

2018 BMES MOBILE APP

Annual Meeting

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AUTHOR INDEX
 Available on the Mobile App (see ad above) at:
<http://submissions.mirasmart.com/bmes2018/itinerary>
 Copies are also available at the Registration Desk.

SCIENTIFIC PROGRAM

THURSDAY

Platform Sessions Th-1 (Thursday 8:00-9:30am)	4-13
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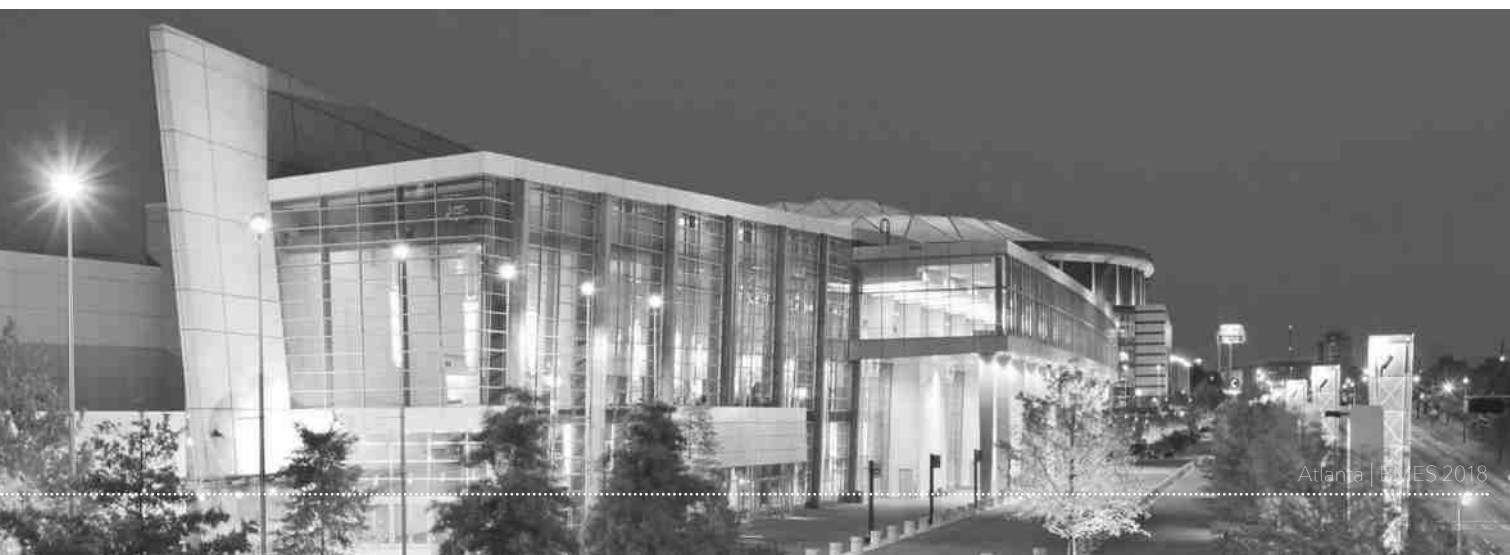
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2018 PROGRAM



THURSDAY'S SCHEDULE HIGHLIGHTS

PLATFORM SESSIONS-THURS-1

8:00 am–9:30 am Convention Center
 19 Concurrent Sessions See pages 4–13

SPECIAL SESSIONS

8:00 am–9:30 am Georgia State Room
 50th Anniversary Jeopardy

8:00 am–9:30 am Room A301
**The Future of Bioelectronics:
 Materials Processes and Applications**

8:00 am–9:30 am Room A411
**State-of-the-Art ImmunoEngineering
 and Future Opportunities**

8:00 am–9:30 am Room A310
Single Cell Analysis and Tumor Heterogeneity

INDUSTRY SESSION

8:00 am–10:00 am Room A402
Tech Transfer Innovation Challenge

STUDENT & EARLY CAREER

9:00 am–10:00 am Room A412A
**Marketing Yourself: Tips for a
 Successful Job Search**

Exhibit Hall & Posters Open

9:30 am–5:00 pm Exhibit Hall

Poster Viewing with Authors

9:30 am–10:15 am Exhibit Hall
 3:00 pm–3:45 pm

PLENARY SESSION

10:15 am–11:30 am Sidney Marcus Aud.
State of the Society



Lori Setton, PhD
BMES President



Rashid Bashir, PhD
*Pritzker Distinguished Lecture
 Department of Bioengineering
 University of Illinois*

