Engineering (CIMNE), Barcelona, Spain, <sup>5</sup>Stony Brook University, Stony Brook, NY, <sup>6</sup>University of Maine, Lewiston, ME
- 2:15PM **OP-8-2-8D - Multi-modality Experimental Platform for Validation of Dynamic Mitral Valve Computation Models**  
J-P. Rabbah<sup>1</sup>, N. Saikrishnan<sup>1</sup>, and A. P. Yoganathan<sup>1</sup>  
<sup>1</sup>Georgia Institute of Technology, Atlanta, GA
- 2:30PM **OP-8-2-8E - Predicted Arterial Changes during Hypertension using Multi-Scale Modeling**  
H. N. Hayenga<sup>1</sup>, B. C. Thorne<sup>2</sup>, S. M. Peirce<sup>2</sup>, and J. D. Humphrey<sup>1</sup>  
<sup>1</sup>Texas A&M University, College Station, TX, <sup>2</sup>University of Virginia, Charlottesville, VA
- 2:45PM **OP-8-2-8F - Computational Evaluation of Mechanical Heart Valve Prosthesis Performance in Patient-Specific Anatomies**  
T. Le<sup>1</sup>, I. Borazjani<sup>1</sup>, and F. Sotiropoulos<sup>1</sup>  
<sup>1</sup>University of Minnesota, Minneapolis, MN

Track: Respiratory Engineering - 8-2-9

**Imaging the Lung – The New Frontier**

Chairs: Eric Hoffman, Grace Parraga

Room 17A

- 1:30PM **OP-8-2-9A - Imaging Morphometry of the Acinus Within the Intact Murine Lung**  
D. M. Vasilescu<sup>1,2</sup>, A. S. Kizhakke Puliyakote<sup>1</sup>, T. M. Eggleston<sup>1</sup>, and E. A. Hoffman<sup>1</sup>  
<sup>1</sup>University of Iowa, Iowa City, IA, <sup>2</sup>Philipps University, Marburg, Hessen, Germany
- 1:45PM **OP-8-2-9B - Effect of Lung Inflation on Canine Airway Dimensions *In Vivo***  
D. Chon<sup>1</sup>, B. A. Simon<sup>1,2</sup>, and D. W. Kaczka<sup>1,2</sup>  
<sup>1</sup>Beth Israel Deaconess Medical Center, Boston, MA, <sup>2</sup>Harvard Medical School, Boston, MA

- 2:00PM **OP-8-2-9C - Effects of Gas Properties on Regional Ventilation: Comparison between MDCT and MRI Assessments**  
Y. Yin<sup>1</sup>, A. Halaweish<sup>1</sup>, C-L. Lin<sup>1</sup>, E. van Beek<sup>1</sup>, and E. A. Hoffman<sup>1</sup>  
<sup>1</sup>The University of Iowa, Iowa City, IA
- 2:15PM **OP-8-2-9D - Quantification of Lung Pressure Volume Curves and Regional Expansion with Respiratory-Gated <sup>13</sup>N<sub>2</sub> PET**  
T. J. Wellman<sup>1</sup>, T. Winkler<sup>2</sup>, E. L. Costa<sup>2</sup>, R. S. Harris<sup>2</sup>, G. Musch<sup>2</sup>, J. G. Venegas<sup>2</sup>, and M. F. Vidal Melo<sup>2</sup>  
<sup>1</sup>Boston University, Boston, MA, <sup>2</sup>Massachusetts General Hospital, Boston, MA
- 2:30PM **OP-8-2-9E - The Relationship of Ultra Short Echo Time 1H Magnetic Resonance Imaging and Pulmonary Function in Chronic Obstructive Pulmonary Disease**  
A. Owrangi<sup>1,2</sup>, J. X. Wang<sup>1,3</sup>, E. O'Riordan<sup>4</sup>, D. G. McCormack<sup>5</sup>, and G. Parraga<sup>1,2</sup>  
<sup>1</sup>Robarts Research Institute, London, Ontario, Canada, <sup>2</sup>Biomedical Engineering, University of Western Ontario, London, Ontario, Canada, <sup>3</sup>General Electric Healthcare CANADA, London, Ontario, Canada, <sup>4</sup>Department of Medical Imaging, University of Western Ontario, London, Ontario, Canada, <sup>5</sup>Division of Respiriology, University of Western Ontario, London, Ontario, Canada
- 2:45PM **OP-8-2-9F - Automatic Segmentation of Ventilation Defects in Hyperpolarized 3He MRI**  
N. J. Tustison<sup>1</sup>, B. B. Avants<sup>1</sup>, T. A. Altes<sup>2</sup>, E. E. de Lange<sup>2</sup>, J. P. Mugler<sup>2</sup>, and J. C. Gee<sup>1</sup>  
<sup>1</sup>University of Pennsylvania, Philadelphia, PA, <sup>2</sup>University of Virginia, Charlottesville, VA

