5:45PM
Comparisons of Platinum and CNT-MEA Electrodes as Peripheral Muscular Interface
C. Chen\(^1\), W. Yi\(^1\), X. Meng\(^2\), C. Zhou\(^2\), W. Wang\(^2\), B. Chen\(^2\), J. Cavanaugh\(^1\), and M. Cheng\(^2\)
\(^1\)Wayne State University, Detroit, MI, \(^2\)Tsinghua University, Beijing, China, People’s Republic of China

4:45PM
Microneedle-Array Patches Loaded with Hypoxia-Sensitive Vesicles for Rapid Glucose-Responsive Insulin Delivery

Y. Xu\(^1\), Y. Zhang\(^2\), Y. Ye\(^1\), D. Ramson\(^1\), P. Liger\(^1\), J. Buse\(^3\), and Z. Gu\(^1\),\(^2\)
\(^1\)University of North Carolina at Chapel Hill and North Carolina State University, Chapel Hill, NC, \(^2\)University of North Carolina at Chapel Hill, Chapel Hill, NC, \(^3\)University of North Carolina School of Medicine, Chapel Hill, NC

4:30PM
NanoCluster Beacons Enable Enzyme-Free N6-Methyladenine Detection

J. Obilom\(^1\), A. Stenberg\(^1\), W. Wang\(^2\), and X. Meng\(^2\)
\(^1\)University of North Carolina at Chapel Hill, Chapel Hill, NC, \(^2\)Massachusetts Institute of Technology, Cambridge, MA

Track: Bioinformatics, Computational and Systems Biology

OP-Thurs-3-15 - Room 17

From Molecules to Cells and Organs in Health and Disease

Chairs: Denise Kirschner, Jose Vilar

4:30PM
Systems Biology Track Overview
L. Saiz
\(^1\)University of California, Davis, CA

4:45PM
Quantiative Analysis of Immune Cell Cytokine Secretion Reveals Role of Cell Communication in Regulation of CXC PLGRANDS
S. Schriner\(^1\), A. Hill\(^1\), and D. Lauffenburger\(^1\)
\(^1\)Massachusetts Institute of Technology, Cambridge, MA

5:00PM
The DIONEUS Algorithm Provides Scalable and Accurate Reconstruction of Biological Networks to Reveal New Drug Target
M. Caccio\(^1\) and N. Bagher\(^1\)
\(^1\)Northwestern University, Evanston, IL

5:15PM
Release of Erythromycin from Injectable Calcium Polyporphosphate-derived Brushite Cement

W. Rovi\(^1\), W. Song\(^1\), and D. Markel\(^2\)
\(^1\)Wayne State University, Detroit, MI, \(^2\)Virotech Biomaterials Inc., Detroit, MI

5:30PM
Using Affinity Polymers for the Local Slow Release of Corticosteroids in the Treatment of Osteoarthritis

E. Rivera-Delgado\(^1\), E. Lavy\(^1\), and H. von Recum\(^1\)
\(^1\)Case Western Reserve University, Cleveland, OH

5:45PM
Asymmetric Biodegradable Microdevices for Cell-borne Drug Delivery

J. Xiu\(^1\), Z. Wang\(^2\), D. Huang\(^1\), Y. Yan\(^1\), Y. Li\(^1\), and J. Guan\(^1\)
\(^1\)Florida State University, Tallahassee, FL

Track: Nano and Micro Technologies

OP-Thurs-3-17 - Room 7-8

Nano/Microbiotechnology I

Chairs: Zi Chen, Gabe Kwong

4:30PM
Molecular Typing of Rare Trafficking Leucocytes using a Nanowire Array Microchip for Evaluating Neurodegenerative Pathology

M. Kwak\(^1\) and R. Fan\(^1\)
\(^1\)Yale University, New Haven, CT

4:45PM
Nanomagnetic Actuation: Remote Control Of Cell Signaling

J. Dobson\(^1\), H. Bini\(^1\), and A. El Haq\(^1\)
\(^1\)University of Florida, Gainesville, FL, \(^2\)Keele University, Stoke-on-Trent, United Kingdom

5:00PM
Development of Light-Induced Shape Memory Microparticles for Biomedical Applications

