

**THURSDAY, OCTOBER 7, 2010**

**PLATFORM SESSION - 7-1 - 10:30AM - 12:00PM**

Track: Tissue Engineering \* - 7-1-1

***Novel Biomaterials and Scaffolds - I***

Chairs: Adam Engler, Padma Rajagopalan

Room 12A

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

- 10:30AM **OP-7-1-1A - Engineering Cell Adhesive PEG Hydrogels by Michael Addition and Photopolymerization**  
D. R. Jones<sup>1</sup>, J. Zhu<sup>1</sup>, and R. E. Marchant<sup>1</sup>  
<sup>1</sup>Case Western Reserve University, Cleveland, OH
- 10:45AM **OP-7-1-1B - Radiation Crosslinked Polyurethane Shape-Memory Polymers with Tunable Mechanical Properties for Biomedical Device Applications**  
K. Hearon<sup>1</sup>, T. S. Wilson<sup>2</sup>, and D. J. Maitland<sup>1</sup>  
<sup>1</sup>Texas A&M University, College Station, TX, <sup>2</sup>Lawrence Livermore National Laboratory, Livermore, CA
- 11:00AM **OP-7-1-1C - New Biodegradable Fumerate and Maleate-Based Polymers for Bone Tissue Engineering**  
K. N. Cicotte<sup>1,2</sup>, S. M. Dirk<sup>1</sup>, and E. L. Hedberg-Dirk<sup>2</sup>  
<sup>1</sup>Sandia National Laboratories, Albuquerque, NM, <sup>2</sup>University of New Mexico, Albuquerque, NM
- 11:15AM **OP-7-1-1D - Evaluation of the Osteointegration Potential of a Biphasic Scaffold for Tendon-Bone Healing**  
X. Zhang<sup>1</sup>, K. L. Moffat<sup>1</sup>, X. S. Liu<sup>1</sup>, B. Zhou<sup>1</sup>, X. Guo<sup>1</sup>, and H. H. Lu<sup>1</sup>  
<sup>1</sup>Columbia University, New York, NY
- 11:30AM **OP-7-1-1E - Dual Scaffolding System For The Engineering Of Muscle-Tendon Junctions**  
M. R. Ladd<sup>1,2</sup>, S. Lee<sup>2</sup>, A. Atala<sup>2</sup>, and J. J. Yoo<sup>1,2</sup>  
<sup>1</sup>Wake Forest/Virginia Tech, Winston Salem, NC, <sup>2</sup>Wake Forest Institute for Regenerative Medicine, Winston Salem, NC
- 11:45AM **OP-7-1-1F - Surface Functionalization of Hydrogels by Polyelectrolyte Multilayer Films for Tissue Engineering**  
S. Yamanlar<sup>1,2</sup>, S. Sant<sup>1,2</sup>, and A. Khademhosseini<sup>1,2</sup>  
<sup>1</sup>Center for Biomedical Engineering, Brigham and Women's Hospital, Harvard Medical School, Cambridge, MA, <sup>2</sup>Harvard-MIT Division of Health Sciences and Technology, Massachusetts Institute of Technology, Cambridge, MA

Track: Biomedical Imaging and Optics - 7-1-2

***Molecular Imaging I - New Approaches and Technologies***

Chairs: Mark Borden, Jinyi Qi

Room 12B

- 10:30AM **OP-7-1-2A - Imaging the Inflammation-Driven Neurodegeneration Associated with Alzheimer's Disease**  
E. Andreozzi<sup>1</sup>, and A. Louie<sup>1</sup>  
<sup>1</sup>University of California, Davis, Davis, CA
- 10:45AM **OP-7-1-2B - Exploring the Benefit of Time-of-Flight PET**  
N. Cao<sup>1</sup>, R. H. Huesman<sup>2</sup>, W. W. Moses<sup>2</sup>, and J. Qi<sup>1</sup>  
<sup>1</sup>University of California at Davis, Davis, CA, <sup>2</sup>Lawrence Berkeley National Lab, Berkeley, CA

- 11:00AM **OP-7-1-2C - Syntheses and T1 Relaxivity of Block Copolymers Based Gadolinium Encapsulated Nanoparticles**  
S. Hou<sup>1</sup>, S. Tong<sup>1</sup>, and G. Bao<sup>1</sup>  
<sup>1</sup>Georgia Institute of Technology, Atlanta, GA
- 11:15AM **OP-7-1-2D - Lanthanide-doped SPIO Nanoparticles as a Non-Radiative, Multiplex Approach to Quantify Tumor Targeting**  
A. Elias<sup>1</sup>, and A. Tsourkas<sup>1</sup>  
<sup>1</sup>University of Pennsylvania, Philadelphia, PA
- 11:30AM **OP-7-1-2E - Ultrasound Molecular Imaging of  $\alpha_v\beta_3$  Integrin in Mouse Tumors**  
X. Hu<sup>1</sup>, C. Anderson<sup>2</sup>, J. Rychak<sup>2</sup>, and K. Ferrara<sup>1</sup>  
<sup>1</sup>University of California, Davis, Davis, CA, <sup>2</sup>Targeson, Inc, San Diego, CA
- 11:45AM **OP-7-1-2F - Bioorthogonal Chemistry Enhances Nanosensor Targeting to Cancer Cells**  
J. B. Haun<sup>1</sup>, N. K. Devaraj<sup>1</sup>, H. Lee<sup>1</sup>, and R. Weissleder<sup>1</sup>  
<sup>1</sup>Massachusetts General Hospital, Boston, MA

Track: Biomedical Imaging and Optics - 7-1-3

### **Imaging in Cancer Using Nanotechnology - I**

Chairs: Nichole Rylander, James Tunnell

Room 19A

- 10:30AM **OP-7-1-3A - An Intein-mediated Click Conjugation Strategy for Improved Targeting of Nanoparticle Systems**  
A. Elias<sup>1</sup>, and A. Tsourkas<sup>1</sup>  
<sup>1</sup>University of Pennsylvania, Philadelphia, PA
- 10:45AM **OP-7-1-3B - Synthesis of a Hybrid Plasmonic-Superparamagnetic Contrast Agent for Magneto-Photo-Acoustic Imaging**  
R. L. Truby<sup>1</sup>, K. A. Homan<sup>1</sup>, M. Qu<sup>1</sup>, M. Mehrmohammadi<sup>1</sup>, and S. Emelianov<sup>1</sup>  
<sup>1</sup>The University of Texas at Austin, Austin, TX
- 11:00AM **OP-7-1-3C - Imaging of Molecular Interactions Between Therapeutic Gold/Iron Nanoparticles and Lung Cancer Cells**  
J. O. Tam<sup>1</sup>, T. Yokoyama<sup>2</sup>, T. Larson<sup>1</sup>, A. Scott<sup>2</sup>, S. Kondo<sup>2</sup>, J. A. Roth<sup>2</sup>, R. Ramesh<sup>2</sup>, and K. V. Sokolov<sup>1</sup>  
<sup>1</sup>University of Texas at Austin, Austin, TX, <sup>2</sup>MD Anderson Cancer Center, Houston, TX
- 11:15AM **OP-7-1-3D - Tumor Imaging With a Multifunctional Targeted-Reporter Complex via Reporter Enzyme Complementation**  
A-M. Broome<sup>1</sup>, G. Ramamurthy<sup>1</sup>, K. Lavik<sup>1</sup>, L. A. Liggett<sup>1</sup>, and J. P. Basilion<sup>1</sup>  
<sup>1</sup>Case Western Reserve University, Cleveland, OH
- 11:30AM **OP-7-1-3E - Wide-Field Near-Infrared Narrow Band Imaging of Gold Nanoparticles' Distribution in Tumors**  
P. Puvanakrishnan<sup>1</sup>, J. Park<sup>1</sup>, P. Diagaradjane<sup>2</sup>, G. P. Goodrich<sup>3</sup>, S. Krishnan<sup>2</sup>, and J. W. Tunnell<sup>1</sup>  
<sup>1</sup>The University of Texas at Austin, Austin, TX, <sup>2</sup>The University of Texas M.D Anderson Cancer Center, Houston, TX, <sup>3</sup>Nanospectra Biosciences Inc, Houston, TX
- 11:45AM **OP-7-1-3F - Gold Nanoshells as Potential Contrast Agents for Rapid Intraoperative Breast Cancer Detection**  
L. R. Bickford<sup>1</sup>, and R. A. Drezek<sup>1</sup>  
<sup>1</sup>Rice University, Houston, TX

Track: Neural Engineering - 7-1-4

### **Brain-Computer Interfaces**

Chairs: Dan Moran, Patrick Wolf

Room 19B

- 10:30AM **OP-7-1-4A - Spinal Cord Recordings from Descending Motor Tracts Using Multi-Wires for Command Signal Generation**  
A. Prasad<sup>1</sup>, and M. Sahin<sup>1</sup>  
<sup>1</sup>New Jersey Institute of Technology, Newark, NJ

- 10:45AM **OP-7-1-4B - A Bidirectional Brain-Machine Interface with Motor Recordings and Sensory Microstimulation Feedback**  
J. E. O'Doherty<sup>1</sup>, P. J. Ifft<sup>1</sup>, K. Z. Zhuang<sup>1</sup>, M. A. Lebedev<sup>1</sup>, and M. A. Nicolelis<sup>1</sup>  
<sup>1</sup>Duke University, Durham, NC
- 11:00AM **OP-7-1-4C - Decoding Functional Intention Using Near-infrared Spectroscopy**  
T. Chau<sup>1,2</sup>, S. Power<sup>1</sup>, K. Tai<sup>2</sup>, S. Liddle<sup>3</sup>, and T. Falk<sup>2</sup>  
<sup>1</sup>University of Toronto, Toronto, Ontario, Canada, <sup>2</sup>Bloorview Research Institute, Toronto, Ontario, Canada, <sup>3</sup>Massachusetts General Hospital, Boston, MA
- 11:15AM **OP-7-1-4D - Toward Artificial Proprioception: Closing the Loop Through Cortical Stimulation**  
B. M. London<sup>1</sup>, R. Ruiz Torres<sup>1</sup>, and L. E. Miller<sup>1</sup>  
<sup>1</sup>Northwestern University, Chicago, IL
- 11:30AM **OP-7-1-4E - Optimizing Intracortical Microstimulation Via Asymmetric Pulses**  
A. Koivuniemi<sup>1</sup>, and K. Otto<sup>2</sup>  
<sup>1</sup>Purdue University, Indianapolis, IN, <sup>2</sup>Purdue University, West Lafayette, IN
- 11:45AM **OP-7-1-4F - A Model of the M1 Neuron During Movements of Fingers and the Wrist in Macaque Monkeys**  
S. Acharya<sup>1</sup>, M. H. Schieber<sup>2</sup>, and N. V. Thakor<sup>1</sup>  
<sup>1</sup>Johns Hopkins University, Baltimore, MD, <sup>2</sup>University of Rochester, Rochester, NY

Track: Cellular and Molecular Engineering - 7-1-5

### **Cellular and Subcellular Imaging**

Chairs: Kristen Carlson Maitland, Julie Ji

Room 18A

- 10:30AM **OP-7-1-5A - Parsing Stem Cell Behaviors in Complex Microenvironments via High Content Imaging and Modeling**  
E. Liu<sup>1</sup>, S. Vega<sup>1</sup>, S. Gordonov<sup>1</sup>, J. Kim<sup>1</sup>, and P. V. Moghe<sup>1</sup>  
<sup>1</sup>Rutgers University, Piscataway, NJ
- 10:45AM **OP-7-1-5B - Anisotropically Patterned Cardiac Tissue Displays Mature Ca<sup>2+</sup> Handling *In Vitro***  
H. Jin<sup>1</sup>, H. Lee<sup>1</sup>, B. Dabiri<sup>1</sup>, A. W. Feinberg<sup>1</sup>, and K. K. Parker<sup>1</sup>  
<sup>1</sup>Wyss Institute for Biologically Inspired Engineering, SEAS, Harvard University, Cambridge, MA
- 11:00AM **OP-7-1-5C - *In Situ* Analyses of mRNA Splicing via DNA Logic Gates**  
R. Schweller<sup>1</sup>, and M. Diehl<sup>1</sup>  
<sup>1</sup>Rice University, Houston, TX
- 11:15AM **OP-7-1-5D - Membrane Remodeling in the Footprint of Arrested Neutrophils Revealed Using DTIRF Microscopy**  
P. Sundd<sup>1</sup>, E. Gutierrez<sup>2</sup>, A. Groisman<sup>2</sup>, and K. Ley<sup>2,3</sup>  
<sup>1</sup>La Jolla Institute for Allergy and Immunology, La Jolla, CA, <sup>2</sup>University of California San Diego, La Jolla, CA, <sup>3</sup>La Jolla Institute for Allergy and Immunology, La Jolla, CA
- 11:30AM **OP-7-1-5E - Digitizing Cell Lineage and Morphogenesis With Spectral Two-Photon Microscopy**  
H. C. Gibbs<sup>1</sup>, A. C. Lekven<sup>1</sup>, and A. T. Yeh<sup>1</sup>  
<sup>1</sup>Texas A&M University, College Station, TX
- 11:45AM **OP-7-1-5F - Fabrication of Porous Silicon Nanobarcodes as Cellular Beacons**  
J. Fakhoury<sup>1,2</sup>, C. Chiappini<sup>1</sup>, A. Mack<sup>2</sup>, R. Serda<sup>2</sup>, X. Liu<sup>2</sup>, and M. Ferrari<sup>1,2</sup>  
<sup>1</sup>University of Texas at Austin, Austin, TX, <sup>2</sup>University of Texas Health Science Center - Houston, Houston, TX

**Cell Adhesion - I**

Chairs: Julie Ji, Benjamin Keselowsky

Room 18B

- 10:30AM **OP-7-1-6A - CD11c/CD18 Expression is Upregulated on Blood Monocytes During Hypertriglyceridemia and Enhances Adhesion to VCAM-1**  
R. M. Gower<sup>1</sup>, H. Wu<sup>2</sup>, C. M. Ballantyne<sup>2</sup>, A. A. Knowlton<sup>1</sup>, and S. I. Simon<sup>1</sup>  
<sup>1</sup>University of California Davis, Davis, CA, <sup>2</sup>Baylor College of Medicine, Houston, TX
- 10:45AM **OP-7-1-6B - Mutating FimH of *E. coli* to Allosterically Affect Catch-bond Behavior as a Force-activated Adhesive**  
V. B. Rodriguez<sup>1</sup>  
<sup>1</sup>University of Washington, Seattle, WA
- 11:00AM **OP-7-1-6C - Membrane Cholesterol and Ethanol Together Differentially Regulate Neutrophil Tethering and Rolling**  
M. Furlow<sup>1</sup>, and S. Diamond<sup>1</sup>  
<sup>1</sup>University of Pennsylvania, Philadelphia, PA
- 11:15AM **OP-7-1-6D - Neutrophil Shear-Induced Resistance to Activation via the Formyl Peptide Receptor**  
M. J. Mitchell<sup>1</sup>, and M. R. King<sup>1</sup>  
<sup>1</sup>Cornell University, Ithaca, NY
- 11:30AM **OP-7-1-6E - Determination Of Threshold Forces For Tether Formation In Vesicles**  
D. J. Stark<sup>1</sup>, T. C. Killian<sup>1</sup>, and R. M. Raphael<sup>1</sup>  
<sup>1</sup>Rice University, Houston, TX
- 11:45AM **OP-7-1-6F- Characterization of Selectin-mediated Cell Binding Using the Micropatterning Technology and Modeling**  
L. Cheung<sup>1</sup>, Z. Tong<sup>1</sup>, K. J. Stebe<sup>2</sup>, and K. Konstantopoulos<sup>1</sup>  
<sup>1</sup>Johns Hopkins University, Baltimore, MD, <sup>2</sup>University of Pennsylvania, Philadelphia, PA