Track: Orthopedic and Rehabilitation Engineering - **8-2-10**

**Rehabilitation Engineering**

Chairs: John DesJardins, Joel Stitzel  
Room 17B

- 1:30PM **OP-8-2-10A - Mapping Different Mechanical Response in the Infected and Inflamed Ears with Laser Vibrometer**  
C. Dai<sup>1</sup>, X. Guan<sup>1</sup>, W. Li<sup>1</sup>, D. Nakamalil<sup>1</sup>, and G. R. Gan<sup>1</sup>  
<sup>1</sup>University of Oklahoma, Norman, OK
- 1:45PM **OP-8-2-10B -Dynamic Stability of Walking During Support Surface and Visual Field Translations**  
P. M. McAndrew<sup>1</sup>, J. B. Dingwell<sup>1</sup>, and J. M. Wilken<sup>2</sup>  
<sup>1</sup>University of Texas at Austin, Austin, TX, <sup>2</sup>Center for the Intrepid, Ft. Sam Houston, TX
- 2:00PM **OP-8-2-10C -Feature Projection Framework to Improve the Performance of a Myoelectric Pattern Recognition System**  
J. M. Fontana<sup>1</sup>, and A. W. Chiu<sup>1</sup>  
<sup>1</sup>Louisiana Tech University, Ruston, LA
- 2:15PM **OP-8-2-10D -Effect of Endurance Exercise Training and Chronic Ethanol Ingestion on Skeletal Muscle in Rat**  
S. Iyer<sup>1</sup>, M. Sackell<sup>1</sup>, C. Zappacosta<sup>1</sup>, and Y. Gao<sup>1</sup>  
<sup>1</sup>Cornell University, Ithaca, NY
- 2:30PM **OP-8-2-10E -Physical Activity Classification Utilizing Activity Monitors in Manual Wheelchair Users with SCI**  
S. V. Hiremath<sup>1</sup>, and D. Ding<sup>1</sup>  
<sup>1</sup>University of Pittsburgh, Pittsburgh, PA
- 2:45PM **OP-8-2-10F - The Effects of Computer Keyboarding on Median Nerve Ultrasound Measures**  
K. Toosi<sup>1</sup>, and M. Boninger<sup>1</sup>  
<sup>1</sup>University of Pittsburgh, Pittsburgh, PA

Track: Devices: Nano to Micro - **8-2-11**

**Drug Delivery Technologies: Nano to Micro Devices - I**

Chairs: Tejal Desai, Sihong Wang  
Room 16A

- 1:30PM **OP-8-2-11A - A Strategy for Chronic Convection-Enhanced Drug Delivery to the Brain**  
E. S-M. Chang<sup>1</sup>, and W. Olbricht<sup>1</sup>  
<sup>1</sup>Cornell University, Ithaca, NY