Q. Guo\(^1\), C. Bishop\(^2\), R. Meyer\(^1\), L. Olaso\(^1\), D. Schesinger\(^1\), J. Spicer\(^1\), J. Elisseff\(^1\), A. Kumar\(^1\), and J. Green\(^1\)
\(^1\)Johns Hopkins University, Baltimore, MD, \(^2\)Johns Hopkins University, Baltimore, China, People’s Republic of China

5:15PM
NanoCluster Beacons Enable Enzyme-Free N6-Methyladenine Detection

Y. Chen\(^1\), C. Liu\(^1\), Y. Liu\(^1\), and H-C. Yeh\(^1\)
\(^1\)University of Texas at Austin, Austin, TX
8:30AM
Development of an Optically-Guided System for Transcranial Ultrasound Neuromodulation
V. CHAPLIN1, L. CLEMENTS2, M. MIGA2, and C. CASKEY1
1Vanderbilt University Institute of Imaging Science, Nashville, TN. 2Vanderbilt University, Nashville, TN

8:45AM
Methods to Accelerate Thermal Ablation with MR-guided Focused Ultrasound
V. CHAPLIN1, P. GAURI1, P. DAYTON1, C. ARENA1, W. GRISsom1, and C. CASKEY1
1Vanderbilt University Institute of Imaging Science, Nashville, TN. 2Vanderbilt University, Nashville, TN

9:00AM
Non-Invasive Estimation Of Acoustic Attenuation For High Intensity Focused Ultrasound Treatments
S. JOHNSON1, A. FARRER1, C. DILLON1, D. CHRISTENSEN1, and A. PAYNE1
1University of Utah, Salt Lake City, UT. 2Utah Center for Advanced Imaging Research, Salt Lake City, UT

9:15AM
Development of MRI-guided Focused Ultrasound for Delivery of Neurotherapy in Mice
T. TROUARD1, M. VALDEZ2, S. YUAN3, R. RATH1, T. MATSUNAGA1, and M. ROMANOWSKI1
1University of Arizona, Tucson, AZ

9:15AM
The MRI-Targeted Delivery of Brain-Penetrating Non-Viral GDNF Gene Vectors to the Striatum with Focused Ultrasound Reverses Neurodegeneration in a Parkinson’s Disease Model
B. MEAD1, P. MASTORAKOS2, W. MILLER1, J. S. SUK3, A. KLIBANOVI, J. HANES1, and R. PRICE1
1University of Virginia, Charlottesville, VA. 2Johns Hopkins University, Baltimore, MD

Track: Bioinformatics, Computational and Systems Biology
OP-Fri-1-14 - Room 17
Multiscale Approaches
Chairs: Stacey Finley, Victor Rodgers

8:00AM
A Systems Biology Approach to Uncovering Mechanisms Governing Host-Pathogen Interactions: Tuberculosis as a Case Study (invited)
D. KIRSCHNER1
1The University of Michigan Medical School, Ann Arbor, MI

8:30AM
Hypoxia, Cancer Stem Cells, and CCR5: the Interplay In Triple-Negative Breast Cancer Invasion and Metastasis.
K.A. NORTON1, N. PANDLEY1, T. WALLACE1, and A. POPEL1
1Johns Hopkins University, Baltimore, MD

8:45AM
Validating An Agent-Based Model Of Collagen Network Remodeling
K. GOOD1 and J. REINHARDT1
1The Ohio State University, Columbus, OH

9:00AM
Agent-based Modeling Suggests Cell Contraction Drives Organization of Endometriotic Cells
T. JARACZEWSKI1, A. FLEZAR1, M. LOHR1, M. MURRELL1, and P. KREEGER1
1University of Wisconsin-Madison, Madison, WI

9:15AM
Solving Multicomponent Reaction-transport with Coupled Cellular Trajectories and Data-driven Cellular Activation Models
Y. LU1, M. Y. LEE1, T. SINNO1, and S. DIAMOND1
1University of Pennsylvania, Philadelphia, PA

Track: Drug Delivery, Tissue Engineering
OP-Fri-1-15 - Room 10
Drug Delivery in Tissue Engineering
Chairs: Elizabeth Dirk, James Moon