**Innovations in Cardiovascular Bioengineering I: Cardiac**

Chairs: Nenad Bursac, Jeff Holmes

Room 18C

- 10:30AM **OP-7-1-7A - Morphomechanics of Embryonic Heart Tube Formation**  
V. D. Varner<sup>1</sup>, and L. A. Taber<sup>1</sup>  
<sup>1</sup>Washington University, Saint Louis, MO
- 10:45AM **OP-7-1-7B - Computational Modeling of Eccentric and Concentric Cardiac Growth through Sarcomerogenesis**  
S. Goktepe<sup>1</sup>, O. J. Abilez<sup>1</sup>, K. K. Parker<sup>2</sup>, and E. Kuhl<sup>1</sup>  
<sup>1</sup>Stanford University, Stanford, CA, <sup>2</sup>Harvard University, Cambridge, MA
- 11:00AM **OP-7-1-7C - Systems Analysis of the Cardiac Hypertrophy Signaling Network Using Automated Imaging**  
K. A. Ryall<sup>1</sup>, and J. J. Saucerman<sup>1</sup>  
<sup>1</sup>University of Virginia, Charlottesville, VA
- 11:15AM **OP-7-1-7D - Left Ventricular Wall Mechanics Improve During Endocardial Pacing In the Dyssynchronous Canine Heart**  
E. J. Howard<sup>1</sup>, J. W. Covell<sup>1</sup>, L. J. Mulligan<sup>2</sup>, A. D. McCulloch<sup>1</sup>, J. H. Omens<sup>1</sup>, and R. C. Kerckhoffs<sup>1</sup>  
<sup>1</sup>University of California, San Diego, La Jolla, CA, <sup>2</sup>Medtronic Inc., Mounds View, MN
- 11:30AM **OP-7-1-7E - Diffusion Tensor MRI Mapping of Two Local Myocardial Sheet Orientations with Histological Validation**  
G. L. Kung<sup>1</sup>, T. C. Nguyen<sup>2</sup>, A. Itoh<sup>2</sup>, S. Skare<sup>2</sup>, N. B. Ingels Jr.<sup>2</sup>, D. C. Miller<sup>2</sup>, and D. B. Ennis<sup>1</sup>  
<sup>1</sup>University of California, Los Angeles, CA, <sup>2</sup>Stanford University, Stanford, CA
- 11:45AM **OP-7-1-7F- Novel Papillary Muscle Force Transducer: Tests and Results**  
J. B. Askov<sup>1,2</sup>, J. L. Honge<sup>1</sup>, M. O. Jensen<sup>1,2</sup>, H. Nygaard<sup>1,2</sup>, J. M. Hasenkam<sup>1</sup>, and S. L. Nielsen<sup>1</sup>  
<sup>1</sup>Aarhus University Hospital, Aarhus N, Aarhus, Denmark, <sup>2</sup>Engineering College of Aarhus, Aarhus C, Aarhus, Denmark

Track: Cardiovascular Engineering - 7-1-8

### **Cardiovascular Fluid Dynamics - I**

Chairs: Alberto Aliseda, Wei Yin

Room 18D

- 10:30AM **OP-7-1-8A - A Hemodynamic Comparison at Intracranial Bifurcations with Different Propensities for Aneurysms**  
J. M. Alfano<sup>1</sup>, S. K. Natarajan<sup>1</sup>, and H. Meng<sup>1</sup>  
<sup>1</sup>State University of New York at Buffalo, Buffalo, NY
- 10:45AM **OP-7-1-8B - Relationship of E and A Wave Pressure Distribution to Diastolic Dysfunction**  
C. Niebel<sup>1</sup>, K. Stewart<sup>1</sup>, R. Kumar<sup>2</sup>, T. Ohara<sup>2</sup>, P. Vlachos<sup>1</sup>, and W. Little<sup>2</sup>  
<sup>1</sup>Virginia Tech, Blacksburg, VA, <sup>2</sup>Wake Forest University Baptist Medical Center, Winston Salem, NC
- 11:00AM **OP-7-1-8C - A New Insight into the Mechanism of Atrial Fibrillation Induced Endothelial Dysfunction: The Detrimental Effects of Irregular Shear Stress**  
N. Jen<sup>1</sup>, T. Hsiai<sup>1</sup>, and H. Mohamed<sup>2</sup>  
<sup>1</sup>University of Southern California, Los Angeles, CA, <sup>2</sup>University of Utah, Salt Lake City, UT
- 11:15AM **OP-7-1-8D - The Relationship Between Shear and Mass Transport in the Carotid Artery Bifurcation**  
R. Gorder<sup>1</sup>, and A. Aliseda<sup>1</sup>  
<sup>1</sup>University of Washington, Seattle, WA
- 11:30AM **OP-7-1-8E - Characterization of Pulsatile Flow in the Human Carotid Bifurcation with Age**  
W. Jeong<sup>1</sup>, and J. Seong<sup>1</sup>  
<sup>1</sup>University of Central Oklahoma, Edmond, OK
- 11:45AM **OP-7-1-8F - Pathological Shear Condition Alters Platelet Complement Activation**  
S. Shanmugavelayudam<sup>1</sup>, D. A. Rubenstein<sup>1</sup>, and W. Yin<sup>1</sup>  
<sup>1</sup>Oklahoma State University, Stillwater, OK

Track: Orthopedic and Rehabilitation Engineering - 7-1-9

### **Orthopedic Bioengineering & Imaging**

Chairs: Luis Cardoso, Yu Chen, Ron Mauck

Room 17A

- 10:30AM **OP-7-1-9A - An Ultrasonic Method for Determining the Mechanical Properties of Ovine Tibia under Cyclic Loading**  
L. Lin<sup>1</sup>, F. Serra-Hsu<sup>1</sup>, S. Ferreri<sup>1</sup>, J. Cheng<sup>1</sup>, and Y-X. Qin<sup>1</sup>  
<sup>1</sup>State University of New York at Stony Brook, Stony Brook, NY
- 10:45AM **OP-7-1-9B - Using Ultrasound Elastography to Characterize Aging Induced Muscle Degradation**  
M. J. Leineweber<sup>1</sup>, A. Cochran<sup>1</sup>, and Y. Gao<sup>1</sup>  
<sup>1</sup>Cornell University, Ithaca, NY
- 11:00AM **OP-7-1-9C - The Application of Micro-CT Arthrography in 3D Geometric Reconstruction of Soft and Hard Tissues in Small Animal Joint Model**  
X. I. Gu<sup>1</sup>, D. J. Leong<sup>1,2</sup>, N. Maldonado<sup>3</sup>, E. Williams<sup>3</sup>, H. B. Sun<sup>1,2</sup>, and L. Cardoso<sup>1</sup>  
<sup>1</sup>The Graduate Center and The City College of The City University of New York, New York, NY, <sup>2</sup>Mount Sinai School of Medicine, New York, NY, <sup>3</sup>City College of New York, New York, NY
- 11:15AM **OP-7-1-9AD- Local Delivery of Sphingosine 1-Phosphate Receptor-Specific Drugs Enhances Allograft Incorporation**  
C. S. Huang<sup>1</sup>, and E. A. Botchwey<sup>1</sup>  
<sup>1</sup>University of Virginia, Charlottesville, VA
- 11:30AM **OP-7-1-9E - Perineural Delivery of sTNFRII Attenuates Symptoms Associated with Lumbar Radiculopathy in the Rat**  
K. D. Allen<sup>1</sup>, M. F. Shamji<sup>2</sup>, B. A. Mata<sup>1</sup>, M. Gabr<sup>1</sup>, S. M. Sinclair<sup>1</sup>, P. Y. Hwang<sup>1</sup>, W. J. Richardson<sup>1</sup>, and L. A. Setton<sup>1</sup>  
<sup>1</sup>Duke University, Durham, NC, <sup>2</sup>Ottawa Hospital, Ottawa, Ontario, Canada

- 11:45AM **OP-7-1-FA - Response of Pain Receptors in the Midbrain due to Painful Radiculopathy**  
P. Y. Hwang<sup>1</sup>, M. F. Shamji<sup>2</sup>, L. Jing<sup>1</sup>, M. Gabr<sup>3</sup>, B. A. Mata<sup>3</sup>, K. D. Allen<sup>3</sup>, J. Chen<sup>1</sup>, W. J. Richardson<sup>3</sup>, and L. A. Setton<sup>1,3</sup>  
<sup>1</sup>Duke University Department of Biomedical Engineering, Durham, NC, <sup>2</sup>Division of Neurosurgery, Ottawa Hospital, Ottawa, ON, Canada, <sup>3</sup>Duke University Department of Orthopaedic Surgery, Durham, NC

Track: Systems Biology, Bioinformatics and Computational Biology - 7-1-10

**High-throughput Computational Biology**

Chairs: May Wang

Room 17B

- 10:30AM **OP-7-1-10A - Rewirable Gene Regulatory Networks in Mammalian Preimplantation Embryonic Development**  
D. Xie<sup>1</sup>, C-C. Chen<sup>1</sup>, L. Ptaszek<sup>2</sup>, S. Xiao<sup>1</sup>, X. Cao<sup>1</sup>, L. Harris<sup>1</sup>, C. Cowan<sup>2</sup>, and S. Zhong<sup>1</sup>  
<sup>1</sup>University of Illinois at Urbana-Champaign, Urbana, IL, <sup>2</sup>Massachusetts General Hospital, Boston, MA
- 10:45AM **OP-7-1-10B - Ablation of HSV-1 Replication by Drug Combinations Developed through Feedback System Control**  
X. Ding<sup>1</sup>, D. J. Sanchez<sup>1</sup>, A. Shahangian<sup>1</sup>, G. Cheng<sup>1</sup>, and C-M. Ho<sup>1</sup>  
<sup>1</sup>University of California, Los Angeles, Los Angeles, CA
- 11:00AM **OP-7-1-10C - Data-Driven Modeling Enhances Oncolytic Adenovirus Therapy**  
N. Bagheri<sup>1</sup>, M. Shiina<sup>2</sup>, W. M. Korn<sup>2</sup>, and D. Lauffenburger<sup>1</sup>  
<sup>1</sup>MIT, Cambridge, MA, <sup>2</sup>UCSF, San Francisco, CA
- 11:15AM **OP-7-1-10D - Adaptive Model Predictive Control of Human Promyelocytic Leukemia Cell Differentiation**  
S. L. Noble<sup>1</sup>, and A. E. Rundell<sup>1</sup>  
<sup>1</sup>Purdue University, West Lafayette, IN
- 11:30AM **OP-7-1-10E - Mutagenic HIV Promoter Library Uncovers Core Constitutive Transcription Factor Binding Sites That Modify Gene Expression Noise**  
K. Miller-Jensen<sup>1,2</sup>, and D. V. Schaffer<sup>2</sup>  
<sup>1</sup>Yale University, New Haven, CT, <sup>2</sup>UC Berkeley, Berkeley, CA
- 11:45AM **OP-7-1-10F - Measurements and Computational Modeling of Cerebrospinal Fluid Flow in Humans**  
B. J. Sweetman<sup>1</sup>, A. A. Linninger<sup>1</sup>, and R. Penn<sup>1</sup>  
<sup>1</sup>University of Illinois at Chicago, Chicago, IL

Track: AIMBE - 7-1-11

**AIMBE Session**

Room 16A

The pace of innovation, and the costs associated with getting approval for cutting edge biomedical engineering advancements in pharmaceuticals and medical devices, can pose a threat to American innovation. AIMBE will host a panel discussing the federal policies that impact innovation and how innovation affects the livelihood of the American population and economy. Panelists will discuss the need for transformative policies to overcome barriers to innovation. Panelists will include industry, researchers, and representatives of patients in need of cutting edge treatments.

The purpose of this panel is to communicate the following goals:

1. Highlight the role that biomedical innovation plays in improving the quality of life and wellbeing of patients, as well as strengthening the economy.
2. Identify federal policies aimed at improving the pace of innovation, and discuss how those policies were developed, and how inputs from advocates helped to advance policies forward.
3. Discuss the role that biomedical engineers can play in improving the pace of innovation, specifically in the expanding field of regulatory science.
4. Provide an industry perspective on barriers to innovation, and solutions identify by industry to overcome barriers.
5. Raise awareness of AIMBE's role as leading advocacy organization for the field of biomedical engineering.

**Biomems and Nanotech for Cellular Engineering**

Chairs: Xuanhong Chen, Tejal Desai

Room 16B

- 10:30AM **OP-7-1-12A - Detecting Cell-Adhesive Sites in Extracellular Matrix using Force Spectroscopy Mapping**  
S. Chirasatsitsin<sup>1</sup>, and A. J. Engler<sup>1</sup>  
<sup>1</sup>University of California, San Diego, La Jolla, CA
- 10:45AM **OP-7-1-12B - Oxygen Gradients for Open Well Cellular Cultures via Microfluidic Substrates**  
J. Lo<sup>1</sup>, and D. T. Eddington<sup>1</sup>  
<sup>1</sup>University of Illinois, Chicago, IL
- 11:00AM **OP-7-1-12C - Patterning Cells Over Diamond-Like Carbon Electrochemical Electrodes Using Parylene C Microwells**  
J. Yao<sup>1,2</sup>, C. J. Mathai<sup>1</sup>, S. Gangopadhyay<sup>1</sup>, and K. D. Gillis<sup>1,2</sup>  
<sup>1</sup>University of Missouri, Columbia, MO, <sup>2</sup>Dalton Cardiovascular Research Center, Columbia, MO
- 11:15AM **OP-7-1-12D - Real-time Live Cell Array for Monitoring Gene Expression in Mesenchymal Stem Cell Differentiation**  
P. Lei<sup>1</sup>, J. Tian<sup>1</sup>, J. Moharil<sup>1</sup>, P. Xu<sup>1</sup>, C. P. Schaffer<sup>1</sup>, and S. T. Andreadis<sup>1,2</sup>  
<sup>1</sup>University at Buffalo-SUNY, Amherst, NY, <sup>2</sup>Center of Excellence in Bioinformatics and Life Sciences, Buffalo, NY
- 11:30AM **OP-7-1-12E - A Single Cell Trapping Microarray and Automated Tracking of Clonal Expansion**  
A. J. Rettie<sup>1</sup>, T. Chang<sup>1</sup>, W. C. Watt<sup>1</sup>, and A. Folch<sup>1</sup>  
<sup>1</sup>University of Washington, Seattle, WA
- 11:45AM **OP-7-1-12F - Identification of Angiogenic Factors through Reconfigurable Co-Cultures**  
M. Y. Kim<sup>1</sup>, A. C. Newman<sup>1</sup>, K. M. Spencer<sup>1</sup>, P. H. Chao<sup>1</sup>, K. L. Dooley<sup>1</sup>, C. C. Hughes<sup>1</sup>, and E. E. Hui<sup>1</sup>  
<sup>1</sup>University of California, Irvine, Irvine, CA

**Nucleic Acid Delivery - I**

Chairs: Michelle Dawson, Craig Duvall

\* Drug Delivery Systems Track is sponsored by Acta Biomaterialia - Room 14

- 10:30AM **OP-7-1-13A - Mediators of Intracellular Trafficking Enhance Transgene Expression Efficacy of Polymer-Plasmid DNA Complexes**  
S. Barua<sup>1</sup>, J. Ramos<sup>1</sup>, J. Lehrman<sup>1</sup>, and K. Rege<sup>1</sup>  
<sup>1</sup>Arizona State University, Tempe, AZ
- 10:45AM **OP-7-1-13B - Intracellular Transport of Linear-Dendritic Block Copolymer DNA Polyplexes: Characterization and Modulation**  
D. Bonner<sup>1</sup>, C. Leung<sup>1</sup>, R. Langer<sup>1</sup>, and P. Hammond<sup>1</sup>  
<sup>1</sup>MIT, Cambridge, MA
- 11:00AM **OP-7-1-13C - Self-Assembling DNA Nanostructures: Novel Carriers for Drug Delivery**  
H. Li<sup>1</sup>, Y-P. Ho<sup>1</sup>, T. LaBean<sup>2</sup>, and K. Leong<sup>1</sup>  
<sup>1</sup>Department of Biomedical Engineering, Duke University, Durham, NC, <sup>2</sup>Department of Chemistry, Duke University, Durham, NC
- 11:15AM **OP-7-1-13D - Novel Polymeric Nanoparticles as Gene Delivery Vectors for Treatment of Cystic Fibrosis**  
R. J. Fields<sup>1</sup>, C. Cheng<sup>1</sup>, C. Hoimes<sup>1</sup>, T. Patel<sup>1</sup>, M. Egan<sup>1</sup>, and W. M. Saltzman<sup>1</sup>  
<sup>1</sup>Yale University, New Haven, CT
- 11:30AM **OP-7-1-13E - Fibrin-conjugated VSV-g pseudotyped lentiviruses for localized gene delivery and live cell microarray applications**  
R. M. Padmashali<sup>1</sup>, and S. Andreadis<sup>1</sup>  
<sup>1</sup>University of Buffalo, Buffalo, NY
- 11:45AM **OP-7-1-13F - Directed Evolution Yields Novel Adeno-Associated Virus Variants that Cross the Blood-Brain Barrier**  
J. M. Bergen<sup>1</sup>, and D. V. Schaffer<sup>1</sup>  
<sup>1</sup>UC Berkeley, Berkeley, CA