- 1:45PM **OP-8-2-11B - Multi-functional Coatings for the Delivery of Small Molecule Therapeutics**  
A. Shukla<sup>1</sup>, R. C. Smith<sup>1</sup>, and P. T. Hammond<sup>1</sup>  
<sup>1</sup>Massachusetts Institute of Technology, Cambridge, MA
- 2:00PM **OP-8-2-11C - Synthesis of Biodegradable Porous Silicon Nanoneedles for Combined Gene Therapy and Proteomics**  
C. Chiappini<sup>1</sup>, J. Fakhoury<sup>2</sup>, X. Liu<sup>2</sup>, E. Tasciotti<sup>2</sup>, L. Brousseau<sup>2</sup>, and M. Ferrari<sup>1,2</sup>  
<sup>1</sup>The University of Texas at Austin, Austin, TX, <sup>2</sup>The University of Texas Health Science Center at Houston, Houston, TX
- 2:15PM **OP-8-2-11D - Particle Size Dictates the Efficacy of Vascular-Targeted Drug Carrier in Disturbed Flow Relevant in Atherosclerosis**  
P. Charoenphol<sup>1</sup>, and O. Eniola-Adefeso<sup>2</sup>  
<sup>1</sup>University of Michigan, Ann Arbor, MI, <sup>2</sup>University of Michigan, Ann Arbor, MI
- 2:30PM **OP-8-2-11E - The Influence of Size on the Interaction of Nanomaterials with Blood Serum**  
C. Walkey<sup>1</sup>, and W. Chan<sup>1</sup>  
<sup>1</sup>University of Toronto, Toronto, Ontario, Canada
- 2:45PM **OP-8-2-11F - Metal-Polymer Composite Nanoparticle Systems for Externally Controlled Delivery**  
M. L. Gran<sup>1</sup>, and N. A. Peppas<sup>1</sup>  
<sup>1</sup>University of Texas at Austin, Austin, TX

Track: Devices: Nano to Micro - **8-2-12**

### **Micro and Nanostructured Biomaterials - I**

Chairs: Xuanhong Cheng, Song Li

Room 16B

- 1:30PM **OP-8-2-12A - Microstructures in 3D Culture Alter the Mechanics of Cardiac Myocyte Contraction**  
M. W. Curtis<sup>1</sup>, E. Budyn<sup>1</sup>, T. Desai<sup>2</sup>, and B. Russell<sup>1</sup>  
<sup>1</sup>University of Illinois at Chicago, Chicago, IL, <sup>2</sup>University of California at San Francisco, San Francisco, CA
- 1:45PM **OP-8-2-12B - Purified Single Wall Carbon Nanotubes Reorganize the Actin Cytoskeleton**  
B. D. Holt<sup>1</sup>, P. A. Short<sup>1</sup>, K. N. Dahl<sup>1</sup>, and M. F. Islam<sup>1</sup>  
<sup>1</sup>Carnegie Mellon University, Pittsburgh, PA
- 2:00PM **OP-8-2-12C - Nanotube Coatings for Cell Isolation Alter Cell Separation Distance While Preserving Fluid Dynamics**  
A. D. Hughes<sup>1</sup>, and M. R. King<sup>1</sup>  
<sup>1</sup>Cornell University, Ithaca, NY
- 2:15PM **OP-8-2-12D - Treatment of Primary Brain Tumors with Thermally Activated Nanoparticles**  
E. S. Day<sup>1</sup>, L. Zhang<sup>2</sup>, P. A. Thompson<sup>2</sup>, N. A. Lewinski<sup>1</sup>, N. Ahmed<sup>2</sup>, N. S. Riggall<sup>1</sup>, R. A. Drezek<sup>1</sup>, S. M. Blaney<sup>2</sup>, and J. L. West<sup>1</sup>  
<sup>1</sup>Rice University, Houston, TX, <sup>2</sup>Texas Children's Hospital, Houston, TX
- 2:30PM **OP-8-2-12E - Prostate Cancer Cell Photothermal Therapy with EphrinA1-Targeted Nanoshells**  
A. J. Coughlin<sup>1</sup>, A. M. Gobin<sup>1</sup>, J. J. Moon<sup>1</sup>, and J. L. West<sup>1</sup>  
<sup>1</sup>Rice University, Houston, TX
- 2:45PM **OP-8-2-12F - DNA Nanocomplexes Synthesized in a Microfluidic Droplet Generator**  
Y-P. Ho<sup>1</sup>, C. Grigsby<sup>1</sup>, F. Zhao<sup>1</sup>, H. Li<sup>1</sup>, and K. W. Leong<sup>1</sup>  
<sup>1</sup>Duke University, Durham, NC

Track: Drug Delivery Systems \* - **8-2-13**

### **Novel Materials & Self-Assembling Systems: Cancer Applications**

Chairs: Jason Burdick, Horst von Recum

Room 14

\* Drug Delivery Systems Track is sponsored by Acta Biomaterialia

- 1:30PM **OP-8-2-13A - Chitosan Delivery System for Protein-Based Vaccines**  
M. J. Heffernan<sup>1</sup>, J. W. Schlom<sup>1</sup>, and J. W. Greiner<sup>1</sup>  
<sup>1</sup>National Cancer Institute, Bethesda, MD