Celebration of Minorities in BME Luncheon

11:45 am–1:15 pm Room A411



Paula Hammond, PhD
*Koch Institute for Integrative
 Cancer Research, Massachusetts
 Institute of Technology*
(ticket purchase required)

INDUSTRY SESSION

1:15 pm–3:15 pm Room A402
Entrepreneur Workshop

PLATFORM SESSIONS-THURS-2

1:30 pm–3:00 pm Convention Center
 20 Concurrent Sessions See pages 14–22

STUDENT & EARLY CAREER

1:30 pm–2:45 pm Room A412A
BME Careers in Industry I

2:30 pm–4:00 pm Exhibit Hall A,
 Career Zone
**Rapid Resume Review–
 Members Only**

3:00 pm–4:00 pm Room A412A
BME Careers in Academia

4:15 pm–5:15 pm Room A412A
BME Careers in Industry II

SPECIAL SESSIONS

1:30 pm–3:00 pm A301
NIH Funding Panel Session

1:30 pm–3:00 pm A310
**Soft Material-Enabled Electronics for
 Medicine, Healthcare and Human-
 Machine Interfaces**

2:30 pm–5:00 pm A411
**6th US-Korea Joint BMES Workshop on
 Biomedical Engineering**

PLATFORM SESSIONS-THURS-3

3:45 pm–5:15 pm Convention Center
 20 Concurrent Sessions See pages 23–31

SPECIAL SESSIONS

3:45 pm–5:15 pm Room A310
**Novel Photoacoustic Imaging:
 Systems, Computation and Agents**

3:45 pm–5:15 pm Room A301
NIBIB DEBUT Presentations and Awards

PLENARY SESSION

5:30 pm–6:30 pm Sidney Marcus
 Auditorium

Diversity Award Lecture



Anjelica L. Gonzalez, PhD
*School of Engineering and
 Applied Science,
 Yale University & BMES Fellows*
(ticket purchase required)

Industry Mixer

7:00 pm–8:30 pm STATS Brewpub
(Ticket Purchase Required)

HOSTED RECEPTIONS

8:00 pm–10:00 pm Omni Hotel

OP-Thurs-1-1

Room A311

Track: Biomaterials

Hydrogels I

Chairs: Laura Suggs, Nicole Iverson

**8:00 am–8:30 am
Hydrogels to Promote
Endogenous Repair**



Tatiana Segura¹
¹Duke University, Durham, NC

**8:30 am–8:45 am
Peptide Amphiphile-Hyaluronic Acid
Composites for Cartilage Regeneration
in a Large-Animal Model**

Jacob Lewis¹, Brett Nemke², Mark McClendon³, Yan Lu², Mark Markel²,
and Samuel Stupp¹
¹Northwestern University, Evanston, IL, ²University of Wisconsin-
Madison, Madison, WI, ³Northwestern University, Chicago, IL

**8:45 am–9:00 am
Sliding Hydrogels with Tunable Molecular
Mobility and Ligands as 3D Niche for
Accelerating MSC-based Cartilage Regeneration**

Xinming Tong¹ and Fan Yang¹
¹Stanford University, Stanford, CA

**9:00 am–9:15 am
Chronic Low-rate Contractile Activity and
Thyroid Hormone Supplementation Enhance
Structural and Functional Maturation of
Engineered Rat Myocardium**

Hanjun Li¹, Christopher Jackman¹, and Nenad Bursac¹
¹Duke University, Durham, NC

**9:15 am–9:30 am
PEGylated Laminin Hydrogels for Skeletal
Muscle Regeneration**

Natalia Ziemkiewicz¹, Muhamed Talovic¹, Lindsay Hill¹, Robert
Scheidt¹, Josh Madsen¹, Anjali Patel¹, Gabe Haas¹, Madison
Marcinczyk¹, Silviya Zustiak¹, and Koyal Garg¹
¹Saint Louis University, St. Louis, MO