**Immunobioengineering - I**

Chairs: George Georgiou, Jennifer Maynard

Room 15

- 10:30AM **OP-7-1-14A - Rapid Generation of Monoclonal Antibodies Without Screening by Exploiting High-throughput DNA Sequencing of Immunized Repertoires**  
S. T. Reddy<sup>1</sup>, X. Ge<sup>1</sup>, and G. Georgiou<sup>1</sup>  
<sup>1</sup>University of Texas Austin, Austin, TX
- 10:45AM **OP-7-1-14B - Palmitoylation Regulates Raft Affinity for the Majority of Cell Surface Proteins**  
I. Levental<sup>1</sup>, D. Lingwood<sup>1</sup>, and K. Simons<sup>1</sup>  
<sup>1</sup>Max Planck Institute for Cell Biology and Genetics, Dresden, Germany
- 11:00AM **OP-7-1-14C - Designing Synthetic, Modular Peptide Antigen Delivery Systems Using Self-Assembling Peptide Amphiphiles**  
A. Trent<sup>1</sup>, M. Black<sup>1</sup>, and M. Tirrell<sup>2</sup>  
<sup>1</sup>University of California, Santa Barbara, Berkeley, CA, <sup>2</sup>University of California, Berkeley, Berkeley, CA
- 11:15AM **OP-7-1-14D - High-Throughput Sequencing: Antibody Repertoire Development in Zebrafish**  
N. Jiang<sup>1</sup>, J. Weinstein<sup>1</sup>, L. Penland<sup>1</sup>, R. White III<sup>1</sup>, D. Fisher<sup>1</sup>, and S. Quake<sup>1</sup>  
<sup>1</sup>Stanford University, Stanford, CA
- 11:30AM **OP-7-1-14E - Controlled Antigen Release in Mucosa for Oral Vaccination**  
T. A. Khan<sup>1</sup>, and J. A. Maynard<sup>1</sup>  
<sup>1</sup>The University of Texas at Austin, Austin, TX
- 11:45AM **OP-7-1-14F - Novel Methods for the Discovery of Highly Potent Therapeutic Antibodies**  
X. Ge<sup>1</sup>, and G. Georgiou<sup>1</sup>  
<sup>1</sup>University of Texas, Austin, TX

**Nano- and Micro-Engineering in Tissue Engineering - I**

Chairs: Ketul Popat, Jessica Winter

Ballroom E

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

- 10:30AM **OP-7-1-15A - Multivalent Ephrin-B2 Bioconjugates Enhance Neuronal Differentiation of Neural Stem Cells**  
A. Conway<sup>1</sup>, R. Ashton<sup>1</sup>, and D. V. Schaffer<sup>1</sup>  
<sup>1</sup>University of California, Berkeley, Berkeley, CA
- 10:45AM **OP-7-1-15B - Multivalency Enhances the Potency of Sonic Hedgehog in Dopaminergic Differentiation of hESCs**  
R. S. Ashton<sup>1</sup>, J. Pollock<sup>1</sup>, K. Healy<sup>1</sup>, R. S. Kane<sup>2</sup>, and D. V. Schaffer<sup>1</sup>  
<sup>1</sup>University of California Berkeley, Berkeley, CA, <sup>2</sup>Rensselaer Polytechnic Institute, Troy, NY
- 11:00AM **OP-7-1-15C - Bioactive and Protein-like Synthetic Nanostructures From Peptide Amphiphiles**  
W. Suh<sup>1</sup>, G. D. Stucky<sup>2</sup>, and M. V. Tirrell<sup>1</sup>  
<sup>1</sup>University of California, Berkeley, Berkeley, CA, <sup>2</sup>University of California, Santa Barbara, Santa Barbara, CA
- 11:15AM **OP-7-1-15D - Synergistic Effect of Anisotropic Adhesive Cues on Neurite Outgrowth**  
S. N. Masand<sup>1</sup>, H. Sundararaghavan<sup>2</sup>, and D. Shreiber<sup>1</sup>  
<sup>1</sup>Rutgers, The State University of New Jersey, Piscataway, NJ, <sup>2</sup>The University of Pennsylvania, Philadelphia, PA
- 11:30AM **OP-7-1-15E - Guided Assembly of Insulin-Expressing Islet-Like Cell Clusters on Polymeric Micro/Nanowells**  
D. Gallego-Perez<sup>1</sup>, N. Higuera-Castro<sup>1</sup>, R. Reen<sup>1</sup>, M. Palacio-Ochoa<sup>1,2</sup>, S. Sharma<sup>1</sup>, L. Lee<sup>1</sup>, J. Lannutti<sup>1</sup>, D. Hansford<sup>1</sup>, and K. Gooch<sup>1</sup>  
<sup>1</sup>The Ohio State University, Columbus, OH, <sup>2</sup>Antioquia School of Engineering, Envigado, Antioquia, Colombia
- 11:45AM **OP-7-1-15F - Optimization of Nano-scale Perfluorocarbon Emulsions for use in Cellular Encapsulation**  
C. Fraker<sup>1</sup>, and C. L. Stabler<sup>1</sup>  
<sup>1</sup>University of Miami, Miami, FL

Track: Tissue Engineering \* - 7-1-16

### **Neural Tissue Engineering - I**

Chairs: Kacy Cullen, Jennie Leach

Ballroom F

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

- 10:30AM **OP-7-1-16A - Attention to Materials and Pore Structure Leads to Regeneration of Dura Mater**  
P. B. Snowhill<sup>1</sup>, R. D. Hubbard<sup>1</sup>, P. K. Alkema<sup>1</sup>, and G. J. Pomrinck<sup>1</sup>  
<sup>1</sup>Integra LifeSciences, Plainsboro, NJ
- 10:45AM **OP-7-1-16AB - Glycomimetic Functionalized Scaffolds for Peripheral Nerve Regeneration**  
S. N. Masand<sup>1</sup>, B. Hammerling<sup>1</sup>, I. Perron<sup>2</sup>, J. Chen<sup>1</sup>, M. Schachner<sup>1</sup>, and D. Shreiber<sup>1</sup>  
<sup>1</sup>Rutgers, The State University of New Jersey, Piscataway, NJ, <sup>2</sup>Rutgers, The State University of New Jersey, Philadelphia, NJ
- 11:00AM **OP-7-1-16C - Injection of Schwann Cells into Acellular Cold-Preserved Nerve Grafts to Enhance Nerve Regeneration**  
N. Jesuraj<sup>1</sup>, K. Santosa<sup>2</sup>, M. MacEwan<sup>1,2</sup>, A. Moore<sup>2</sup>, R. Kasukurthi<sup>2</sup>, W. Ray<sup>2</sup>, E. Flagg<sup>2</sup>, D. Hunter<sup>2</sup>, G. Borschel<sup>2,3</sup>, P. Johnson<sup>2</sup>, S. MacKinnon<sup>2</sup>, and S. Sakiyama-Elbert<sup>1</sup>  
<sup>1</sup>Washington University in St. Louis, St. Louis, MO, <sup>2</sup>Washington University School of Medicine, St. Louis, MO, <sup>3</sup>University of Toronto, Toronto, Ontario, Canada
- 11:15AM **OP-7-1-16AD- Hydrolytically Degradable Poly(ethylene glycol) Hydrogel as a Tunable Scaffold for Neural Tissue Engineering**  
S. P. Zustiak<sup>1</sup>, and J. B. Leach<sup>1</sup>  
<sup>1</sup>UMBC, Chemical & Biochemical Engineering, Baltimore, MD
- 11:30AM **OP-7-1-16E - Hyaluronic Acid Scaffolds for Repair Strategies after Cervical Spinal Cord Injury**  
Z. Z. Khaing<sup>1</sup>, S. Geissler<sup>1</sup>, S. V. Aguilar<sup>1</sup>, T. Schallert<sup>1</sup>, and C. E. Schmidt<sup>1</sup>  
<sup>1</sup>UT Austin, Austin, TX
- 11:45AM **OP-7-1-16F - Mouse Embryonic Stem Cell-derived Progenitor Motor Neurons for Transplantation After Spinal Cord Injury**  
D. McCreedy<sup>1</sup>, and S. Sakiyama-Elbert<sup>1</sup>  
<sup>1</sup>Washington University in St. Louis, St. Louis, MO

Track: Tissue Engineering \* - 7-1-17

### **Musculoskeletal Tissue Engineering - I**

Chairs: Jeffrey Jacot, Johnna Temenoff

Ballroom G

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

- 10:30AM **OP-7-1-17A - Co-regulation of Tendon and Muscle Progenitor Cells Via Paracrine Signaling in a 3D Culture System**  
A. H. Thomas<sup>1</sup>, A. G. Burbank<sup>1</sup>, and C. K. Kuo<sup>1</sup>  
<sup>1</sup>Tufts University, Medford, MA
- 10:45AM **OP-7-1-17B - Selective Activation of Phospholipid Receptors Affects Progenitor Cell Recruitment**  
M. R. Tinius<sup>1</sup>, and E. A. Botchwey<sup>1</sup>  
<sup>1</sup>University of Virginia, Charlottesville, VA
- 11:00AM **OP-7-1-17C - Bone Marrow Stromal Cell Recruitment Enhances Local S1P Receptor-Initiated Vascular Remodeling**  
A. O. Awojoodu<sup>1</sup>, L. S. Sefcik<sup>1</sup>, B. R. Wamhoff<sup>2</sup>, S. M. Peirce-Cottler<sup>1</sup>, and E. A. Botchwey<sup>1</sup>  
<sup>1</sup>University of Virginia - Department of Biomedical Engineering, Charlottesville, VA, <sup>2</sup>University of Virginia - Department of Cardiovascular Medicine, Charlottesville, VA
- 11:15AM **OP-7-1-17D - Comparison of C2C12 Myoblast Line and Primary Human Skeletal Myoblasts for Muscle Tissue-Engineering**  
C. S. Cheng<sup>1</sup>, R. Harbuck<sup>1</sup>, Y. El-Abd<sup>1</sup>, W. E. Kraus<sup>2</sup>, and G. A. Truskey<sup>1</sup>  
<sup>1</sup>Duke University, Durham, NC, <sup>2</sup>Duke University Medical Center, Durham, NC
- 11:30AM **OP-7-1-17E - Contractile Force of Engineered Skeletal Muscle Depends on Myofiber Density and Local Alignment**  
W. Bian<sup>1</sup>, and N. Bursac<sup>1</sup>  
<sup>1</sup>Duke University, Durham, NC

11:45AM **OP-7-1-17F - Functional Restoration of Skeletal Muscle Defects Using Bioengineered Skeletal Muscle in Rodents**  
M. Machingal<sup>1,2</sup>, B. T. Corona<sup>1</sup>, V. Kesireddy<sup>1</sup>, W. Zhao<sup>1</sup>, J. J. Yoo<sup>1</sup>, and G. J. Christ<sup>1</sup>  
<sup>1</sup>Wake Forest Institute for Regenerative Medicine, Winston Salem, NC, <sup>2</sup>VT-WFU School of Biomedical Engineering and Sciences, Winston Salem, NC

## PLATFORM SESSION - 7-2 - 1:30PM - 3:00PM

Track: Tissue Engineering \* - 7-2-1

### **Novel Biomaterials and Scaffolds - II**

Chairs: Jason Burdick, Seda Kizilel

Room 12A

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

- 1:30PM **OP-7-2-1A - Cellular Behavior on a Novel Continuously Graded Scaffold That Mimics an Orthopaedic Interface**  
S. Samavedi<sup>1</sup>, A. S. Goldstein<sup>1</sup>, S. A. Guelcher<sup>2</sup>, and A. W. Morgan<sup>1</sup>  
<sup>1</sup>Virginia Polytechnic Institute & State University, Blacksburg, VA, <sup>2</sup>Vanderbilt University, Nashville, TN
- 1:45PM **OP-7-2-1B - Electrospun Scaffolds with Depth-wise Chemical and Mechanical Gradients to Increase Cell Infiltration**  
H. G. Sundararaghavan<sup>1</sup>, and J. A. Burdick<sup>1</sup>  
<sup>1</sup>University of Pennsylvania, Philadelphia, PA
- 2:00PM **OP-7-2-1C - Oxygen Generating Biomaterials for Ischemic Tissue Salvage and Function**  
C. L. Ward<sup>1,2</sup>, B. T. Corona<sup>1</sup>, J. J. Yoo<sup>1</sup>, B. S. Harrison<sup>1,2</sup>, and G. J. Christ<sup>1,2</sup>  
<sup>1</sup>Wake Forest University Health Sciences, Winston-Salem, NC, <sup>2</sup>School of Biomedical Engineering and Sciences, Winston-Salem, NC
- 2:15PM **OP-7-2-1D - Development of Fully Biodegradable Polymeric "Quantum Dots"**  
Y. Zhang<sup>1</sup>, R. Tran<sup>1</sup>, D. Gyawali<sup>1</sup>, and J. Yang<sup>1</sup>  
<sup>1</sup>University of Texas at Arlington, Arlington, TX
- 2:30PM **OP-7-2-1E - Ruthenium Catalyzed Cross-Linking of Engineered Arterial Tissue**  
J. W. Bjork<sup>1</sup>, and R. T. Tranquillo<sup>1</sup>  
<sup>1</sup>University of Minnesota, Minneapolis, MN
- 2:45PM **OP-7-2-1F - Development of Synthetic Viruses for Tissue Regenerating Materials**  
S-W. Lee<sup>1,2</sup>, W. Chung<sup>1</sup>, and S. Yoo<sup>1</sup>  
<sup>1</sup>University of California, Berkeley, Berkeley, CA, <sup>2</sup>Lawrence Berkeley National Laboratory, Berkeley, CA

Track: Biomedical Imaging and Optics - 7-2-2

### **Molecular Imaging II - Synthesis and In Vitro Imaging**

Chairs: Anne Marie Broom, Andrew Tsourkas

Room 12B

- 1:30PM **OP-7-2-2A - A Genetically Engineered Ratiometric Bioluminescent Sensor for Oxidative Stress**  
J. Czupryna<sup>1</sup>, and A. Tsourkas<sup>1</sup>  
<sup>1</sup>University of Pennsylvania, Philadelphia, PA
- 1:45PM **OP-7-2-2B- Ratiometric BiMolecular Beacons for the Sensitive Detection of RNA in Single Living Cells**  
X. Zhang<sup>1</sup>, A. K. Chen<sup>1</sup>, A. Shah<sup>1</sup>, M. A. Behlke<sup>2</sup>, and A. Tsourkas<sup>1</sup>  
<sup>1</sup>University of Pennsylvania, Philadelphia, PA, <sup>2</sup>Integrated DNA Technologies, Inc., Coralville, IA
- 2:00PM **OP-7-2-2C - A Novel Fluorogenic Probe for Imaging Endogenous Proteins in Living Cells**  
S. Dublin<sup>1</sup>, Y. Zhang<sup>1</sup>, Z. Zheng<sup>1</sup>, and G. Bao<sup>1</sup>  
<sup>1</sup>Georgia Institute of Technology, Atlanta, GA

- 2:15PM **OP-7-2-2D - Design of Reactive Fluorogenic Probes for Imaging Small Molecules**  
N. K. Devaraj<sup>1</sup>, S. Hilderbrand<sup>1</sup>, and R. Weissleder<sup>1</sup>  
<sup>1</sup>Massachusetts General Hospital, Boston, MA
- 2:30PM **OP-7-2-2E - Imaging Multiple Fluorophore Lifetimes with Diffuse Optical Tomography**  
R. Nothdurft<sup>1</sup>, M. Berezin<sup>1</sup>, S. Achilefu<sup>1</sup>, and J. Culver<sup>1</sup>  
<sup>1</sup>Washington University School of Medicine, St. Louis, MO
- 2:45PM **OP-7-2-2F - Static SIMS Imaging Identification of Individual Cells in Mixed Phenotype Cultures**  
C. A. Barnes<sup>1</sup>, J. Brison<sup>1</sup>, D. G. Castner<sup>1</sup>, and B. D. Ratner<sup>1</sup>  
<sup>1</sup>University of Washington, Seattle, WA