- 1:45PM **OP-8-2-13B - Peptide Amphiphiles for Cancer Therapy**  
M. Black<sup>1</sup>, and M. Tirrell<sup>1,2</sup>  
<sup>1</sup>University of California, Santa Barbara, CA, <sup>2</sup>University of California, Berkeley, CA
- 2:00PM **OP-8-2-13C - Optimal Conditions for Tumor Retention of a Thermally Responsive Polypeptide After Intratumoral Dosing**  
W. Liu<sup>1</sup>, J. R. McDaniel<sup>1</sup>, X. Li<sup>1</sup>, M. R. Zalutsky<sup>1</sup>, and A. Chilkoti<sup>1</sup>  
<sup>1</sup>Duke University, Durham, NC
- 2:15PM **OP-8-2-13D - A Leukolike Multistage Delivery System to Overcome Biological Barriers**  
N. Quattrocchi<sup>1</sup>, C. Chiappini<sup>2</sup>, L. Cooper<sup>3</sup>, M. Masserini<sup>4</sup>, M. Ferrari<sup>1</sup>, and E. Tasciotti<sup>1</sup>  
<sup>1</sup>The University of Texas Health Science Center at Houston, Houston, TX, <sup>2</sup>The University of Texas at Austin, Austin, TX, <sup>3</sup>The University of Texas M.D. Anderson Cancer Center, Houston, TX, <sup>4</sup>Universita' Milano Bicocca, Monza, Milano, Italy
- 2:30PM **OP-8-2-13E - Chimeric Polypeptide-Doxorubicin Nanoparticle Self-Assembly Abolish Tumors After A Single Injection**  
M. Chen<sup>1</sup>, J. MacKay<sup>2</sup>, J. McDaniel<sup>1</sup>, W. Liu<sup>1</sup>, T. Chu<sup>1</sup>, A. Simnick<sup>1</sup>, and A. Chilkoti<sup>1</sup>  
<sup>1</sup>Duke University, Durham, NC, <sup>2</sup>University of Southern California, Los Angeles, CA
- 2:45PM **OP-8-2-13F - Synthetic Polyphenols for Drug Delivery and Polymer Therapeutics**  
O. Z. Fisher<sup>1</sup>, R. Langer<sup>1</sup>, and D. G. Anderson<sup>1</sup>  
<sup>1</sup>MIT, Cambridge, MA