OP-Thurs-1-2

Room A312

Track: Biomaterials

3D Printing I

Chairs: Rosalyn Abbott, Jesse Placone

**8:00 am–8:15 am
3D Stereolithography Using Gelatin
Methacrylate: A Novel Invasion Assay for
Multicellular Aggregates**

Daniel Sazer¹, Bagrap Grigoryan¹, Jacob Albritton¹, Amanda Avila¹,
Aparna Padhye², Don Gibbons², and Jordan Miller¹
¹Rice University, Houston, TX, ²The University of Texas MD
Anderson Cancer Center, Houston, TX

8:15 am–8:30 am

**3D Bioprinting Human Adenocarcinoma Cells
to Study Epithelial-Mesenchymal Transition**

Helen Warner¹, Mohammad Azimi¹, Taylor Scipione¹,
Suzanne Lightsey¹, Hamzah Shariff¹, Kelsey Leong¹, Kyle Lampe¹,
Shayn Peirce¹, and Matthew Lazzara¹
¹University of Virginia, Charlottesville, VA

8:30 am–8:45 am

**Bioprinted 3D Breast Epithelial Spheroids are
More Resistant to Paclitaxel than Single Cells**

Swathi Swaminathan¹, Qudus Hamid¹, Wei Sun¹, and Alisa Clyne¹
¹Drexel University, Philadelphia, PA

8:45 am–9:00 am

**3D Printing of Microstructured Collagen
Scaffolds to Guide 3D Muscle Organization**

Andrew Lee¹, Thomas Hinton¹, Andrew Hudson¹, Jacqueline Bliley¹,
and Adam Feinberg¹
¹Carnegie Mellon University, Pittsburgh, PA

9:00 am–9:15 am

**SuperFast 3D Printing of Human-Scale
Vascularized Tissue**

Nanditha Anandakrishnan¹, Hang Ye¹, Chi Zhou¹, and Ruogang Zhao¹
¹University at Buffalo, Buffalo, NY

9:15 am–9:30 am

**Orthogonal Programming of Heterogeneous
Micro-Mechano-Environments and Geometries
in 3D Bio-Stereolithography**

Yonghui Ding¹, Hang Yin¹, Xiaobo Yin¹, and Wei Tan¹
¹University of Colorado at Boulder, Boulder, CO

OP-Thurs-1-3

Room A410

Track: Cancer Technologies

Microfluidic and Microscale Cancer Models

Chairs: Steve George, Luis Solorio

8:00 am–8:15 am

**The Use of a Microfluidic Invasion Network
Device (MIND) for Glioblastoma Prognosis and
Response to Therapy**

Bin Sheng Wong¹, Sagar R. Shah^{2,3}, Christopher Yankaskas¹,
Alfredo Quiñones-Hinojosa², and Konstantinos Konstantopoulos^{1,3}
¹The Johns Hopkins University, Baltimore, MD, ²Mayo Clinic,
Jacksonville, FL, ³The Johns Hopkins University School of Medicine,
Baltimore, MD

8:15 am–8:30 am

**Gene-expression Profiling of Patient-Derived
Fibroblast and Breast Cancer Interactions
in a Three-Dimensional (3D) Organotypic
Microfluidic Platform**

Danh Truong¹, Alexander Kratz¹, Jin G. Park², Eric S. Barrientos¹,
Toan Nguyen¹, Harpinder Saini¹, Barbara A. Pockaj³,
Ghassan Mounieimne⁴, and Mehdi Nikkhal¹
¹Arizona State University, Tempe, AZ, ²Biodesign Institute, Tempe, AZ,
³Mayo Clinic, Phoenix, AZ, ⁴University of Arizona, Tucson, AZ

8:30 am–8:45 am

Leveraging Surface Plasmon Resonance to Dissect the Interfacial Properties of Nanoparticles for Tumor Penetration

Aniket Wadajkar¹, Jimena Dancy¹, Jeffrey Winkles¹, Graeme Woodworth¹, and Anthony Kim¹
¹University of Maryland School of Medicine, Baltimore, MD

8:45 am–9:00 am

NK Cell-Based Immunotherapeutic Activity Against Anti-CD20 Resistant Non-Hodgkin Lymphoma (NHL) in Microfluidic Droplets

Saheli Sarkar¹, Dashnamoorthy Ravi², Andrew Evens², and Tania Konry¹
¹Northeastern University, Boston, MA, ²Rutgers Cancer Institute of New Jersey, New Brunswick, NJ