Track: Biomedical Imaging and Optics - 7-2-3

### **Imaging in Cancer Using Nanotechnology - II**

Chairs: Bahram Anvari, James Basilion

Room 19A

- 1:30PM **OP-7-2-3A - MRI Tracking of Intracellular Delivery of Tumor-Targeting Nanoparticles Triggered by Molecular Interactions With ICAM-1**  
R. Wong<sup>1,2</sup>, X. Chen<sup>1</sup>, T. Liu<sup>1,2</sup>, Y. A. Yang<sup>3</sup>, Y. Wang<sup>1,2</sup>, and M. M. Jin<sup>1,2</sup>  
<sup>1</sup>Cornell University, Ithaca, NY, <sup>2</sup>Cornell University - Weill Medical College, New York, NY, <sup>3</sup>Ocean Nanotech, LLC, Springdale, AR
- 1:45PM **OP-7-2-3B - Ultrasonic Evaluation of Tumor Response to VEGF Blockade using Size-Selected Microbubbles**  
S. R. Sirsi<sup>1</sup>, C. C. Chen<sup>1</sup>, S. L. Hernandez<sup>2</sup>, J. Huang<sup>2</sup>, T. B. Johung<sup>2</sup>, D. J. Yamashiro<sup>2</sup>, J. J. Kandel<sup>2</sup>, S. Homma<sup>2</sup>, and M. A. Borden<sup>2</sup>  
<sup>1</sup>Columbia University, New York, NY, <sup>2</sup>Columbia University Medical Center, New York, NY
- 2:00PM **OP-7-2-3C - An Iodinated Nanoparticle Contrast Agent for Evaluating the Efficacy of Nano-Therapeutics**  
K. B. Ghaghada<sup>1</sup>, R. Bhavane<sup>1</sup>, M. Srivastava<sup>1</sup>, G. Espinosa<sup>1</sup>, and A. Annapragada<sup>1</sup>  
<sup>1</sup>The University of Texas Health Science Center, Houston, TX
- 2:15PM **OP-7-2-3D -Development of Cancer Enzyme Triggered Fluorescent Nano-Contrast Agent**  
J. Wang<sup>1</sup>, S. Biswas<sup>1</sup>, M. Nantz<sup>1</sup>, S. Achilefu<sup>2</sup>, and K. A. Kang<sup>1</sup>  
<sup>1</sup>University of Louisville, Louisville, KY, <sup>2</sup>Washington University, St. Louis, MO
- 2:30PM **OP-7-2-3E - In Vitro Optical Imaging of HeLa Cancer Cells with BSA-coated Polymeric Nanocapsules Containing ICG**  
B. Jung<sup>1</sup>, and B. Anvari<sup>1</sup>  
<sup>1</sup>University of California, Riverside, Riverside, CA
- 2:45PM **OP-7-2-3F - Mesoporous Silicon Magnetic Nanoconstructs as superior MRI Contrast Agents**  
R. Sethi<sup>1</sup>, J. Ananta<sup>1</sup>, X. Liu<sup>2</sup>, J. Bankson<sup>3</sup>, M. Ferrari<sup>2</sup>, L. Wilson<sup>1</sup>, and P. Decuzzi<sup>2</sup>  
<sup>1</sup>Rice University, Houston, TX, <sup>2</sup>University of Texas - HSCH, Houston, TX, <sup>3</sup>MD Anderson Cancer Center, Houston, TX

Track: Neural Engineering - 7-2-4

### **Motor Neural Prosthetics**

Chairs: Kenneth Gustafson, Paul Yoo

Room 19B

- 1:30PM **OP-7-2-4A - A Neuroprosthesis for Restoring Arm and Hand Function in Individuals with C1-C4 Spinal Cord Injury**  
R. Kirsch<sup>1</sup>  
<sup>1</sup>Case Western Reserve University, Cleveland, OH
- 1:45PM **OP-7-2-4B - Decoding Simple Grasp Movements from the Human Subdural Electroocorticogram**  
S. Acharya<sup>1</sup>, M. S. Fifer<sup>1</sup>, H. L. Benz<sup>1</sup>, N. E. Crone<sup>1</sup>, and N. V. Thakor<sup>1</sup>  
<sup>1</sup>Johns Hopkins University, Baltimore, MD
- 2:00PM **OP-7-2-4C - The Target Achievement Control Test: Evaluating real-time myoelectric pattern recognition control**  
A. M. Simon<sup>1</sup>, L. J. Hargrove<sup>1,2</sup>, B. A. Lock<sup>1</sup>, and T. A. Kuiken<sup>1,2</sup>  
<sup>1</sup>Rehabilitation Institute of Chicago, Chicago, IL, <sup>2</sup>Northwestern University, Chicago, IL

- 2:15PM **OP-7-2-4D - Peripheral Nerve Electrodes in Clinical Applications**  
D. J. Tyler<sup>1</sup>  
<sup>1</sup>Case Western Reserve University, Cleveland, OH
- 2:30PM **OP-7-2-4E - Differential Activity of Pudendal Nerve Afferents During Micturition**  
P. B. Yoo<sup>1</sup>, and W. M. Grill<sup>1</sup>  
<sup>1</sup>Duke University, Durham, NC
- 2:45PM **OP-7-2-4F - Functional Stimulation of Peripheral Motor Axons Via Neuroregenerative Sieve Microelectrodes**  
M. R. MacEwan<sup>1</sup>, E. Zellmer<sup>1</sup>, D. Siewe<sup>1</sup>, J. Wheeler<sup>1</sup>, S. Sakiyama-Elbert<sup>1</sup>, and D. Moran<sup>1</sup>  
<sup>1</sup>Washington University, Saint Louis, MO

Track: Cellular and Molecular Engineering - 7-2-5

### ***Molecular Engineering - I***

Chairs: Helim Aranda-Espinoza , Laura Segatori  
Room 18A

- 1:30PM **OP-7-2-5A - Characterization and Informed Design of Downregulating Epidermal Growth Factor Receptor Antibodies**  
J. B. Spangler<sup>1</sup>, and K. D. Wittrup<sup>1</sup>  
<sup>1</sup>Massachusetts Institute of Technology, Cambridge, MA
- 1:45PM **OP-7-2-5B - Engineering Human Arginase as a Novel Chemotherapeutic Agent for the Treatment of Hepatocellular Carcinoma**  
E. Stone<sup>1</sup>, L. Chantranupong<sup>1</sup>, C. Gonzales<sup>1</sup>, and G. Georgiou<sup>1</sup>  
<sup>1</sup>University of Texas at Austin, Austin, TX
- 2:00PM **OP-7-2-5C - Investigating the Aggregation, Structure, and Activity of DNA Binding bZip Peptide Amphiphiles**  
R. Marullo<sup>1</sup>, and M. Tirrell<sup>2</sup>  
<sup>1</sup>University of California, Santa Barbara, Berkeley, CA, <sup>2</sup>University of California, Berkeley, Berkeley, CA
- 2:15PM **OP-7-2-5D - Engineering High Affinity Knottin Peptides Targeting Tumor Marker CAIX for Cancer Imaging**  
S. J. Moore<sup>1</sup>, and J. R. Cochran<sup>1</sup>  
<sup>1</sup>Stanford University, Stanford, CA
- 2:30PM **OP-7-2-5E - Modification of Adeno-Associated Virus Capsid Conformational Change Behavior Using Error-Prone PCR**  
M. A. Musick<sup>1,2</sup>, K. I. McConnell<sup>1</sup>, C. Chen<sup>1</sup>, and J. Suh<sup>1</sup>  
<sup>1</sup>Rice University, Houston, TX, <sup>2</sup>Baylor College of Medicine, Houston, TX
- 2:45PM **OP-7-2-5F - Micropatterning of Aptamer Beacons to Create Cytokine-Sensing Surfaces**  
N. Tuleuova<sup>1,2</sup>, J. Seo<sup>1</sup>, E. Ramanculov<sup>2</sup>, and A. Revzin<sup>1</sup>  
<sup>1</sup>University of California, Davis, CA, <sup>2</sup>National Center for Biotechnology, Astana, Kazakhstan

Track: Cellular and Molecular Engineering - 7-2-6

### ***Cell Mechanics***

Chairs: William Hancock , David Odde  
Room 18B

- 1:30PM **OP-7-2-6A - Adipose Progenitor Cells Promote Mammary Tumor Stiffness by Altering Fibronectin Mechanics**  
E. M. Chandler<sup>1</sup>, M. Saunders<sup>1</sup>, D. Gourdon<sup>1</sup>, and C. Fischbach<sup>1</sup>  
<sup>1</sup>Cornell University, Ithaca, NY
- 1:45PM **OP-7-2-6B - Cytoskeletal Fluidization Potentiates cell Realignment during Uniaxial Cyclic Cell Stretching**  
A. L. Jordan<sup>1</sup>, R. Krishnan<sup>2</sup>, N. Mizrahi<sup>2</sup>, K. Rajendran<sup>2</sup>, A. Marinkovic<sup>2</sup>, J. P. Butler<sup>2</sup>, J. J. Fredberg<sup>2</sup>, and D. Stamenovic<sup>1</sup>  
<sup>1</sup>Boston University, Boston, MA, <sup>2</sup>Harvard School of Public Health, Boston, MA
- 2:00PM **OP-7-2-6C - Effect of DDR Receptors on Mechanical Properties of Extracellular Matrix**  
S. M. Tabbaa<sup>1</sup>, A. Blissett<sup>1</sup>, L. Sivakumar<sup>1</sup>, M. Stevenson<sup>1</sup>, A. Morss<sup>1</sup>, G. P. Lafyatis<sup>1</sup>, K. Gooch<sup>1</sup>, and G. Agarwal<sup>1</sup>  
<sup>1</sup>The Ohio State University, Columbus, OH

- 2:15PM **OP-7-2-6AD- Quantized Velocities of Microtubule-Based Motors in a Living Cell and the Effect of Cargo Size**  
J. A. Laib<sup>1</sup>, B. Dhamankar<sup>1</sup>, and W. Guilford<sup>1</sup>  
<sup>1</sup>University of Virginia, Charlottesville, VA
- 2:30PM **OP-7-2-6E - The Role of Nuclear-Cytoskeletal Coupling in Intracellular Force Transmission**  
M. L. Lombardi<sup>1</sup>, D. Jaalouk<sup>1</sup>, C. Shanahan<sup>2</sup>, K. Roux<sup>3</sup>, and J. Lammerding<sup>1</sup>  
<sup>1</sup>Brigham and Women's Hospital/Harvard Medical School, Cambridge, MA, <sup>2</sup>King's College London, London, United Kingdom, <sup>3</sup>University of Florida, Gainesville, FL
- 2:45PM **OP-7-2-6F - 3D Multiscale Molecular Model of Muscle Contraction and Relaxation**  
S. M. Mijailovich<sup>1,2</sup>, O. Kayser-Herald<sup>1</sup>, R. J. Gilbert<sup>2</sup>, and M. A. Geeves<sup>3</sup>  
<sup>1</sup>Harvard School of Public Health, Boston, MA, <sup>2</sup>Caritas St. Elizabeth's Medical Center, Boston, MA, <sup>3</sup>University of Kent, Canterbury, Kent, United Kingdom

Track: Cardiovascular Engineering - 7-2-7

### **Cardiac Electrophysiology**

Chairs: Elizabeth Lipke, Abhijit Patwardhan

Room 18C

- 1:30PM **OP-7-2-7A - Electrical Coupling of Ventricular Myocytes is Dependent on Cx43 Density and Myofibril Organization**  
M. L. McCain<sup>1,2</sup>, T. Desplantez<sup>2</sup>, N. A. Geisse<sup>1</sup>, H. Hinnen<sup>2</sup>, A. G. Kleber<sup>2</sup>, and K. K. Parker<sup>1,3</sup>  
<sup>1</sup>Disease Biophysics Group, School of Engineering and Applied Sciences, Harvard University, Cambridge, MA, <sup>2</sup>Department of Physiology, University of Bern, Bern, Switzerland, <sup>3</sup>Wyss Institute for Biologically Inspired Engineering, Harvard University, Boston, MA
- 1:45PM **OP-7-2-7B - Engineering Cardiac Form and Function through Cyclic Stretch and Extracellular Matrix Patterning**  
M. L. McCain<sup>1,2</sup>, M. D. Brigham<sup>1,2</sup>, A. W. Feinberg<sup>1,2</sup>, P. W. Alford<sup>1,2</sup>, S. P. Sheehy<sup>1,2</sup>, A. Grosberg<sup>1,2</sup>, J. A. Goss<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
- 2:00PM **OP-7-2-7C- Embryonic Stem Cell-Derived Cardiomyocytes Require Supporting Cells to Form 3D Functional Myocardium**  
B. Liau<sup>1</sup>, N. Christoforou<sup>1</sup>, K. Leong<sup>1</sup>, and N. Bursac<sup>1</sup>  
<sup>1</sup>Duke University, Durham, NC
- 2:15PM **OP-7-2-7D - Optogenetic Control of Human Pluripotent Stem Cell-Derived Cardiomyocytes**  
O. Abilez<sup>1</sup>, J. J. Baugh<sup>1</sup>, M. L. Gorrepati<sup>1</sup>, C. Lee-Messer<sup>1</sup>, M. Huang<sup>1</sup>, R. Prakash<sup>1</sup>, K. D. Wilson<sup>1</sup>, F. Jia<sup>1</sup>, J. Yu<sup>1</sup>, J. C. Wu<sup>1</sup>, K. Deisseroth<sup>1</sup>, and C. K. Zarins<sup>1</sup>  
<sup>1</sup>Stanford University, Stanford, CA
- 2:30PM **OP-7-2-7E - Simultaneous Optical Mapping of Transmembrane Potential and Wall Motion in Isolated, Perfused Hearts**  
E. B. Bourgeois<sup>1</sup>, A. D. Bachtel<sup>1</sup>, G. P. Walcott<sup>1</sup>, and J. M. Rogers<sup>1</sup>  
<sup>1</sup>University of Alabama at Birmingham, Birmingham, AL
- 2:45PM **OP-7-2-7F - Role of iPLA2 Activation in the Response of the Diabetic Rat Heart to Acute Ischemia**  
P. Rahnema<sup>1</sup>, Y. Shimoni<sup>1</sup>, and A. Nygren<sup>1</sup>  
<sup>1</sup>University of Calgary, Calgary, Alberta, Canada

Track: Cardiovascular Engineering - 7-2-8

### **Cardiovascular Fluid Dynamics - II**

Chairs: Jonathan Butcher, Alison Marsden

Room 18D

- 1:30PM **OP-7-2-8A - Lymph Transport in Rat Mesenteric Lymphatics Experiencing Edemagenic Stress**  
E. Rahbar<sup>1</sup>, T. Akl<sup>1</sup>, D. C. Zawieja<sup>2</sup>, G. L. Cote<sup>1</sup>, and J. E. Moore Jr.<sup>1</sup>  
<sup>1</sup>Texas A&M University, College Station, TX, <sup>2</sup>Texas A&M Health Science Center, Temple, TX
- 1:45PM **OP-7-2-8B- Changes in Wall Shear Stress Generated by Outflow Tract Banding in the Hearts of Chick Embryos**  
A. Liu<sup>1</sup>, A. Troyer<sup>1</sup>, X. Yin<sup>1</sup>, Z. Ma<sup>1</sup>, A. Nickerson<sup>1</sup>, R. Wang<sup>1</sup>, K. Thornburg<sup>1</sup>, and S. Rugonyi<sup>1</sup>  
<sup>1</sup>Oregon Health & Science University, Portland, OR

- 2:00PM **OP-7-2-8C - Hemodynamic Patterning of Avian Embryonic Heart**  
H. C. Yalcin<sup>1</sup>, A. Shekhar<sup>1</sup>, K. Bharadwaj<sup>1</sup>, and J. T. Butcher<sup>1</sup>  
<sup>1</sup>Cornell University, Ithaca, NY
- 2:15PM **OP-7-2-8D - Characterization of the Outflow Tract-Aortic Arch Angle During Embryonic Development in the Chick**  
W. J. Kowalski<sup>1</sup>, N. C. Teslovich<sup>1</sup>, O. Dur<sup>1</sup>, B. B. Keller<sup>2</sup>, and K. Pekkan<sup>1</sup>  
<sup>1</sup>Carnegie Mellon University, Pittsburgh, PA, <sup>2</sup>Cardiovascular Innovation Institute, University of Louisville, Louisville, KY
- 2:30PM **OP-7-2-8E - Achieving an Optimal Hepatic Flow Distribution Via a Customized Y-graft Design for the Fontan Surgery**  
A. L. Marsden<sup>1</sup>, W. Yang<sup>1</sup>, I. Vignon-Clementel<sup>2</sup>, and J. A. Feinstein<sup>3</sup>  
<sup>1</sup>UCSD, La Jolla, CA, <sup>2</sup>INRIA, Cedex, France, <sup>3</sup>Stanford University, Palo Alto, CA
- 2:45PM **OP-7-2-8F - A Lumped Parameter Model for the Measurement of O<sub>2</sub> and CO<sub>2</sub> Concentration in Congenital Heart Defects**  
W. J. Kowalski<sup>1</sup>, O. Dur<sup>1</sup>, and K. Pekkan<sup>1</sup>  
<sup>1</sup>Carnegie Mellon University, Pittsburgh, PA