Track: New Frontiers in Bioengineering - 8-2-14

**Immunobioengineering - II**

Chairs: Jeffrey Hubbell, Darrell Irvine  
Room 15

- 1:30PM **OP-8-2-14A - Combinatorial Delivery of TLR 4 and 7 Ligands Using Nanoparticles Mediates Protective Immunity Against Pandemic Influenza**  
S. P. Kasturi<sup>1</sup>, I. Skountzou<sup>1</sup>, R. A. Albrecht<sup>2</sup>, D. Koutsonanos<sup>1</sup>, T. Hua<sup>1</sup>, H. Nakaya<sup>1</sup>, R. Ravindran<sup>1</sup>, S. Stewart<sup>3</sup>, M. Alam<sup>3</sup>, N. Murthy<sup>4</sup>, J. Steel<sup>2</sup>, J. Jacob<sup>1</sup>, R. J. Hogan<sup>2</sup>, A. Garcia-Sastre<sup>2</sup>, R. Compans<sup>1</sup>, and B. Pulendran<sup>1</sup>  
<sup>1</sup>Emory University, Atlanta, GA, <sup>2</sup>Mount Sinai School of Medicine, New York, NY, <sup>3</sup>Duke University Medical Center, Durham, NC, <sup>4</sup>Georgia Institute of Technology, Atlanta, GA
- 1:45PM **OP-8-2-14B - Interbilayer-Crosslinked Multilamellar Vesicles for Antigen Delivery and Vaccine Applications**  
J. J. Moon<sup>1</sup>, H. Suh<sup>1</sup>, M. Sohail<sup>1</sup>, A. Bershteyn<sup>1</sup>, A. Yadava<sup>2</sup>, and D. J. Irvine<sup>1,3</sup>  
<sup>1</sup>Massachusetts Institute of Technology, Cambridge, MA, <sup>2</sup>Walter Reed Army Institute of Research, Silver Spring, MD, <sup>3</sup>Howard Hughes Medical Institute, Chevy Chase, MD
- 2:00PM **OP-8-2-14C - Simultaneous, Single-carrier Delivery of Antigens and Immune-modulatory siRNA to Dendritic Cells**  
E. R. Dawson<sup>1</sup>, A. Singh<sup>1</sup>, T. Vo<sup>1</sup>, and K. Roy<sup>1</sup>  
<sup>1</sup>The University of Texas at Austin, Austin, TX
- 2:15PM **OP-8-2-14D - Lymphatic Drainage in Immunity: Implications in Lymph Node Targeting Strategies for Immunomodulation**  
S. N. Thomas<sup>1</sup>, J. Rutkowski<sup>1</sup>, and M. A. Swartz<sup>1</sup>  
<sup>1</sup>Swiss Federal Institute of Technology, Lausanne, VD, Switzerland
- 2:30PM **OP-8-2-14E - In Situ Regulation of DC Subsets and T Cells Mediates Tumor Regression in Mice**  
O. A. Ali<sup>1</sup>, D. Emerich<sup>2</sup>, G. Dranoff<sup>3</sup>, and D. J. Mooney<sup>1</sup>  
<sup>1</sup>Harvard University, Cambridge, MA, <sup>2</sup>Incytu, Inc, Lincoln, RI, <sup>3</sup>Dana Farber Cancer Institute, Boston, MA
- 2:45PM **OP-8-2-14F - Spatial Coordination of CD28 and CD3 Signaling in Mouse and Human Lymphocytes**  
K. Bashour<sup>1</sup>, J. Tsai<sup>1</sup>, K. Shen<sup>1,2</sup>, M. L. Dustin<sup>3</sup>, and L. C. Kam<sup>1</sup>  
<sup>1</sup>Columbia University, New York, NY, <sup>2</sup>Harvard University, Cambridge, MA, <sup>3</sup>New York University School of Medicine, New York, NY

Track: Tissue Engineering \* - 8-2-15

### **Cardiovascular Tissue Engineering - II**

Chairs: Lauren Black, Jeffrey Jacot

Ballroom F

\* Tissue Engineering Track sponsored by Kinetic Concepts, Inc.

- 1:30PM **OP-8-2-15A - Adipose-Derived Stromal Cell Homing and Recruitment in Angiogenesis in Inflamed Tissue**  
C. L. Mulvey<sup>1</sup>, P. J. Amos<sup>1</sup>, and S. Peirce-Cottler<sup>1</sup>  
<sup>1</sup>University of Virginia, Charlottesville, VA
- 1:45PM **OP-8-2-15B - Myocyte-Depleted Engineered Cardiac Tissues Support Therapeutic Potential of Mesenchymal Stem Cells**  
G. W. Serrao<sup>1</sup>, I. C. Turnbull<sup>1</sup>, D. Ancukiewicz<sup>1</sup>, Q. R. Youmans<sup>1</sup>, L. Hadri<sup>1</sup>, R. J. Hajjar<sup>1</sup>, and K. D. Costa<sup>1</sup>  
<sup>1</sup>Mount Sinai School of Medicine, New York, NY
- 2:00PM **OP-8-2-15C - Amniotic Fluid-derived Stem Cell Culture on Poly(ethylene glycol) Diacrylate Hydrogels**  
J. J. Petsche<sup>1</sup>, B. Gill<sup>1</sup>, M. Aliru<sup>1</sup>, J. L. West<sup>1</sup>, and J. G. Jacot<sup>1,2</sup>  
<sup>1</sup>Rice University, Houston, TX, <sup>2</sup>Texas Children's Hospital, Houston, TX
- 2:15PM **OP-8-2-15D - Viral Fusogens to Promote Stem Cell Reprogramming via Fusion**  
B. Freeman<sup>1</sup>, and B. Ogle<sup>1</sup>  
<sup>1</sup>University of Wisconsin-Madison, Madison, WI
- 2:30PM **OP-8-2-15E - Highly Extensible Hydrogels Capable of Differentiating Mesenchymal Stem Cells Into Cardiomyocytes**  
Z. Li<sup>1</sup>, and J. Guan<sup>2</sup>  
<sup>1</sup>The Ohio State University, Columbus, OH, <sup>2</sup>Ohio State University, Columbus, OH
- 2:45PM **OP-8-2-15F - Relative Impact of Cell Shape Versus ECM Ligand Identity on MSC Lineage Progression**  
P. Qu<sup>1</sup>, D. Munoz-Pinto<sup>1</sup>, and M. Hahn<sup>1</sup>  
<sup>1</sup>Texas A&M University, College Station, Tx

Track: Tissue Engineering \* - 8-2-16

### **Engineered Tissue Models for Drug Discovery**

Chairs: Deepak Nagrath, Laura Segatori

Ballroom G

\* Tissue Engineering Track sponsored by Kinetic Concepts, Inc.