9:00 am–9:15 am

Exploring Tumor-Associated Immunity in a Vascularized Glioblastoma-on-a-Chip Model

Xin Cui¹, Haoyu Wang¹, Dimitris Placantonakis², Matija Snuderl², and Weiqiang Chen¹
¹New York University, Brooklyn, NY, ²New York University School of Medicine, New York, NY

9:15 am–9:30 am

Single Cancer Cell Assay May Reveal Synergetic Combination of Anti-Cancer Drug Response: Case Study with Lung Cancer Cell Line

Yu Ri Nam¹, Jongchan Choi¹, and Sung Yang¹
¹Gwangju Institute of Science and Technology, Gwangju, Korea, Republic of

OP-Thurs-1-4

Room A313

Track: Biomechanics

Human Performance and Sports Biomechanics I

Chairs: Steve Rowson, Brian Stemper

8:00 am–8:15 am

Effects of Fatigue on Intermuscular Coherence During Cycling

Daniel Comaduran Marquez¹, Kartikeya Murari¹, Vinzenz von Tscharner¹, and Benno Nigg¹
¹University of Calgary, Calgary, AB, Canada

8:15 am–8:30 am

Development of a Time-Weighted Head Impact Exposure Metric

Brian Tomblin^{1,2}, Joel Stitzel^{1,2}, and Jillian Urban^{1,2}
¹Virginia Tech-Wake Forest University School of Biomedical Engineering and Sciences, Winston-Salem, NC, ²Wake Forest University Center for Injury Biomechanics, Winston-Salem, NC

8:30 am–8:45 am

The Effect of Medial-Lateral Visual Displacements on Center of Mass Shifts During Stepping Through an Immersive Virtual Environment

Lara Riem¹, Brian Schmit², and Scott Beardsley²
¹Marquette, Milwaukee, WI, ²Marquette University, Milwaukee, WI

8:45 am–9:00 am

Summary of 1599 Real World Head Impacts in 45 American Football and Boxing Athletes

Adam Bartsch¹, Rajiv Dama¹, Sergey Samorezov², Jay Alberts², Edward Benzel², Vincent Miele³, Alok Shah⁴, John Humm⁴, Michael McCrea⁴, and Brian Stemper⁴
¹Prevent Biometrics, Minneapolis, MN, ²Cleveland Clinic, Cleveland, OH, ³University of Pittsburgh Medical Center, Pittsburgh, PA, ⁴Medical College of Wisconsin & Zablocki VA Medical Center, Milwaukee, WI

9:00 am–9:15 am

Pilot Field Deployment of a Mouthpiece Sensor to Measure Head Impacts in Girls' Youth Soccer

Joel Stitzel¹, Brian Tomblin¹, Dena Kohn¹, and Jillian Urban¹
¹Wake Forest University, Winston-Salem, NC

9:15 am–9:30 am

The Relationship Between Structural Stiffness and Impact Performance of the American Football Faceguard

Alex Bina¹, Alison Balthaser¹, Noah Wright², Gregory Batt¹, and John DesJardins¹
¹Clemson University, Clemson, SC, ²Clemson University, Clemson, SC

OP-Thurs-1-5

Room A314

Track: Biomechanics, Cancer Technologies

Cancer Mechanobiology I

Chairs: Kandice Tanner, Samir Ghadiali

8:00 am–8:15 am

Microvesicles Contribute to Matrix Remodeling and Cancer Heterogeneity

Samantha Schwager¹, Lauren Hapach^{1,2}, Francois Bordeleau¹, Matthew Zanotelli^{1,2}, Marc Antonyak², Richard Cerione², and Cynthia Reinhart-King^{1,2}
¹Vanderbilt University, Nashville, TN, ²Cornell University, Ithaca, NY

8:15 am–8:30 am

Filopodia Mechanosensing in Directed Cell Migration Towards Stiffer Extracellular

Min-Cheol Kim¹, Yaron R. Silberberg², Rohan Abeyaratne¹, Roger D. Kamm^{1,2}, and H. Harry Asada^{1,2}
¹Massachusetts Institute of Technology, Cambridge, MA, ²Singapore-MIT Alliance Research Technology, Singapore, Singapore

8:30 am–8:45 am

Laser Speckle Rheology for Micro-Mechanical Imaging of Tumor-Associated Extracellular Matrix