Track: Orthopedic and Rehabilitation Engineering - 7-2-9

### **Orthopedic Biomaterials**

Chairs: Ed Botchwey, Kurt Kasper, Helen Lu  
Room 17A

- 1:30PM **OP-7-2-9A - Bacteriocidal Ultrasound Therapy is Enhanced with Antibacterial Nanomaterials**  
J. T. Seil<sup>1</sup>, and T. J. Webster<sup>1</sup>  
<sup>1</sup>Brown University, Providence, RI
- 1:45PM **OP-7-2-9B - Development and Optimization of a Biodegradable Bone Cement for Clinical Applications**  
A. Henslee<sup>1</sup>, D-H. Gwak<sup>1</sup>, A. Mikos<sup>1</sup>, and F. Kasper<sup>1</sup>  
<sup>1</sup>Rice University, Houston, TX
- 2:00PM **OP-7-2-9C - Keratin Biomaterials with BMPs Promote Bone Regeneration and Gap Bridging in a Critical-size Defect**  
R. de Guzman<sup>1</sup>, J. Saul<sup>1,2</sup>, M. Ellenburg<sup>1</sup>, T. Smith<sup>1</sup>, and M. Van Dyke<sup>1</sup>  
<sup>1</sup>Wake Forest University Health Sciences, Winston-Salem, NC, <sup>2</sup>Virginia Tech - Wake Forest University, Winston-Salem, NC
- 2:15PM **OP-7-2-9D - A Novel Injectable Porous hHydrogel Composite Scaffold for Bone Tissue Engineering**  
P. Nair<sup>1</sup>, D. Gyawali<sup>1</sup>, R. Tran<sup>1</sup>, and J. Yang<sup>1</sup>  
<sup>1</sup>University of Texas at Arlington, Arlington, TX
- 2:30PM **OP-7-2-9E - Development of Hybrid Scaffolds for Bone Tissue Engineering**  
Y. Kang<sup>1</sup>, A. Scully<sup>2</sup>, D. Young<sup>1</sup>, S. Kim<sup>1</sup>, H. Tsao<sup>1</sup>, and Y. Yang<sup>1,2</sup>  
<sup>1</sup>University of Texas Health Science Center at Houston, Houston, TX, <sup>2</sup>Rice University, Houston, TX
- 2:45PM **OP-7-2-9F - Chondrocyte Response in Hydrogel-Ceramic Scaffolds for Osteochondral Interface Regeneration**  
M. K. Boushell<sup>1</sup>, N. T. Khanarian<sup>1</sup>, and H. H. Lu<sup>1</sup>  
<sup>1</sup>Columbia University, New York, NY

Track: Systems Biology, Bioinformatics and Computational Biology - 7-2-10

### **Signals and Networks in Cancer and Disease - I**

Chairs: Markus Covert, Melissa Kemp  
Room 17B

- 1:30PM **OP-7-2-10A - Global Transcriptomics Analysis Reveals Gene-pair Decision Rules to Differentiate Major Brain Diseases**  
J. Sung<sup>1</sup>, P-J. Kim<sup>1</sup>, D. Geman<sup>2</sup>, and N. Price<sup>1</sup>  
<sup>1</sup>University of Illinois at Urbana-Champaign, Urbana, IL, <sup>2</sup>Johns Hopkins University, Baltimore, MD
- 1:45PM **OP-7-2-10B - Bcl-2 and XIAP Inhibit Apoptosis by Modulating Intrinsic Variations in the Mitochondrial Pathway**  
S. Raychaudhuri<sup>1</sup>, A. Nair<sup>1</sup>, J. Skommer<sup>2</sup>, and T. Brittain<sup>2</sup>  
<sup>1</sup>University of California Davis, Davis, CA, <sup>2</sup>The University of Auckland, Auckland, New Zealand

- 2:00PM **OP-7-2-10C - Multiplexed Cell Signaling Data for Constrained Fuzzy Logic Modeling**  
D. C. Clarke<sup>1</sup>, and D. A. Lauffenburger<sup>1</sup>  
<sup>1</sup>Massachusetts Institute of Technology, Cambridge, MA
- 2:15PM **OP-7-2-10D - A Single-Cell TGF $\beta$  R-JUND Dichotomy and Its Role in Basal-like Breast Cancer**  
C-C. Wang<sup>1</sup>, and K. Janes<sup>1</sup>  
<sup>1</sup>University of Virginia, Charlottesville, VA
- 2:30PM **OP-7-2-10E - Coupled Signaling Loops are Responsible for Generating Synchronized Oscillations in BMP/TGF $\beta$  Axes**  
B. Grabias<sup>1</sup>, and K. Konstantopoulos<sup>1</sup>  
<sup>1</sup>Johns Hopkins University, Baltimore, MD
- 2:45PM **OP-7-2-10F - Simulations of Competing Neuroprotective and Vascular Effects of VEGF in ALS**  
Y. L. Hashambhoy<sup>1</sup>, and F. Mac Gabhann<sup>1</sup>  
<sup>1</sup>Johns Hopkins University, Baltimore, MD

Track: Devices: Nano to Micro - 7-2-11

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

Chairs: Michelle Khine, John Zhang

Room 16A

- 1:30PM **OP-7-2-11A - Microfluidic ELISA and Cell Immunophenotyping for Ocular Diagnostics**  
J. V. Green<sup>1</sup>, D. Sun<sup>2</sup>, A. Hafezi-Moghadam<sup>2</sup>, K. Lashkari<sup>3</sup>, and S. K. Murthy<sup>1</sup>  
<sup>1</sup>Northeastern University, Boston, MA, <sup>2</sup>Massachusetts Eye and Ear Infirmary and Harvard Medical School, Boston, MA, <sup>3</sup>Schepens Eye Research Institute, Boston, MA
- 1:45PM **OP-7-2-11B - Functionalized Ultra-Nanocrystalline Diamond (UNCD) Films for Biosensing**  
A. D. Radadia<sup>1</sup>, Y-S. Liu<sup>1</sup>, N. Privorotskaya<sup>1</sup>, C. Stavis<sup>2</sup>, H. Zeng<sup>3</sup>, J. A. Carlisle<sup>3</sup>, R. J. Hamers<sup>2</sup>, W. P. King<sup>1</sup>, and R. Bashir<sup>1</sup>  
<sup>1</sup>University of Illinois, Urbana, IL, <sup>2</sup>University of Wisconsin - Madison, Madison, WI, <sup>3</sup>Advanced Diamond Technologies, Inc., Romeoville, IL
- 2:00PM **OP-7-2-11C - Phosphopeptides Enrichment on Functionalized Nanoporous Silica Thin Films for Cancer Early Diagnostics**  
Y. Hu<sup>1</sup>, Y. Peng<sup>1</sup>, L. Brousseau<sup>1</sup>, and M. Ferrari<sup>1</sup>  
<sup>1</sup>The University of Texas Health Science Center at Houston, Houston, TX
- 2:15PM **OP-7-2-11D - An Optofluidic Platform for Characterizing Mechanical Properties of Metastatic Cancer Cells**  
M. Mak<sup>1</sup>, C. Reinhart-King<sup>1</sup>, and D. Erickson<sup>1</sup>  
<sup>1</sup>Cornell University, Ithaca, NY
- 2:30PM **OP-7-2-11E - Parylene Peel-Strips for Multiplexed Aptamers Separation and Recovery**  
C. P. Tan<sup>1</sup>, K. E. Ceniccola<sup>1</sup>, K. Szeto<sup>1</sup>, D. M. Lin<sup>1</sup>, and H. G. Craighead<sup>1</sup>  
<sup>1</sup>Cornell University, Ithaca, NY
- 2:45PM **OP-7-2-11F - Paper-based ELISA**  
C-M. Cheng<sup>1</sup>, X. Liu<sup>1</sup>, K. Mirica<sup>1</sup>, C. Mace<sup>1</sup>, and G. Whitesides<sup>1</sup>  
<sup>1</sup>Harvard University, Cambridge, MA

Track: Devices: Nano to Micro - 7-2-12

**Nano to Micro: Fluidic Technologies - I**

Chairs: Samir Iqbal, Christine Trinkle

Room 16B

- 1:30PM **OP-7-2-12A - Electrical Measurement and Characterization of PBS-in-ionic Liquid Droplets in a Microfluidic Device**  
W-J. Chang<sup>1</sup>, E. Salm<sup>1,2</sup>, N. N. Watkins<sup>1,2</sup>, Y-S. Jin<sup>2,3</sup>, and R. Bashir<sup>1,2</sup>  
<sup>1</sup>Micro and Nanotechnology Laboratory, Urbana, IL, <sup>2</sup>University of Illinois at Urbana-Champaign, Urbana, IL, <sup>3</sup>Institute for Genomic Biology, Urbana, IL
- 1:45PM **OP-7-2-12B - Study of Surface Roughness on Affinity-Based Cell Capture in Microfluidic Devices**  
B. Wang<sup>1</sup>, P. Kumnorkaew<sup>1</sup>, M. Wolfe<sup>1</sup>, A. Weldon<sup>1</sup>, C. Tibaldi<sup>1</sup>, J. Gilchrist<sup>2</sup>, and X. Cheng<sup>1</sup>  
<sup>1</sup>Lehigh University, Bethlehem, PA, <sup>2</sup>Lehigh University, Bethlehem, PA

- 2:00PM **OP-7-2-12C - Microfluidic Zone Refining for Biosample Preparation**  
P. Kashani<sup>1</sup>, and P. Kavehpour<sup>1</sup>  
<sup>1</sup>UCLA, Los Angeles, CA
- 2:15PM **OP-7-2-12D - Isolation of Circulating Cancer Cells From Dilute Whole Blood Samples Using Contactless Dielectrophoresis**  
M. B. Sano<sup>1</sup>, E. Henslee<sup>1</sup>, H. Shafiee<sup>1</sup>, and R. V. Davalos<sup>1</sup>  
<sup>1</sup>Virginia Tech, Blacksburg, VA
- 2:30PM **OP-7-2-12E - Simple Particle-Induced Transverse Mass Transport at High Flow Rates**  
H. Amini<sup>1,2</sup>, E. Sollier<sup>1,2</sup>, and D. Di Carlo<sup>1,2</sup>  
<sup>1</sup>University of California, Los Angeles, Los Angeles, CA, <sup>2</sup>California NanoSystems Institute, Los Angeles, CA
- 2:45PM **OP-7-2-12F - 3D Tumor Spheroid Model Using a Perfused Array of Spherical Microcavities**  
S. Agastin<sup>1</sup>, U-B. T. Giang<sup>2</sup>, L. DeLouise<sup>2</sup>, and M. King<sup>1</sup>  
<sup>1</sup>Cornell University, Ithaca, NY, <sup>2</sup>University of Rochester, Rochester, NY

Track: Drug Delivery Systems - **7-2-13**

### ***Nucleic Acid Delivery - II***

Chairs: Michelle Dawson, Craig Duvall

Room 14

*\* Drug Delivery Systems Track is sponsored by Acta Biomaterialia*

- 1:30PM **OP-7-2-13A - Nanoparticle-mediated p53 Gene Delivery for Tumor Inhibition**  
B. Sharma<sup>1</sup>, W. Ma<sup>2</sup>, J. Panyam<sup>3</sup>, I. Adjei<sup>1</sup>, S. Dimitrijevic<sup>1</sup>, and V. Labhasetwar<sup>1</sup>  
<sup>1</sup>Lerner Research Institute, Cleveland Clinic, Cleveland, OH, <sup>2</sup>Moore's Cancer Center, University of California San Diego, La Jolla, CA, <sup>3</sup>University of Minnesota, College of Pharmacy, Minneapolis, MN
- 1:45PM **OP-7-2-13B - Treatment of Ovarian Cancer With Tumor-homing siRNA Nanocomplexes**  
Y. Ren<sup>1</sup>, A. Agrawal<sup>1</sup>, G. von Maltzahn<sup>1</sup>, V. Fogal<sup>2</sup>, H. Cheung<sup>3</sup>, E. Ruoslahti<sup>2</sup>, W. C. Hahn<sup>3</sup>, and S. N. Bhatia<sup>4,5</sup>  
<sup>1</sup>Massachusetts Institute of Technology, Cambridge, MA, <sup>2</sup>Burnham Institute for Medical Research, Santa Barbara, CA, <sup>3</sup>Dana-Farber Cancer Institute/Broad Institute/BWH, Cambridge, MA, <sup>4</sup>MIT/HST/BWH, Cambridge, MA, <sup>5</sup>HHMI, Cambridge, MA
- 2:00PM **OP-7-2-13C - Effect of Nanoparticle Conjugation on Gene Silencing by RNA Interference**  
N. Singh<sup>1</sup>, A. Agrawal<sup>1</sup>, A. K. Leung<sup>1</sup>, P. A. Sharp<sup>1</sup>, and S. N. Bhatia<sup>1,2</sup>  
<sup>1</sup>MIT, Cambridge, MA, <sup>2</sup>Howard Hughes Medical Institute, Cambridge, MA
- 2:15PM **OP-7-2-13D - Antisense Silver Nanocomposites for Photoactivated Gene Silencing**  
P. K. Brown<sup>1</sup>, A. T. Qureshi<sup>1</sup>, D. J. Hayes<sup>1</sup>, and W. T. Monroe<sup>1</sup>  
<sup>1</sup>Louisiana State University, Baton Rouge, LA
- 2:30PM **OP-7-2-13E - Polybasic 2-(diethylaminoethyl) Methacrylate Nanogels and Their Application in Oral siRNA dDelivery**  
W. B. Liechty<sup>1</sup>, and N. A. Peppas<sup>1</sup>  
<sup>1</sup>The University of Texas at Austin, Austin, TX
- 2:45PM **OP-7-2-13F - Orally Delivered Thioketal-nanoparticles Loaded With siRNA Target Reactive Oxygen Species and Inhibit Gene Expression in the Intestines**  
D. S. Wilson<sup>1</sup>, G. Dalmasso<sup>2</sup>, D. Merlin<sup>2</sup>, and N. Murthy<sup>3</sup>  
<sup>1</sup>Georgia Tech, Atlanta, GA, <sup>2</sup>Emory University, Atlanta, GA, <sup>3</sup>Georgia Tech, Atlanta, GA

Track: New Frontiers in Bioengineering - **7-2-14**

### ***Biological Engineering in Cancer***

Chairs: Celeste Nelson, Cynthia Reinhardt-King

Room 15

- 1:30PM **OP-7-2-14A - Slimy Forces: The Glycocalyx Controls Integrin Perception of the Extracellular Matrix**  
M. J. Paszek<sup>1</sup>, C. Dufort<sup>1</sup>, J. Lakins<sup>1</sup>, J. Hudak<sup>2</sup>, C. R. Bertozzi<sup>2,3</sup>, D. A. Hammer<sup>4</sup>, and V. M. Weaver<sup>1</sup>  
<sup>1</sup>University of California, San Francisco, San Francisco, CA, <sup>2</sup>University of California, Berkeley, Berkeley, CA, <sup>3</sup>Lawrence Berkeley National Laboratory, Berkeley, CA, <sup>4</sup>University of Pennsylvania, Philadelphia, PA