- 1:30PM **OP-8-2-16A - Engineering Humanized Mice With Implantable Livers For Drug Development**  
A. A. Chen<sup>1,2</sup>, L. Ong<sup>1</sup>, and S. N. Bhatia<sup>1</sup>  
<sup>1</sup>Massachusetts Institute of Technology, Cambridge, MA, <sup>2</sup>Harvard University, Cambridge, MA
- 1:45PM **OP-8-2-16B - Detoxification Profiles in Three-Dimensional (3D) Liver Mimetic Cellular Architectures**  
Y. Kim<sup>1</sup>, and P. Rajagopalan<sup>1</sup>  
<sup>1</sup>Virginia Polytechnic Institute and State University, Blacksburg, VA
- 2:00PM **OP-8-2-16C - Engineering Microscale Liver Models for Drug Development**  
A. Moore<sup>1</sup>, S. Krzyzewski<sup>1</sup>, J. Gaffney<sup>1</sup>, S. McLean<sup>1</sup>, J. McGeehan<sup>1</sup>, and S. Khetani<sup>1</sup>  
<sup>1</sup>Hepregen Corporation, Medford, MA
- 2:15PM **OP-8-2-16D - Quantifying the Extent and Kinetics of Self-Assembly and Self-Sorting in 3D Micro-tissues**  
T-M. Ferruccio<sup>1</sup>, S. McCalla<sup>2</sup>, A. Tripathi<sup>1</sup>, and J. Morgan<sup>1</sup>  
<sup>1</sup>Brown University, Providence, RI, <sup>2</sup>Brown University, Providence, RI
- 2:30PM **OP-8-2-16E - A Novel *In Vitro* Microenvironment for Drug Delivery Particle Screening**  
B. Prabhakarandian<sup>1</sup>, J. Fewell<sup>2</sup>, K. Anwer<sup>2</sup>, and K. Pant<sup>1</sup>  
<sup>1</sup>CFD Research Corporation, Huntsville, AL, <sup>2</sup>EGEN Inc., Huntsville, AL
- 2:45PM **OP-8-2-16F - The Development of a 3D Tissue Engineered Bone Tumor Model**  
E. Burdett<sup>1</sup>, A. G. Mikos<sup>1</sup>, F. K. Kasper<sup>1</sup>, and J. A. Ludwig<sup>2</sup>  
<sup>1</sup>Rice University, Houston, TX, <sup>2</sup>University of Texas M.D. Anderson Cancer Center, Houston, TX

## **PLENARY SESSION - Distinguished Speakers Session**

4:00PM - 6:00PM

Ballroom D, Convention Center

### **Future Frontiers of Biomedical Engineering**

*“Engineering The Next Generation of Cancer Therapeutic Enzymes and Antibodies”*

**George Georgiou, Ph.D.**

*Cockrell Family Regents Chair in Engineering #9*

*Institute for Cell and Molecular Biology*

*Departments of Biomedical and Chemical Engineering*

*The University of Texas at Austin*

*“Bioengineering in Drug Discovery: Predictive Understanding of Cell Regulatory Network Operation”*

**Douglas Lauffenburger, Ph.D.**

*Ford Professor of Bioengineering and Head of the Department of Biological Engineering*

*Massachusetts Institute of Technology*

*“Stem Cells, Tissue Engineering, and Regenerative Medicine: Challenges Ahead”*

**Gordana Vunjak-Novakovic, Ph.D.**

*Professor and Director of the Laboratory for Stem Cells and Tissue Engineering Department of Biomedical Engineering , Columbia University*

*“Photoacoustic Tomography: Breaking Through the Optical Diffusion Limit”*

**Lihong Wang, Ph.D.**

*Gene K. Beare Distinguished Professor Department of Biomedical Engineering, Washington University in St. Louis*