Zeinab Hajjarian¹ and Seemantini Nadkarni¹
¹Harvard Medical School, Boston, MA

8:45 am–9:00 am

Mechano-Modulation of Cell Contractility Transmission Drives Cancer Stem Cell Phenotype

Weiyi Qian¹, Zijing Zhang¹, Apratim Bajpai¹, Kevin Guan¹, Lanqi Gong¹, and Weiqiang Chen¹
¹New York University, New York, NY

9:00 am–9:15 am

Time-Varying Stiffness and Mass Measurement of Adherent Colon Cancer Cells Around Mitosis

Olaoluwa Adeniba¹ and Rashid Bashir²
¹University of Illinois, Urbana Champaign, Urbana, IL,
²University of Illinois, Urbana Champaign, Urbana, IL

9:15 am–9:30 am

Compressive Solid Stress Influences Cell Morphology and Migration in Glioblastoma Cells

Yixiao Cui¹, Mark Calhoun¹, Eileen Elliott¹, and Jessica Winter¹
¹The Ohio State University, Columbus, OH

OP-Thurs-1-6

Room A315

Tracks: Biomedical Imaging and Instrumentation

Ultrasound Imaging

Chairs: Ken Hoyt, Craig Goergen

8:00 am–8:15 am

Focused Ultrasound-induced Mild Hyperthermia Improves Immune Cell Infiltration in a Mouse GL261 Intracranial Glioma Model

Anastasia Velalopoulou¹, Yutong Guo¹, Arpit Patel¹, Johannes Leisen¹, and Costas Arvanitis²
¹Georgia Institute of Technology, Atlanta, GA, ²Georgia Institute of Technology and Emory University, Atlanta, GA



8:15 am–8:30 am

Developing an Ultrasound/Photoacoustic Platform for Image-Guided Stem Cell Therapy in Ophthalmology

Kelsey Kubelick¹, Eric Snider¹, C. Ross Ethier¹, and Stanislav Emelianov^{1,2}
¹Georgia Institute of Technology & Emory University, Atlanta, GA,
²Georgia Institute of Technology, Atlanta, GA

8:30 am–8:45 am

Adapting Superharmonic Contrast-Enhanced Ultrasound Imaging for Clinical Applications

Thomas Kierski¹ and Paul Dayton¹
¹UNC/NCSU Joint Dept. of Biomedical Engineering, Chapel Hill, NC

8:45 am–9:00 am

Extravasation of Multifunctional Perfluorocarbon Nanodroplets In Vivo

Steven K. Yarmoska¹, Heechul Yoon², Vadakkancheril S. Jisha², Yiyang I. Zhu², Eleanor M. Donnelly², and Stanislav Y. Emelianov^{1,2}
¹Georgia Institute of Technology and Emory University, Atlanta, GA,
²Georgia Institute of Technology, Atlanta, GA

9:00 am–9:15 am

CDDO-Me + HIFU as a Potent Strategy to Prevent Progression to Lethal Prostate Cancer

Charles Kelly¹, Hakm Murad¹, Shirley Hong¹, Partha Chandra¹, Namrata Khurana¹, Debasis Mondal¹, and Damir Khismatullin¹
¹Tulane University, New Orleans, LA

9:15 am–9:30 am

Simulation of Transcranial Ultrasound Pressure Field in Non-Human Primates Based on Segmented MRI

Yixuan Huang¹, Marshal Phipps¹, Wolf Zinke¹, Charles Caskey², and Sumeeth Jonathan¹
¹Vanderbilt University, Nashville, TN, ²Vanderbilt University Medical Center, Nashville, TN

OP-Thurs-1-7

Room A316

Tracks: Biomedical Imaging and Instrumentation

Novel Optical Techniques and Devices

Chairs: Giuliano Scarcelli, Quincy Brown

8:00 am–8:15 am

Label-free Molecular Imaging with Deep Ultraviolet Hyperspectral Interferometric Microscopy



Francisco Robles¹
¹Georgia Tech and Emory University, Atlanta, GA

8:15 am–8:30 am

Monitoring the Degradation of Drug Loaded Nanoparticles Using Wide-Field Holographic Imaging

Aniruddha Ray¹, Shuoran Li¹, Tatiana Segura¹, and Aydogan Ozcan¹
¹University of California, Los Angeles, Los Angeles, CA