8:00AM
Programmable Release of Multiple Growth Factors from Aptamer-functionalized Hydrogels for Angiogenesis
Y. WANG1, M. BATTIG1, X. ZHANG1, L.J. DUAN2, and G.H. FONG2
1Penn State University, State College, PA. 2University of Connecticut Health Center, Farmington, CT

8:15AM
Engineering Extracellular Vesicles as Multifactorial Cell-Derived Delivery Vehicles for Therapeutic Vascularization
T. LAMICHHANE1, D. PATEL1, A. JEYARAM1, and S. JAY1
1University of Maryland, College Park, MD

8:30AM
On-demand Controlled Release of Acoustically-Responsive Scaffolds using Therapeutic Ultrasound
A. MONCIN1, K. J. ARLOTTA1, Q. D. KRIPFGANS1, R. T. FRANCESCHI1, A. J. PUTNAM1, and M. L. FABILLI1
1Vanderbilt University, Nashville, TN

8:45AM
Dietary Lipids and Emulsifiers Affect Particle Transport in Intestinal Mucus
J. LOCK1, T. CARR1, and R. CARRIER1
1Northeastern University, Boston, MA

9:00AM
Sustained Release of a P2X7 Receptor Antagonist Using an Injectable Nanohydrogel Improves Locomotion And Bladder Function After Spinal Cord Injury
I. YAZDI1, A. MUNOZ1, C. RIVERA1, N. TAGHPIOUR1, T. B. BOONE1, and E. TASCOTTI1
1Houston Methodist Research Institute, Houston, TX

9:15AM
DREAM TEAM & CENTER
Evaluation of Ciprofloxacin, Metronidazole Encapsulated Injectable Nanohydrogel and Self-Assembled Biomimetic Nanomatrix Gel on Enterococcus faecalis and Treponema denticola
S. KAUSHIK1, J. SCOFFIELD1, G. ALEXANDER1, A. ANDUKURI1, T. WALKER1, S. C. CHO1, B. BROTH1, H-W. JUN1, J-H. PARK1, and C. CHEON1
1University of Alabama at Birmingham, Birmingham, AL

Track: Nano and Micro Technologies
OP-Fri-1-16 - Room 7-8
Nano/Microbiotechnology II
Chairs: Mandy Esch, Wilbur Lam

8:00AM
Virus-Dendron Hybrid Nanostructures for Cell Delivery and Imaging Applications
A. WEN1, K. PANGILINAN1, P. CAO1, R. ADVINCULA1, and N. STEINMETZ1
1Case Western Reserve University, Cleveland, OH
2:00 PM
Screening Of Nanoparticles And Nanoparticle Delivery Strategies For Treatment Of Atherosclerosis Via Coated Angioplasty Balloons
R. Yer1, S. Yamana, A. E. Kurjakose1, and K. T. Nguyen1
1The University of Texas at Arlington, Arlington, TX, 2The University of Texas Southwestern Medical Center at Dallas, Dallas, TX

2:15 PM
Delivery of Paclitaxel to Arterial Segments via a Perfusion Catheter: An ex vivo and in vivo Study
M. Atighi1, E. Turner1, U. Christians1, and S. K. Yazdani1
1University of South Alabama, Mobile, AL, 2University of Colorado, Aurora, CO

2:30 PM
Evaluation of Inflammation on a Self-Assembled Nanomatrix Stent Coating In Vitro
G. Alexander1, J. Vin1, M. Collie1, P. Huang1, J. Kim1, B. Brott1, and H-W. Jun1
1University of Alabama at Birmingham, Birmingham, AL

Track: Cellular and Molecular Bioengineering
OP-Fri-2-12 - Room 5-6
Young Innovators Session II: Regenerative Medicine and Drug/Cell Delivery Processes

Chairs: Michael King

1:45 PM
Micelle Delivery of Parthenolide to Acute Myeloid Leukemia Cells
M. Baranello1, L. Bauer1, C. Jordan2, and D. Benoit1
1University of Rochester, Rochester, NY, 2University of Colorado Health Sciences Center, Denver, CO