- 1:45PM **OP-7-2-14B - Spatial Regulation of Host-tumor Cell Interactions**  
E. Boghaert<sup>1</sup>, and C. M. Nelson<sup>1</sup>  
<sup>1</sup>Princeton University, Princeton, NJ
- 2:00PM **OP-7-2-14C - Invading Tumor Cells Take Advantage of Interstitial Flow-induced Matrix Priming by Fibroblasts**  
A. C. Shieh<sup>1</sup>, H. A. Rozansky<sup>1</sup>, M. Seneviratne<sup>1</sup>, and M. A. Swartz<sup>1</sup>  
<sup>1</sup>Ecole Polytechnique Federale de Lausanne, Lausanne, Vaud, Switzerland
- 2:15PM **OP-7-2-14D - The Role of Mena Invasive Isoforms in Escape from EGFR Inhibition**  
S. K. Alford<sup>1</sup>, E. Batchelder<sup>2</sup>, D. Yazar<sup>2</sup>, F. B. Gertler<sup>1</sup>, and D. A. Lauffenburger<sup>1</sup>  
<sup>1</sup>MIT, Cambridge, MA, <sup>2</sup>Whitehead Institute, Cambridge, MA
- 2:30PM **OP-7-2-14E - Isolation of Circulating Tumor Cells from Cancer Patients using a Microfluidic Vortex Generator**  
S. L. Stott<sup>1</sup>, C-H. Hsu<sup>1</sup>, D. T. Miyamoto<sup>1</sup>, S. M. Rothenberg<sup>1</sup>, S. Nagrath<sup>1</sup>, R. J. Lee<sup>1</sup>, L. V. Sequist<sup>1</sup>, S. Maheswaran<sup>1</sup>, D. A. Haber<sup>1</sup>, and M. Toner<sup>1</sup>  
<sup>1</sup>Massachusetts General Hospital, Charlestown, MA
- 2:45PM **OP-7-2-14F - Engineering Growth Factor Ligands as Cancer Diagnostics and Therapeutics**  
N. Papo<sup>1</sup>, D. S. Jones<sup>1</sup>, A. P. Silverman<sup>1</sup>, and J. R. Cochran<sup>1</sup>  
<sup>1</sup>Stanford University, Stanford, CA

Track: Tissue Engineering \* - 7-2-15

### **Nano- and Micro-Engineering in Tissue Engineering - II**

Chairs: Zach Hilt, Sihong Wang

Ballroom E

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

- 1:30PM **OP-7-2-15A - 3D In Vitro Perfused Human Capillaries for Tissue Engineering**  
M. L. Moya<sup>1</sup>, Y-H. Hsu<sup>1</sup>, C. C. Hughes<sup>1</sup>, A. P. Lee<sup>1</sup>, and S. C. George<sup>1</sup>  
<sup>1</sup>University of California, Irvine, Irvine, CA
- 1:45PM **OP-7-2-15B - Micro-patterned Substrates for Cardiac Tissue Engineering**  
S-K. Park<sup>1</sup>, H-D. Park<sup>1</sup>, K. Na<sup>1</sup>, S. Yang<sup>1</sup>, E-S. Yoon<sup>1</sup>, and J. Kim<sup>1</sup>  
<sup>1</sup>Nano-Bio Center, Korea Institute of Science and Technology, Seoul, Korea, Republic of
- 2:00PM **OP-7-2-15C - Capillary Network Formation and Integration within Perfused Microfluidic Poly(ethylene glycol) hydrogels**  
M. P. Cuchiara<sup>1</sup>, and J. L. West<sup>1</sup>  
<sup>1</sup>Rice University, Houston, TX
- 2:15PM **OP-7-2-15D - Endothelial Progenitor Cell Migration is Directed by Gradients of SDF and VEGF**  
E. M. Anderson<sup>1,2</sup>, D. Huh<sup>2</sup>, and D. J. Mooney<sup>1,2</sup>  
<sup>1</sup>Harvard University, Cambridge, MA, <sup>2</sup>Wyss Institute, Boston, MA
- 2:30PM **OP-7-2-15E - Tuning Directed Cell Motility on Micropatterns through Pattern Geometry and Signal Alterations**  
K. Kushiro<sup>1</sup>, S. Chang<sup>1</sup>, and A. R. Asthagiri<sup>1</sup>  
<sup>1</sup>California Institute of Technology, Pasadena, CA
- 2:45PM **OP-7-2-15F - Efficient Myogenic Commitment of hESC-derived Mesenchymal Cells on Biomimetic Materials Replicating Myoblast Topography**  
N. S-Y. Hwang<sup>1</sup>, S-G. Im<sup>1</sup>, R. S. Langer<sup>1</sup>, and D. G. Anderson<sup>1</sup>  
<sup>1</sup>Massachusetts Institute of Technology, Cambridge, MA

Track: Tissue Engineering \* - 7-2-16

### **Cardiovascular Tissue Engineering - I**

Chairs: Andrea Gobin, Jianjun Guan

Ballroom F

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

- 1:30PM **OP-7-2-16A - Mimicry of Endogenous Microvascular Structures in Poly(ethylene glycol) Hydrogels**  
J. Hoffmann<sup>1</sup>, J. Culver<sup>2</sup>, M. Dickinson<sup>2</sup>, and J. West<sup>1</sup>  
<sup>1</sup>Rice University, Houston, TX, <sup>2</sup>Baylor College of Medicine, Houston, TX

- 1:45PM **OP-7-2-16B - *In Vivo* Imaging of Microvascular Network Development in a Tissue Engineered Construct**  
G. Gruionu<sup>1</sup>, Z. Galis<sup>1</sup>, T. Secomb<sup>2</sup>, and J. B. Hoying<sup>3</sup>  
<sup>1</sup>Indiana University School of Medicine, Indianapolis, IN, <sup>2</sup>University of Arizona, Tucson, AZ, <sup>3</sup>University of Louisville, Louisville, KY
- 2:00PM **OP-7-2-16C -Engineering the Synergy Between Growth Factors and Integrins for Angiogenesis**  
M. M. Martino<sup>1</sup>, and J. A. Hubbell<sup>1</sup>  
<sup>1</sup>Swiss Federal Institute of Engineering, Lausanne, VD, Switzerland
- 2:15PM **OP-7-2-16D - Compliance-Matched Arterial Vein Grafts via an External, Electrospun, Biodegradable Elastomeric Wrap**  
Q. Wang<sup>1,2</sup>, Y. Hong<sup>1,2</sup>, W. He<sup>1,2</sup>, D. W. Chew<sup>1,2</sup>, J. Rendemonti<sup>1,2</sup>, W. R. Wagner<sup>1,2</sup>, and D. A. Vorp<sup>1,2</sup>  
<sup>1</sup>University of Pittsburgh, Pittsburgh, PA, <sup>2</sup>McGowan Institute for Regenerative Medicine, Pittsburgh, PA
- 2:30PM **OP-7-2-16E - Engineered Arteries Developed in a Multi-graft Flow-stretch Bioreactor with Noninvasive Monitoring**  
Z. Syedain<sup>1</sup>, L. Meier<sup>1</sup>, A. Lee<sup>1</sup>, and R. Tranquillo<sup>1</sup>  
<sup>1</sup>University of Minnesota, Minneapolis, MN
- 2:45PM **OP-7-2-16F - Cellular and Biomechanical Analysis of an *In Vitro* Cultured Small Diameter Blood Vessel**  
P. S. Mcftridge<sup>1</sup>  
<sup>1</sup>University of Florida, Gainesville, FL

Track: Tissue Engineering - 7-2-17

***Musculoskeletal Tissue Engineering - II***

Chairs: Elizabeth Cosgriff-Hernandez, Robert Mauck  
Ballroom G

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

- 1:30PM **OP-7-2-17A - Xenogenic Biologic Scaffold as a Temporomandibular Joint Disc in a Canine Model**  
A. Almarza<sup>1</sup>, B. Brown<sup>1</sup>, W. Chung<sup>1</sup>, C. Kunkle<sup>1</sup>, S. Henderson<sup>1</sup>, and S. Badylak<sup>1</sup>  
<sup>1</sup>University of Pittsburgh, Pittsburgh, PA
- 1:45PM **OP-7-2-17B - Histologic and Mechanical Analysis of Engineered Bone-Ligament-Bone Constructs After 6-Month ACL reconstruction in Sheep**  
J. Ma<sup>1</sup>, M. Smietana<sup>1</sup>, L. Larkin<sup>1</sup>, T. Kostrominova<sup>2</sup>, E. Wojtys<sup>1</sup>, and E. Arruda<sup>1</sup>  
<sup>1</sup>University of Michigan, Ann Arbor, MI, <sup>2</sup>Indiana University School of Medicine Northwest, Gary, IN
- 2:00PM **OP-7-2-17C - Biodegradable, Anti-inflammatory Polymer to Aid Bone Defect Repair and Prevent Soft Tissue Ingrowth**  
S. Snyder<sup>1</sup>, J. O'Connor<sup>2</sup>, J. Ricci<sup>3</sup>, and K. Urich<sup>1</sup>  
<sup>1</sup>Rutgers University, Piscataway, NJ, <sup>2</sup>University of Medicine and Dentistry of New Jersey, Newark, NJ, <sup>3</sup>New York University, New York, NY
- 2:15PM **OP-7-2-17D - Zonal Chondrocyte Response to Growth Factor Delivery and Matrix Molecules**  
E. E. Coates<sup>1</sup>, and J. P. Fisher<sup>1</sup>  
<sup>1</sup>University of Maryland, College Park, MD
- 2:30PM **OP-7-2-17E - Phenotype Retention and Cell Migration From Minced Cartilage in Chondroitin Sulfate-Bone Marrow Gels**  
J. Simson<sup>1</sup>, and J. Elisseff<sup>1</sup>  
<sup>1</sup>Johns Hopkins University, Baltimore, MD
- 2:45PM **OP-7-2-17F - Poroelastic Material Properties of Hydrogels and Cartilage Evaluated Using Ultrasound**  
J. Walker<sup>1</sup>, J. M. Mansour<sup>1</sup>, A. I. Caplan<sup>1</sup>, V. M. Goldberg<sup>1</sup>, and J. F. Welter<sup>1</sup>  
<sup>1</sup>Case Western Reserve University, Cleveland, OH

## PLATFORM SESSION - 7-3 - 4:00PM - 5:30PM

Track: Respiratory Engineering - 7-3-1

### **Complex and Multiscale Behavior in the Lung**

Chairs: Jason H.T. Bates, Tilo Winkler

Room 12A

- 4:00PM **OP-7-3-1A - Multi-scale Manifestations of Airway Smooth Muscle Mechanics**  
J. H. Bates<sup>1</sup>  
<sup>1</sup>University of Vermont, Burlington, VT
- 4:15PM **OP-7-3-1B - Effects of Intratidal Overdistention and Derecruitment on Global Lung Mechanics: A Simulation Study**  
R. Amini<sup>1</sup>, and D. W. Kaczka<sup>1</sup>  
<sup>1</sup>Beth Israel Deaconess Medical Center, Boston, MA
- 4:30PM **OP-7-3-1C - Computational Model of Pulmonary Small Airways Interdependence**  
H. Fujioka<sup>1</sup>, D. Halpern<sup>2</sup>, and D. P. Gaver III<sup>1</sup>  
<sup>1</sup>Tulane University, New Orleans, LA, <sup>2</sup>University of Alabama, Tuscaloosa, AL
- 4:45PM **OP-7-3-1D - A Multi-scale Model of Regional Perfusion in the Human Pulmonary Circulation**  
M. Tawhai<sup>1</sup>, A. Clark<sup>1</sup>, and K. Burrowes<sup>2</sup>  
<sup>1</sup>University of Auckland, Auckland, Auckland, New Zealand, <sup>2</sup>Oxford University, Oxford, Oxfordshire, United Kingdom
- 5:00PM **OP-7-3-1E - Long-range Elastic Interactions Due to Gravity in a Network Model of Co-existent Pulmonary Emphysema and Fibrosis**  
B. Suki<sup>1</sup>, H. Parameswaran<sup>1</sup>, A. Majumdar<sup>1</sup>, V. Cottin<sup>2</sup>, J-F. Cordier<sup>3</sup>, and J. H. Bates<sup>4</sup>  
<sup>1</sup>Boston University, Boston, MA, <sup>2</sup>Lyon University, Lyon, France, <sup>3</sup>Université Claude Bernard, Lyon, France, <sup>4</sup>University of Vermont, Burlington, VT
- 5:15PM **OP-7-3-1F - Dynamic Length Scale Behavior of Ventilation in a Model of Bronchoconstriction**  
T. Winkler<sup>1,2</sup>, A. Braune<sup>1</sup>, and J. G. Venegas<sup>1</sup>  
<sup>1</sup>Massachusetts General Hospital, Boston, MA, <sup>2</sup>Harvard Medical School, Boston, MA

Track: Biomedical Imaging and Optics - 7-3-2

### **Optical and Ultrasound Imaging of Cancer**

Chairs: Laura Marcu, Kathy Nightingale

Room 12B

- 4:00PM **OP-7-3-2A - In Vivo Measurements of the Mechano-environment of Rat Mammary Tumors**  
Y. Wang<sup>1,2</sup>, M. Orescanin<sup>1,2</sup>, and M. Insana<sup>1,2</sup>  
<sup>1</sup>University of Illinois at Urbana-Champaign, Urbana, IL, <sup>2</sup>Beckman Institute of Advanced Science and Technology, Urbana, IL
- 4:15PM **OP-7-3-2B - Real-Time Hyperspectral Endoscope for Early Cancer Diagnostics**  
R. T. Kester<sup>1</sup>, N. Bedard<sup>1</sup>, and T. S. Tkaczyk<sup>1</sup>  
<sup>1</sup>Rice University, Houston, TX
- 4:30PM **OP-7-3-2C - Optical Imaging of Ovarian Carcinogenesis**  
J. Barton<sup>1</sup>  
<sup>1</sup>The University of Arizona, Tucson, AZ
- 4:45PM **OP-7-3-2D - In Vivo Detection of Oral Cancer Based on OCT-derived Morphological and FLIM-derived Biochemical Features of the Oral Mucosa**  
P. Pande<sup>1</sup>, S. Shresta<sup>1</sup>, J. Park<sup>1</sup>, B. E. Applegate<sup>1</sup>, and J. A. Jo<sup>1</sup>  
<sup>1</sup>Texas A&M University, College Station, TX
- 5:00PM **OP-7-3-2E - A Hand-held Imaging and Spectroscopy Device for Intraoperative, Contrast-enhanced Tumor Detection**  
A. M. Mohs<sup>1</sup>, M. C. Mancini<sup>1</sup>, J. M. Provenzale<sup>1,2</sup>, S. Singhal<sup>3</sup>, M. D. Wang<sup>1</sup>, and S. Nie<sup>1</sup>  
<sup>1</sup>Emory - Georgia Tech, Atlanta, GA, <sup>2</sup>Duke University, Durham, NC, <sup>3</sup>University of Pennsylvania, Philadelphia, PA

5:15PM **OP-7-3-2F - How Multiphoton Imaging Will Revolutionize Intra-operative Surgical Decisions**

W. Zipfel<sup>1</sup>, and R. Williams<sup>1</sup>  
<sup>1</sup>Cornell University, Ithaca, NY

Track: Biomedical Imaging and Optics - 7-3-3

### **CV Imaging**

Chairs: Gang Bao, Angie Louie

Room 19A

4:00PM **OP-7-3-3A - Three-dimensional Photothermal Wave Imaging of Lipids in Atherosclerotic Plaque**

T. Wang<sup>1</sup>, J. Mancuso<sup>2</sup>, B. Willsey<sup>1</sup>, X. Li<sup>2</sup>, L. Ma<sup>1</sup>, K. P. Johnston<sup>1</sup>, M. D. Feldman<sup>2</sup>, and T. E. Milner<sup>1</sup>  
<sup>1</sup>University of Texas at Austin, Austin, TX, <sup>2</sup>University of Texas Health Science Center at San Antonio, San Antonio, TX

4:15PM **OP-7-3-3B - Time Resolved Spectroscopy Differentiates Matrix Metalloproteinase Levels in Atherosclerotic Plaque**

J. E. Phipps<sup>1</sup>, N. Hatami<sup>1</sup>, J. Jo<sup>1</sup>, M. C. Fishbein<sup>2</sup>, T. Papaioannou<sup>3</sup>, Q. Fang<sup>3</sup>, J. Baker<sup>2</sup>, and L. Marcu<sup>1</sup>  
<sup>1</sup>University of California, Davis, Davis, CA, <sup>2</sup>University of California, Los Angeles, Los Angeles, CA, <sup>3</sup>Cedars Sinai Medical Center, Los Angeles, CA

4:30PM **OP-7-3-3C - Multifunctional Nanoclusters for Imaging Plaque-Based Macrophages**

B. W. Willsey<sup>1</sup>, L. L. Ma<sup>1</sup>, T. Wang<sup>1</sup>, V. Sapozhnikova<sup>2</sup>, J. Mancuso<sup>2,3</sup>, J. T. Jenkins<sup>2</sup>, A. Borwankar<sup>1</sup>, D. Rigdon<sup>1</sup>, M. Feldman<sup>2,3</sup>, T. Milner<sup>1</sup>, and K. Johnston<sup>1</sup>  
<sup>1</sup>University of Texas at Austin, Austin, TX, <sup>2</sup>University of Texas Health Science Center San Antonio, San Antonio, TX, <sup>3</sup>South Texas Veteran Affairs Hospital System, San Antonio, TX

4:45PM **OP-7-3-3D - High Resolution Cardiac Wall Motion Analysis Using 320-detector CT: A First Study**

A. Pourmorteza<sup>1</sup>, A. C. Lardo<sup>1</sup>, D. Herzka<sup>1</sup>, J. L. Prince<sup>1</sup>, and E. R. McVeigh<sup>1</sup>  
<sup>1</sup>Johns Hopkins University School of Medicine, Baltimore, MD

5:00PM **OP-7-3-3E - Guiding Transcatheter Cardiac Radiofrequency Ablation with Acoustic Radiation Force Impulse Imaging**

S. A. Eyerly<sup>1</sup>, T. D. Bahnson<sup>2</sup>, S. J. Hsu<sup>3</sup>, D. P. Bradley<sup>1</sup>, G. E. Trahey<sup>1,2</sup>, and P. D. Wolf<sup>1</sup>  
<sup>1</sup>Duke University, Durham, NC, <sup>2</sup>Duke University Medical Center, Durham, NC, <sup>3</sup>Siemens Healthcare, Issaquah, WA

5:15PM **OP-7-3-3F - A Semi-automated Approach to Mitral Valve Morphometry Using Real-time 3D Echocardiography**

A. M. Pouch<sup>1</sup>, P. A. Yushkevich<sup>1</sup>, B. M. Jackson<sup>1</sup>, J. H. Gorman<sup>1</sup>, R. C. Gorman<sup>1</sup>, and C. M. Sehgal<sup>1</sup>  
<sup>1</sup>University of Pennsylvania, Philadelphia, PA

Track: Neural Engineering - 7-3-4

### **Engineering the Neural Environment**

Chairs: Jeffrey Capadona, Shelly Sakiyama-Elbert

Room 19B

4:00PM **OP-7-3-4A - A Novel Optically Transparent Biochip for Site-Specific Transfection of Cells in a Culture**

C. Patel<sup>1</sup>, A. Sridharan<sup>1</sup>, and J. Muthuswamy<sup>1</sup>  
<sup>1</sup>Arizona State University, Tempe, AZ

4:15PM **OP-7-3-4B - Electrical Activity Promotes Neuronal Survival and Regeneration**

J. Goldberg<sup>1</sup>, and R. G. Corredor<sup>1</sup>  
<sup>1</sup>University of Miami, Miami, FL

4:30PM **OP-7-3-4C - Three-Dimensional Gradients of Immobilized Factors**

S. Seidlits<sup>1</sup>, E. Ritschdorff<sup>1</sup>, D. Hernandez<sup>1</sup>, E. Spivey<sup>1</sup>, C. Schmidt<sup>1</sup>, and J. Shear<sup>1</sup>  
<sup>1</sup>University of Texas at Austin, Austin, TX

4:45PM **OP-7-3-4D - The Formation of Nerve Functional Units by Embryonic Stem Cells in the Novel Microfluidic Platform**

I. Yang<sup>1</sup>, S. Liu<sup>2</sup>, and N. Thakor<sup>1</sup>  
<sup>1</sup>Johns Hopkins University, Baltimore, MD, <sup>2</sup>Kennedy Krieger Institute, Baltimore, MD

5:00PM **OP-7-3-4E - Novel Partially-biodegradable Neural Probe and Biocompatible Tissue Response**

M. Han<sup>1</sup>, D. B. McCreery<sup>1</sup>, and P. S. Manoonkitiwongsa<sup>1</sup>

<sup>1</sup>Huntington Medical Research Institutes, Pasadena, CA

5:15PM **OP-7-3-4F - Laminin Modified Hyaluronic Acid Hydrogels Promote Axonal Regeneration Following Spinal Cord Injury in Rats**

B. D. Milman<sup>1</sup>, Z. Z. Khaing<sup>1</sup>, S. A. Geissler<sup>1</sup>, and C. E. Schmidt<sup>1</sup>

<sup>1</sup>University of Texas at Austin, Austin, TX

Track: Cellular and Molecular Engineering - 7-3-5

### ***Molecular Engineering - II***

Chairs: Craig Duvall, Junghae Suh

Room 18A

4:00PM **OP-7-3-5A - Engineering Aglycosylated Antibodies with Improved Circulation Half-life**

T. Kang<sup>1</sup>, S. Jung<sup>1</sup>, and G. Georgiou<sup>1</sup>

<sup>1</sup>The University of Texas at Austin, Austin, TX

4:15PM **OP-7-3-5B - Toward Novel Molecular Sensors: Incorporating Unnatural Amino Acids in Stem Cells**

K. Moncivais<sup>1</sup>, L. Xiang<sup>1</sup>, and Z. J. Zhang<sup>1</sup>

<sup>1</sup>University of Texas at Austin, Austin, TX

4:30PM **OP-7-3-5C - Development of a Novel Fibrin Binding Peptide for Incorporation Into Biomatrices**

J. J. Rice<sup>1</sup>, M. Martino<sup>1</sup>, S. Kontos<sup>1</sup>, and J. Hubbell<sup>1</sup>

<sup>1</sup>EPFL, Lausanne, Switzerland

4:45PM **OP-7-3-5D - Influence on Pertussis Toxin Intracellular Trafficking by Antibodies**

J. N. Sutherland<sup>1</sup>, and J. A. Maynard<sup>1</sup>

<sup>1</sup>The University of Texas at Austin, Austin, TX

5:00PM **OP-7-3-5E - Determining the Disassociation Constant of Protein-Protein Interaction Using FRET-based Method**

Y. Song<sup>1</sup>, and J. Liao<sup>1</sup>

<sup>1</sup>University of California, Riverside, Riverside, CA

5:15PM **OP-7-3-5F - Determining Self-Assembly Mechanism of a Protein Nanocage**

T. Peng<sup>1</sup>, and S. Lim<sup>1</sup>

<sup>1</sup>Nanyang Technological University, Nanyang, Singapore

Track: Cellular and Molecular Engineering - 7-3-6

### ***Mechanotransduction - I***

Chairs: Chris Jacobs, Jeff Jacot

Room 18B

4:00PM **OP-7-3-6A - Regulation of Stretch-induced JNK, p38, and ERK Activities by Stress Fiber Tension**

H-J. Hsu<sup>1</sup>, C-F. Lee<sup>1</sup>, A. Locke<sup>1</sup>, S. Q. Vanderzyl<sup>1</sup>, and R. R. Kaunas<sup>1</sup>

<sup>1</sup>Texas A&M, College Station, TX

4:15PM **OP-7-3-6B - Glycated Substrate Altering Endothelial Cell Response to Fluid Shear Stress**

S. F. Kemeny<sup>1</sup>, and A. M. Clyne<sup>1</sup>

<sup>1</sup>Drexel University, Philadelphia, PA

4:30PM **OP-7-3-6C - Defining the Gene Expression Changes Required for Morphogenesis of Engineered Tissues**

K. Lee<sup>1</sup>, and C. M. Nelson<sup>1</sup>

<sup>1</sup>Princeton University, Princeton, NJ

4:45PM **OP-7-3-6D - Tissue Assembly Requires Sensitivity to Matrix Mechanics and Differential ECM Assembly**

J. P. Califano<sup>1</sup>, and C. A. Reinhart-King<sup>1</sup>

<sup>1</sup>Cornell University, Ithaca, NY

5:00PM **OP-7-3-6E - A Genetic Strategy for Graded, Dynamic Control of Cell-matrix Mechanobiology**  
J. MacKay<sup>1</sup>, A. Keung<sup>1</sup>, and S. Kumar<sup>1</sup>  
<sup>1</sup>University of California, Berkeley, CA

5:15PM **OP-7-3-6F - Effects of Fluid Flow on TGF-Beta1 Signaling in Human Mesenchymal Stem Cells**  
R. Diop<sup>1</sup>, and S. Li<sup>1</sup>  
<sup>1</sup>University of California, Berkeley, CA

Track: Cardiovascular Engineering - 7-3-7

***Innovations in Cardiovascular Bioengineering II: Vascular***

Chairs: Hai-Chao Han, Amina Qutub

Room 18C

4:00PM **OP-7-3-7A - Effects of Aortic Wave Dynamics on Left Ventricular Power Requirement**  
N. M. Pahlevan<sup>1</sup>, and M. Gharib<sup>1</sup>  
<sup>1</sup>California Institute of Technology, Pasadena, CA

4:15PM **OP-7-3-7B - In Vitro Vasospasms: Acute Traumatic Injury and Vascular Hypercontractility**  
P. W. Alford<sup>1,2</sup>, J. A. Goss<sup>1,2</sup>, M. D. Brigham<sup>1,2</sup>, A. W. Feinberg<sup>1,2</sup>, and K. K. Parker<sup>1,2</sup>  
<sup>1</sup>Disease Biophysics Group, Harvard University, Cambridge, MA, <sup>2</sup>Wyss Institute for Biologically Inspired Engineering, Boston, MA

4:30PM **OP-7-3-7C - The Effect of Aneurysm on the Delamination Strength in Human Ascending Thoracic Aorta**  
S. Pasta<sup>1,2</sup>, J. A. Phillippi<sup>1,3</sup>, S. C. Watkins<sup>1,3</sup>, T. G. Gleason<sup>1,3</sup>, and D. A. Vorp<sup>1,3</sup>  
<sup>1</sup>University of Pittsburgh, Pittsburgh, PA, <sup>2</sup>RiMED Foundation, Palermo, Italy, Italy, <sup>3</sup>McGowan Institute for Regenerative Medicine, Pittsburgh, PA

4:45PM **OP-7-3-7D - Fluid-structure Interaction (FSI) Modeling in Patient Based Vulnerable Plaques and Carotid Arteries**  
M. Xenos<sup>1</sup>, D. Peter<sup>1</sup>, X. Liang<sup>1</sup>, I. Lavi<sup>2</sup>, Y. Alemu<sup>1</sup>, S. Einav<sup>1</sup>, and D. Bluestein<sup>1</sup>  
<sup>1</sup>Stony Brook University, Stony Brook, NY, <sup>2</sup>Tel Aviv University, Tel Aviv, Israel

5:00PM **OP-7-3-7E - Cerebral Artery Blood Flow As Source of Outer Ear Canal Acoustic Emissions**  
P. Richardson<sup>1</sup>, R. Levine<sup>2</sup>, and Y. Yu<sup>1</sup>  
<sup>1</sup>Brown University, Providence, RI, <sup>2</sup>Mass Eye & Ear Inst, Boston, MA

5:15PM **OP-7-3-7F - Effect of Isoflurane on Brain Oxygen Autoregulation in Rabbits**  
J. Eassa<sup>1</sup>, J. Lakhoo<sup>1</sup>, P. Han<sup>1</sup>, D. Aksenov<sup>2,3</sup>, A. Wyrwicz<sup>2,3</sup>, and R. A. Linsenmeier<sup>1</sup>  
<sup>1</sup>Northwestern University, Evanston, IL, <sup>2</sup>NorthShore University HealthSystem, Evanston, IL, <sup>3</sup>University of Chicago, Chicago, IL

Track: Cardiovascular Engineering - 7-3-8

***Microvasculature, Angiogenesis, and Capillary Patches***

Chairs: Shayn Peirce-Cottler, Mariah Hahn

Room 18D

4:00PM **OP-7-3-8A - Spatial Regulation and Temporal Coordination of Angiogenesis by Notch**  
W. W. Yuen<sup>1</sup>, N. R. Du<sup>1</sup>, and D. J. Mooney<sup>1</sup>  
<sup>1</sup>Harvard University, Cambridge, MA

4:15PM **OP-7-3-8B - 3D Angiogenic Sprouting Controlled by Adhesive Ligands and MMP-susceptibility in PEG-Peptide Hydrogels**  
J. S. Miller<sup>1</sup>, C. J. Shen<sup>1</sup>, W. R. Legant<sup>1</sup>, J. D. Baranski<sup>1</sup>, B. L. Blakely<sup>1</sup>, and C. S. Chen<sup>1</sup>  
<sup>1</sup>University of Pennsylvania, Philadelphia, PA

4:30PM **OP-7-3-8C - MMP-9 of Bone Marrow-Derived Cell Origin Regulates Arteriogenesis and Ischemic Skeletal Muscle Regeneration**  
J. K. Meisner<sup>1</sup>, S. S. Bajikar<sup>1</sup>, and R. J. Price<sup>1</sup>  
<sup>1</sup>University of Virginia, Charlottesville, VA

4:45PM **OP-7-3-8D - Barrier Properties and Endothelial Cells - Pericytes Interactions within Microvascular Scaffolds**  
Y. Zheng<sup>1</sup>, N. W. Choi<sup>1</sup>, A. Diaz-Santana<sup>1</sup>, M. Craven<sup>1</sup>, S. S. Verbridge<sup>1</sup>, C. Fischbach-Teschl<sup>1</sup>, and A. D. Stroock<sup>1</sup>  
<sup>1</sup>Cornell University, Ithaca, NY

- 5:00PM **OP-7-3-8E - Wrapping-and-Tapping Anastomosis between Implanted Endothelial Networks and Host Vasculature**  
G. Cheng<sup>1</sup>, S. Liao<sup>1</sup>, H-K. Wong<sup>1</sup>, D. Lacorre<sup>1</sup>, E. di Tomaso<sup>2</sup>, P. Au<sup>3</sup>, R. K. Jain<sup>1</sup>, D. Fukumura<sup>1</sup>, and L. L. Munn<sup>4</sup>  
<sup>1</sup>Massachusetts General Hospital, Boston, MA, <sup>2</sup>Novartis, Cambridge, MA, <sup>3</sup>FDA, Boston, MA, <sup>4</sup>Harvard Medical School, Charlestown, MA
- 5:15PM **OP-7-3-8F - Hemodynamic Systems Analysis of Capillary Network Remodeling During the Progression Type 2 Diabetes**  
K. F. Benedict<sup>1</sup>, G. Coffin<sup>1</sup>, E. J. Barrett<sup>1</sup>, and T. C. Skalak<sup>1</sup>  
<sup>1</sup>University of Virginia, Charlottesville, VA

Track: Orthopedic and Rehabilitation Engineering - 7-3-9

***Musculoskeletal Cell Mechanotransduction***

Chairs: Adam Hsieh, Vassilios Sikavitsas

Room 17A

- 4:00PM **OP-7-3-9A - Tenocytic Differentiation by Wharton's Jelly and Mesenchymal Stem Cells under Cyclical Stretching**  
V. I. Sikavitsas<sup>1</sup>, B. Engebretson<sup>1</sup>, W. Yates<sup>1</sup>, and R. Abousleiman<sup>2</sup>  
<sup>1</sup>University of Oklahoma, Norman, OK, <sup>2</sup>Oklahoma Medical Research Foundation, Norman, OK
- 4:15PM **OP-7-3-9B - Changes in Gene Expression of Nucleus Pulposus Cells Subjected to Distinct Load Histories *In Vivo***  
D. Hwang<sup>1</sup>, and A. H. Hsieh<sup>1,2</sup>  
<sup>1</sup>University of Maryland, College Park, MD, <sup>2</sup>University of Maryland, Baltimore, MD
- 4:30PM **OP-7-3-9C - Development of 3D Culture Conditions for Bone Marrow Mesenchymal Stem Cells**  
B. McGowan<sup>1</sup>, and J. Nagatomi<sup>1</sup>  
<sup>1</sup>Clemson University, Clemson, SC
- 4:45PM **OP-7-3-9D - Distraction Osteogenesis in Organ Culture**  
M. Saunders<sup>1</sup>, J. Van Sickels<sup>1</sup>, B. Heil<sup>1</sup>, and K. Gurley<sup>1</sup>  
<sup>1</sup>University of Kentucky, Lexington, KY
- 5:00PM **OP-7-3-9E - Tensile Stretch Inhibits BMP4 Mediated Mesenchymal Stem Cell Adipogenesis**  
J. Lee<sup>1</sup>, and J. Lim<sup>1</sup>  
<sup>1</sup>University of Nebraska, Lincoln, NE
- 5:15PM **OP-7-3-9F - Effect of Estrogen Deficiency on Osteocyte Lacunar Density and Canalicular Number**  
D. Sharma<sup>1</sup>, J. D. Levy<sup>1</sup>, S. B. Doty<sup>2</sup>, and S. P. Fritton<sup>1</sup>  
<sup>1</sup>City College of New York, New York, NY, <sup>2</sup>Hospital for Special Surgery, New York, NY