1:57 PM
Design of a Novel 3D Printed Bioactive Nanocomposite Scaffold for Improved Osteochondral Regeneration
N. Castro1, R. Patel1, and L. G. Zhang1
1The George Washington University, Washington, DC

2:09 PM
Elastomeric Cell-laded Nanocomposite Microfibers for Engineering Complex Tissues
C. W. Peak1, J. Carrow1, A. Thakur1, A. Singh1, and A. K. Gaharwar1
1Texas A&M University, College Station, TX, 2Cornell University, Cornell, NY

2:21 PM
Engineering Synthetic Insulin-Secreting Cells Using Hyaluronic Acid Microgels Integrated with Glucose-Responsive Nanoparticles
J. Div1, J. Yu1, Y. Wu1, D. Ranson1, A. Jindal1, and Z. Gu1
1University of North Carolina at Chapel Hill and North Carolina State University, Raleigh, NC, 2University of North Carolina at Chapel Hill, Chapel Hill, NC

2:33 PM
Shape-engineering of Virus-based Nanomaterials for Applications in Medicine
N. F. Steinmetz1
1Case Western Reserve University, Cleveland, OH

Track: Biomedical Imaging and Optics, Tissue Engineering
OP-Fri-2-13 - Room 11
Applications of Imaging in Tissue Engineering

Chairs: Chris Price, Chris Bashur

1:45 PM
Single-Cell Lens-Free Imaging of Cell Migration in Diverse Microenvironments
C. Paul1, E. Mathieu2, R. Stahl2, G. Vanmeerbeeck2, K. Konstantopoulos1, and L. Lagae2
1Johns Hopkins University, Baltimore, MD, 2imec, Leuven, Belgium

2:00 PM
Development of an Optical Probe for Detection of Chondrocyte Apoptosis Following Cartilage Injury
YH. Huang1, J. Zhou1, H. Weng1, J. Borrell1, and L. Tang1
1University of Texas at Arlington, Arlington, TX, 2Texas Health Arlington Memorial Hospital, Arlington, TX

2:15 PM
In Situ Microscale Quantification of Solute Transport via Image Correlation Spectroscopy
B. Graham1, J. Shoda1, and C. Price1
1University of Delaware, Newark, DE

2:30 PM
Modified En Bloc Staining and Clearing for Improved Imaging of Musculoskeletal Cells In Situ
I. Berke1, J. Miola1, M. Smith1, and C. Price1
1University of Delaware, Newark, DE

Track: Biomedical Imaging and Optics, Tissue Engineering
OP-Fri-2-14 - Room 17
Applications of Imaging in Tissue Engineering

Chairs: Ilya Vakser, Leonor Saiz

1:45 PM
Exploring the Binding Properties of Proteins by Computational Mapping
S. Vajda1 and D. Kozakov1
1Boston University, Boston, MA

2:00 PM
Three-Dimensional Modeling of Single Stranded DNA Aptamers
I. Jedd1 and L. Saiz1
1University of California, Davis, Davis, CA

2:15 PM
Computational Modeling of General RTK Dimerization Kinetics
S. B. Mamer1 and P. I. Moukhuede1
1University of Illinois at Urbana-Champaign, Urbana, IL

2:30 PM
A Computational Model Of Cell-Generated Traction Forces And Fibronectin Assembly
D. Mair1, T. Petet1, L. Scott1, S. Weinberg2, and C. Lemmon1
1Virginia Commonwealth University, Richmond, VA, 2Old Dominion University, Suffolk, VA
**Track: Bioinformatics, Computational and Systems Biology**

**OP-Fri-3-14 - Room 17**

**Cell Signaling and Therapeutics**

**Chairs:** Jose Luis Puglis, Cheemeng Tan

**3:00PM**

Quantitative Analysis of the Akt/mTOR Signaling Axis

A. RIAHMAN1 AND J. HAUSH1

1North Carolina State University, Raleigh, NC

**3:15PM**

Druggability of Cellular Network Motifs

F. WU1, C. MA2, AND C. TAN1

1University of California Davis, Davis, CA, 2University of California, Berkeley, CA