Track: Systems Biology, Bioinformatics and Computational Biology - 7-3-10

***Molecular and Cellular Design and Evolution***

Chairs: Casim Sarkar, Mike Shuler

Room 17B

- 4:00PM **OP-7-3-10A - Spatio-temporal Character of Selection and Diversity over the H3 Influenza Hemagglutinin**  
K. Pan<sup>1</sup>, and M. W. Deem<sup>1</sup>  
<sup>1</sup>Rice University, Houston, TX
- 4:15PM **OP-7-3-10B - A Forward-Genetic Screen and Dynamic Analysis of Lambda Phage Host-Dependencies Reveals an Extensive Interaction Network and a New Anti-Viral Strategy**  
N. D. Maynard<sup>1</sup>, E. Birch<sup>1</sup>, M. Gutsschow<sup>1</sup>, and M. Covert<sup>1</sup>  
<sup>1</sup>Stanford University, Palo Alto, CA
- 4:30PM **OP-7-3-10C - Interplay of Lineage-Specific Receptor and Transcription Factor during Erythropoiesis**  
S. Palani<sup>1</sup>, and C. A. Sarkar<sup>1</sup>  
<sup>1</sup>University of Pennsylvania, Philadelphia, PA

- 4:45PM **OP-7-3-10D - Robust Network Topologies for Generating Switch-like Cellular Responses**  
N. A. Shah<sup>1</sup>, and C. A. Sarkar<sup>2</sup>  
<sup>1</sup>University of Pennsylvania School of Medicine, Philadelphia, PA, <sup>2</sup>University of Pennsylvania, Philadelphia, PA
- 5:00PM **OP-7-3-10E - Cross Reactive Aptamer Microarrays, a New Approach to Differential Sensing**  
S. Stewart<sup>1</sup>, A. Syrett<sup>1</sup>, A. Ellington<sup>1</sup>, and E. Anslyn<sup>1</sup>  
<sup>1</sup>University of Texas, Austin, TX
- 5:15PM **OP-7-3-10F - Quantifying Metabolic Diversity: Environmental Constraints on Metabolic Production**  
P. A. Jensen<sup>1</sup>, and J. A. Papin<sup>1</sup>  
<sup>1</sup>University of Virginia, Charlottesville, VA

Track: Devices: Nano to Micro - 7-3-11

### **Medical Diagnostics: Nano to Micro Devices - II**

Chairs: Chang Liu, Sihong Wang

Room 16A

- 4:00PM **OP-7-3-11A - Cardiac Marker Detection Using a Nanofluidics, a Competitive Immunoassay, and Whole Blood Filtering Device**  
M. E. Benford<sup>1</sup>, M. Wang<sup>1</sup>, B. Reinemund<sup>1</sup>, T. Good<sup>2</sup>, J. Kameoka<sup>1</sup>, and G. Coté<sup>1</sup>  
<sup>1</sup>Texas A&M University, College Station, TX, <sup>2</sup>University of Maryland-Baltimore County, Baltimore, MD
- 4:15PM **OP-7-3-11B - Quantum Dot Light Emitting Diodes on Silicon as Multicolor Excitation Sources for On-Chip Multispectral Sensor**  
A. Gopal<sup>1</sup>, L. D'Amico<sup>2</sup>, K. Hoshino<sup>1</sup>, P. R. Gascoyne<sup>2</sup>, and X. J. Zhang<sup>1</sup>  
<sup>1</sup>The University of Texas at Austin, Austin, TX, <sup>2</sup>University of Texas M D Anderson Cancer Center, Houston, TX
- 4:30PM **OP-7-3-11C - Cancer Cell Assays Using Immunocapture, Subcellular Imaging, And Cell Release In GEDI Microdevices**  
J. P. Gleghorn<sup>1</sup>, S. M. Santana<sup>1</sup>, E. D. Pratt<sup>1</sup>, M. S. Loftus<sup>2</sup>, M. Jodari-Karimi<sup>2</sup>, N. H. Bander<sup>2</sup>, D. M. Nanus<sup>2</sup>, P. Giannakakou<sup>2</sup>, and B. J. Kirby<sup>1</sup>  
<sup>1</sup>Cornell University, Ithaca, NY, <sup>2</sup>Weill Cornell Medical College, New York, NY
- 4:45PM **OP-7-3-11D - Precision Microfluidic Oscillators for On-Chip Timing and Control**  
P. Duncan<sup>1</sup>, T. Nguyen<sup>1</sup>, and E. Hui<sup>1</sup>  
<sup>1</sup>University of California, Irvine, Irvine, CA
- 5:00PM **OP-7-3-11E - Label-free Microarray Imaging for Screening Infectious Diseases**  
S. Ahn<sup>1</sup>, G. Daaboul<sup>1</sup>, Q. Cao<sup>1</sup>, E. Ozkumur<sup>2</sup>, C. M. Klapperich<sup>1</sup>, M. Cabodi<sup>1</sup>, and S. Unlu<sup>1</sup>  
<sup>1</sup>Boston University, Boston, MA, <sup>2</sup>Massachusetts General Hospital, Charlestown, MA
- 5:15PM **OP-7-3-11F - Screening of Low-mass Proteins as Biomarkers for Early Detection of Ovarian Cancer Using Nanoporous Silica Chips**  
Y. Peng<sup>1</sup>, A. Carroll<sup>2</sup>, Y. Hu<sup>1</sup>, Y. Flores<sup>1</sup>, T. Tanaka<sup>1</sup>, A. Bouamrani<sup>1</sup>, A. Sood<sup>2</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, M.D Anderson Cancer Center, Houston, TX

Track: Devices: Nano to Micro - 7-3-12

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

Chairs: Tony Huang, Ketul Popat

Room 16B

- 4:00PM **OP-7-3-12A - Hollow-Core Fiberoptic Fiber Flow Characterization and Diffusion Analysis in Dermal Tissue**  
R. L. Hood<sup>1</sup>, M. A. Kosoglu<sup>1</sup>, Y. Chen<sup>1</sup>, Z. Montgomery<sup>1</sup>, and C. G. Rylander<sup>1</sup>  
<sup>1</sup>Virginia Tech, Blacksburg, VA
- 4:15PM **OP-7-3-12B - Engineering Two-dimensional Paper Networks For Improved Paper-based Assay Performance**  
E. Fu<sup>1</sup>, B. Lutz<sup>1</sup>, P. Kauffman<sup>1</sup>, and P. Yager<sup>1</sup>  
<sup>1</sup>University of Washington, Seattle, WA

- 4:30PM **OP-7-3-12C - Microfluidic Screening Chip for Detection of Circulating Tumor Cell**  
Y-Y. HUANG<sup>1</sup>, K. Hoshino<sup>1</sup>, A. Horton<sup>1</sup>, D. Malik<sup>1</sup>, J. Tam<sup>1</sup>, K. Sokolov<sup>1</sup>, E. Frenkel<sup>2</sup>, J. Uhr<sup>2</sup>, N. Lane<sup>2</sup>, and X. Zhang<sup>1</sup>  
<sup>1</sup>The University of Texas at Austin, Austin, TX, <sup>2</sup>The University of Texas Southwestern Medical Center, Dallas, TX
- 4:45PM **OP-7-3-12D - A Novel, High-throughput, Single-cell Deformability Measurement Technique for Diagnostics and Therapeutics**  
H. T. Tse<sup>1</sup>, D. R. Gossett<sup>1</sup>, S. Lee<sup>1</sup>, A. T. Clark<sup>1</sup>, and D. Di Carlo<sup>1</sup>  
<sup>1</sup>University of California Los Angeles, Los Angeles, CA
- 5:00PM **OP-7-3-12E - Measuring Oxygen Concentration Under *Staphylococcus aureus* Biofilms in Response to Chemical Gradients in a Microfluidic Device**  
A. Dhummakupt<sup>1</sup>, P. Samson<sup>1</sup>, D. Markov<sup>1</sup>, J. Wiksw<sup>1</sup>, and L. Shor<sup>2</sup>  
<sup>1</sup>Vanderbilt University, Nashville, TN, <sup>2</sup>University of Connecticut, Storrs, CT
- 5:15PM **OP-7-3-12F - Investigating Bacterial Chemotaxis Toward Human Neuroendocrinal Hormone in a Microfluidics Model**  
D. N. Kim<sup>1</sup>, M. Hegde<sup>1</sup>, D. Englert<sup>1</sup>, and A. Jayaraman<sup>1</sup>  
<sup>1</sup>Texas A&M University, College Station, TX

Track: Biomedical Engineering Education - 7-3-13

**Community Partnerships: Innovation in Engineering Education**

Chairs: Adrienne Noe

Room 14

- 4:00PM **OP-7-3-13A - Implementing Scientific Methods and Problem-Based Learning in Elementary School Classrooms**  
Y-T. Liu<sup>1</sup>, S. Hollen<sup>1</sup>, J. Toney<sup>1</sup>, T. Herbert<sup>1</sup>, and K. M. Haberstroh<sup>1</sup>  
<sup>1</sup>Brown University, Providence, RI
- 4:15PM **OP-7-3-13B - CLIMB GK-12 Fellows: Bringing BME to the K-12 Classroom**  
J. R. Weiser<sup>1</sup>, L. Austen<sup>2</sup>, and D. Putnam<sup>1</sup>  
<sup>1</sup>Cornell University, Ithaca, NY, <sup>2</sup>Southside High School, Elmira, NY
- 4:30PM **OP-7-3-13C - Middle School Students Explore Biomedical Engineering within the Context of Diabetes**  
S. M. Pearce<sup>1</sup>, V. Fitzpatrick<sup>1</sup>, J. Bazil<sup>1</sup>, J. Groh<sup>1</sup>, and A. E. Rundell<sup>1</sup>  
<sup>1</sup>Purdue University, West Lafayette, IN
- 4:45PM **OP-7-3-13D - Museum as Mechanism and Model**  
A. Hawk<sup>1</sup>  
<sup>1</sup>National Museum of Health and Medicine, Washington, DC
- 5:00PM **OP-7-3-13E - The Possibilities Beyond**  
J. V. Curley<sup>1</sup>  
<sup>1</sup>National Museum of Health and Medicine, Washington, DC
- 5:15PM **OP-7-3-13F - Synergistic Educational Endeavors with the National Museum of Health and Medicine**  
P. Fagette<sup>1</sup>  
<sup>1</sup>BMES, Ewing, NJ

Track: New Frontiers in Bioengineering - 7-3-14

**Synthetic Biology in Health and Medicine**

Chairs: J. Christopher Anderson, Christina Smolke

Room 15

- 4:00PM **OP-7-3-14A - High-throughput Screening Strategy for Protein Optimization and Virus Genome Reprogramming Using Synthetic Biology Approaches**  
J. Quan<sup>1</sup>, Z. Chen<sup>1</sup>, and J. Tian<sup>1</sup>  
<sup>1</sup>Duke University, Durham, NC

- 4:15PM **OP-7-3-14B - Development of a Constitutive Promoter Library to Evaluate and Optimize Gene Expression Levels**  
J. Ferreira<sup>1</sup>, R. Peacock<sup>1</sup>, and C. Wang<sup>1</sup>  
<sup>1</sup>Stanford University, Stanford, CA
- 4:30PM **OP-7-3-14C - Programming Gene Regulation: from Synthetic Gene Networks to Cell Differentiation**  
X. wang<sup>1</sup>  
<sup>1</sup>Arizona State University, Tempe, AZ
- 4:45PM **OP-7-3-14D - Engineering a Functional Genetic Approach for Small Molecule Characterization**  
J. R. Pritchard<sup>1</sup>, H. Jiang<sup>2</sup>, L. Gilbert<sup>1</sup>, D. Lauffenburger<sup>1</sup>, and M. Hemann<sup>1,2</sup>  
<sup>1</sup>M.I.T., Cambridge, MA, <sup>2</sup>Koch Institute, Cambridge, MA
- 5:00PM **OP-7-3-14E - Design of Anti-Cancer Bacterial Therapeutics**  
J. C. Anderson<sup>1</sup>  
<sup>1</sup>UC Berkeley, Berkeley, CA
- 5:15PM **OP-7-3-14F - Tunable Signal Processing in Synthetic MAP Kinase Modules**  
E. C. O'Shaughnessy<sup>1</sup>, S. Palani<sup>2</sup>, J. J. Collins<sup>1</sup>, and C. A. Sarkar<sup>2</sup>  
<sup>1</sup>Howard Hughes Medical Institute and Boston University, Boston, MA, <sup>2</sup>University of Pennsylvania, Philadelphia, PA

Tracks: Drug Delivery, Tissue Engineering and Cellular and Molecular Engineering - **7-3-15**

**Acta Biomaterialia Gold Medal Award Session**

Ballroom G

- 4:00PM **Advancing Biomaterial Strategies for Bone Tissue Engineering**  
Prof. Antonios G. Mikos  
*Louis Calder Professor of Bioengineering and Chemical and Biomolecular Engineering, Director of John W. Cox Laboratory of Biomedical Engineering, Director of Center for Excellence in Tissue Engineering, Rice University*
- 4:30PM **Hydrogel Matrices: Studying Biology in the Fourth Dimension**  
Prof. Kristi Anseth  
*Distinguished Professor and HHMI Investigator, Department of Chemical & Biological Engineering, University of Colorado*
- 5:00PM **Acta Biomaterialia Award Presentation: Advances in Hydrogels as Intelligent Biomaterials**  
Prof. Nicholas Peppas  
*Fletcher Stuckey Pratt Chair in Engineering, Professor of Biomedical Engineering, Chemical Engineering and Pharmacy, Chai, Department of Biomedical Engineering, The University of Texas at Austin*
- 5:20PM **Award Presentation**  
Dr. Art Coury

Track: Tissue Engineering \* - **7-3-16**

**Printing and Patterning in Tissue Engineering**

Chairs: Shashi Murthy, Celeste Nelson

Ballroom F

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

- 4:00PM **OP-7-3-16A - Ultrasound-Based Cell Patterning for the Vascularization of Three-Dimensional Engineered Tissue**  
K. A. Garvin<sup>1</sup>, D. C. Hocking<sup>1</sup>, and D. Dalecki<sup>1</sup>  
<sup>1</sup>University of Rochester, Rochester, NY
- 4:15PM **OP-7-3-16B - Engineering Epithelial/Stromal Interactions to Study Branching Morphogenesis**  
S. Manivannan<sup>1</sup>, A. Pavlovich<sup>1</sup>, and C. Nelson<sup>1</sup>  
<sup>1</sup>Princeton University, Princeton, NJ
- 4:30PM **OP-7-3-16C - Spatially Patterning Cell Adhesion Ligands in Biodegradable, Photocrosslinked Alginate Hydrogels**  
O. Jeon<sup>1</sup>, C. Powell<sup>1</sup>, and E. Alsberg<sup>1</sup>  
<sup>1</sup>Case Western Reserve University, Cleveland, OH

- 4:45PM **OP-7-3-16D - Rapid, Versatile Printing of Vascular Networks for Perfused 3D Tissue Culture**  
J. S. Miller<sup>1</sup>, M. T. Yang<sup>1</sup>, D-H. Nguyen<sup>1</sup>, and C. S. Chen<sup>1</sup>  
<sup>1</sup>University of Pennsylvania, Philadelphia, PA
- 5:00PM **OP-7-3-16E - Tissue Origami**  
G. Ye<sup>1</sup>, J-O. You<sup>1</sup>, and D. T. Auguste<sup>1</sup>  
<sup>1</sup>Harvard University, Cambridge, MA
- 5:15PM **OP-7-3-16F - Long-term Viability of Cells Encapsulated in 3D Photopatterned Hydrogels Fabricated using Stereolithography**  
P. Zorlutuna<sup>1</sup>, V. Chan<sup>1</sup>, J. Jeong<sup>1</sup>, H. Kong<sup>1</sup>, and R. Bashir<sup>1</sup>  
<sup>1</sup>University of Illinois, Urbana-Champaign, Urbana, IL