**3:30PM**

Mechanistic Model of Angiogenesis Inhibitor Thrombospondin-1 in Cancer

S. FINLEY1

1University of Southern California, Los Angeles, CA

**3:45PM**

Dynamic Phosphorylation Signatures Following Stimulation Distinguish Latent HIV-Infected Primary CD4+ T Cells from Uninfected Cells

L. FONG1, E. SUJISTIO1, AND K. MILLER-JENSEN1

1Yale University, New Haven, CT

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**Track: Drug Delivery**

**OP-Fri-3-15 - Room 10**

**Multifunctional or Hybrid Systems**

**Chairs:** Steven Jay, Tara Deans

**3:00PM**

A Multipurpose Prevention Technology or "Virus Trap and Safety Net" for the Delivery of Antivirals, Proteins, and Oligonucleotides against STIs

K. M. TYO1, T. W. GROOMS-WILLIAMS1, N. MATOBA1, AND J. M. STEINBACH1

1University of Louisville, Louisville, KY

**3:15PM**

Polyelectrolyte Multilayers Assembled from Immune Signals Promote Antigen-specific T Cell Response

P. ZHANG1 AND C. JEWELL1, 2, 3

1University of Maryland, COLLEGE PARK, MD, 2University of Maryland Medical School, Baltimore, MD, 3Marlene and Stewart Greenebaum Cancer Center, Baltimore, MD

**3:30PM**

Multispectral PLGA Nanoparticles To Assess Cellular Uptake And Distribution In Vitro and In Vivo

D. MEDINA1, J. YAMAGUCHI1, K. HOUSEHOLDER1, T. KOVALIK1, S. BOWEN1, AND R. SIRIANI1

1Barrow Neurological Institute, Phoenix, AZ

**3:45PM**

In vivo Delivery of Transcription Factors with Multifunctional Oligonucleotides

K. LEE1, M. RAFF1, X. WANG1, R. TANG1, N. LINGAMPELLI1, AND N. MURTHY1

1University of California, Berkeley, Albany, CA, 2University of California, Berkeley, Berkeley, CA

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**Track: Nano and Micro Technologies**

**OP-Fri-3-16 - Room 7-8**

**Micro and Nano Total Analysis Systems**

**Chairs:** Beth Pruitt, Rong Fan

**3:00PM**

An Acoustofluidic Device for Liquefying Human Sputum Samples On-chip

P-H. HUANG1, L. REN1, S. LI1, AND T. J. HUANG1

1The Pennsylvania State University, University Park, PA

**3:15PM**

Enhancement of Surface Binding by Laser Heating Induced Mass Transport

B. WANG1 AND X. CHENG1

1Lehigh University, Bethlehem, PA

**3:30PM**


R. FAN1

1Yale University, New Haven, CT

**3:45PM**

A High-Throughput, Low-Volume, Sensitive Microfluidic Multiplex Immunoassay

M. GHODBANE1, E. STUCKY1, T. MAGUIRE1, R. SCHLOSS1, D. SHREIBER1, J. ZAHN1, AND M. YAMASH1, 2

1Rutgers, The State University of New Jersey, Piscataway, NJ, 2Massachusetts General Hospital, Boston, MA

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**Track: Respiratory Bioengineering**

**OP-Fri-3-17 - Room 1**

**Airway Modeling and Imaging**

**Chairs:** Bernard Sapoval, Gordana Vunjak-Novakovic

**3:00PM**

Role of Collagen Fibers in Translating Airway Smooth Muscle Force to Narrowing of Airways

H. PAHARANISHWAR1, D. MARQUIS1, K. DUVAL1, B. HARVEY1, AND K. LUTCHEN1

1Boston University, Boston, MA

**3:15PM**

Collagen Crosslinking Reagent Utilized to Stiffen Soft Palate in Equine Snoring

S. HU1, J. KUG2, M. BROYN1, AND T. HEDMAN1

1University of Kentucky, Lexington, KY, 2Orthopeutics, L.P., Lexington, KY, 3Crosscoat Medical, LLC, Lexington, KY

**3:30PM**

Patterned, Tubular Scaffolds Mimic Longitudinal and Radial Mechanics of the Neonatal Trachea

E. MANSFIELD1, V. GREENE1, AND J. AUGUST1

1The City College of New York, New York, NY

**3:45PM**

Minimizing Ventilation Heterogeneity Using Multiple Frequencies of Oscillation

J. HERMANN1, M. TAWHAP, AND D. KACZKA1

1University of Iowa, Iowa City, IA, 2University of Auckland, Auckland, New Zealand
1:30PM - 3:00PM PLATFORM SESSIONS Sat-2 2015 | OCTOBER 10 | SATURDAY

**2:00PM**
**Chemical-Genetic Inference of Antibiotic Interactions for Combination Therapies**
S. Chandrasekaran, et al.
*Harvard University, Cambridge, MA, Broad Institute of MIT and Harvard, Cambridge, MA, Massachusetts Institute of Technology, Cambridge, MA, Sabancı University, Istanbul, Turkey*

**2:15PM**
**Hypoxic Response in Age-Related Diseases: Uncovering Cellular Phenotypes**
A. Qutub, et al.
*Rice University, Houston, TX*

**2:30PM**
**Tensor GSVD Predicting Ovarian Cancer Survival and Response to Platinum-Based Chemotherapy**
T. Schmidt, et al.
*University of Utah, Salt Lake City, UT, Scientific Computing and Imaging (SCI) Institute, Salt Lake City, UT*

**2:45PM**
**Adaptive Regulation of Cancer Cell Fate Following Targeted Inhibition of the Oncogenic Pathway**
M. Fallahi-Sichani, et al.
*Harvard Medical School, Boston, MA*

**3:00PM**
**The Effects of Terminal Sterilization On the Mechanical and Biologic Properties of Extracellular Matrix Hydrogels**
A. Smoulder, et al.
*University of Pittsburgh, Pittsburgh, PA*

**3:15PM**
**Incorporation of Nano-sized Bioactive Glass Enhances the Mechanical Properties of Electrochemically Aligned Collagen Fibers**
M. Pastakia, et al.
*Florida Institute of Technology, Melbourne, FL*

**3:30PM**
**Double Wall Microsphere Controlled Delivery System for Adipose Tissue Retention and Enhancement**
C. McBride, et al.
*University of Pittsburgh Adipose Stem Cell Center, Lumberton, NJ, University of Pittsburgh, Pittsburgh, PA*

**3:45PM**
**Crosslinked Core-Shell Nanogels as Vehicles for Drug Delivery**
J. Tovislee, et al.
*Case Western Reserve University, Cleveland, OH, University of Pennsylvania, Philadelphia, PA*

**4:00PM**
**Raman Microspectroscopy Assesses Human Embryonic Stem Cell Cardiac Differentiation and Maturation**
A. Lee, et al.
*Boston University, Boston, MA, Fraunhofer Institute for Interfacial Engineering and Biotechnology (IGB), Stuttgart, Germany, Research Institute of Women's Health, University Hospital of the Eberhard Karls University, Stuttgart, Germany, Cardiovascular Research Laboratories, David Geffen School of Medicine at UCLA, Los Angeles, CA*

**4:15PM**
**Effects of Kartogenin and Thalidomide on Chondrogenesis in Mesenchymal Stem Cells and Mesenchymal Stem Cells derived from Human Induced Pluripotent Stem Cells**
M. Bloom, et al.
*University of Kansas, Lawrence, KS, National University of Ireland Galway, Galway, Ireland*

**4:30PM**
**Self-Organizing Structure Formation in High Density Neuronal Human iPSC Culture**
W. McAllister, et al.
*Georgia Institute of Technology, Atlanta, GA, The Gladstone Institutes, San Francisco, CA, University of California – San Francisco, San Francisco, CA*

**4:45PM**
**Encapsulation And Differentiation Of Human Induced Pluripotent Stem Cells To Form 3D Engineered Cardiac Tissue Using Methacrylated Gelatin**
S. Head, et al.
*Auburn University, Auburn, AL*

**5:00PM**
**Coculture of hMSCs and HUVECs to aid in prevascularization of bone tissue**
R. Moriarty, et al.
*University of Maryland- College Park, College Park, MD*