8:30 am–8:45 am

Development of Mobile Phone Based Transcutaneous Billirubinometer

Brandon Harrison¹, Alexander Dumont¹, Jerry So¹, Shreyas Chandragiri¹, Zack McCormick², Amy Nwaba³, Hendrik Weitkamp³, and Chetan Patil¹
¹Temple University, Philadelphia, PA, ²TrailBlazing Technologies Inc., New York, NY, ³Vanderbilt University Medical Center, Nashville, TN

8:45 am–9:00 am

The Scattering Coefficient Map Reveals Subsurface Colorectal Cancer

Yifeng Zeng¹, Rao Bin¹, William Chapman², Sreyankar Nandy¹, Rehan Rais², Ivan Gonzalez², Deyali Chatterjee², Matthew Mutch², and Quing Zhu¹
¹Washington University in St. Louis, St. Louis, MO,
²Washington University School of Medicine, St. Louis, MO

9:00 am–9:15 am

Optical Coherence Elastography for Analysis of Articular Cartilage Deformation Under Biaxial Loads

Brecken Blackburn¹, Mostafa Motavalli¹, Andrew Rollins¹, Jean Welter¹, and Joseph Mansour¹
¹Case Western Reserve University, Cleveland, OH

9:15 am–9:30 am

Multiscale Quantification of Microstructural Changes in Dermal Collagen in Young and Aged Mice

Alan Woessner¹, Jake Jones¹, Edward Sander², and Kyle Quinn¹
¹University of Arkansas, Fayetteville, AR, ²University of Iowa Iowa City, IA

OP-Thurs-1-8

Room A302

**Track: Tissue Engineering,
Cardiovascular Engineering**

Cardiovascular Tissue Engineering

Chairs: Brenda Ogle, Jeffrey Jacot

8:00 am–8:15 am

Feasibility of Transplantation of Non-Autologous Mitochondria into Cardiomyocyte

Paria Ali Pour¹ and Arash Kheradvar¹

¹University of California-Irvine, Irvine, CA

8:15 am–8:30 am

Bioprinted Cardiac Patch Composed of Cardiac-Specific Extracellular Matrix and Progenitor Cells For Heart Repair and Regeneration

Donald Bejleri¹, Roberto Gaetani², Karen Christman², and Michael Davis¹

¹Georgia Institute of Technology and Emory University, Atlanta, GA,

²University of California, San Diego, La Jolla, CA

8:30 am–8:45 am

In Vitro Modeling of Variable Heart Diseases Due to LaminA/C Mutation Via Patient Induced Puripotent Stem Cell-Derived Cardiomyocytes

Mehrsa Mehrabi¹, Mira Asad¹, Danielle Becker¹, Halida Widyastuti¹, Cecilia Nguyen¹, Linda Mccarthy¹, Michael Zaragoza¹, and Anna Grosberg¹

¹University of California, Irvine, Irvine, CA

8:45 am–9:00 am

A Tissue Engineered Blood Vessel Model for Studying Stress-Induced Endothelial Cell Senescence

Ellen Weburg¹ and George Truskey¹

¹Duke University, Durham, NC

9:00 am–9:15 am

Engineered Developmental Niche Enables Predictive Drug Screening in Human Dystrophic Cardiomyopathy

Jesse Macadangdang¹, Jason Miklas¹, Alec Smith¹, Eunpyo Choi¹, Winnie Leung¹, Yuliang Wang¹, Xuan Guan¹, Soowan Lee¹, Max Salick², Michael Regnier¹, David Mack¹, Martin Childers¹, Hannele Ruohola-Baker¹, and Deok-Ho Kim¹

¹University of Washington, Seattle, WA, ²University of Wisconsin, Madison, WI

9:15 am–9:30 am

Electromechanical Bioreactor for Cardia Tissue Engineering

Laura McCallum¹, Jason Schulte¹, and Agneta Simionescu¹

¹Clemson University, Clemson, SC

OP-Thurs-1-9

Room A305

Tracks: Device Technologies and Biomedical Robotics, Translational Biomedical Engineering

Interventional Devices and Robotics

Chairs: Hisham Sherif, Ethan Kung

8:00 am–8:15 am

In Vivo Detection of Metabolically Active Plaque using 3D Electrochemical Impedance Spectroscopy

Parinaz Abiri¹, Yuan Luo², René Packard¹, Chadi Nahal¹, Cynthia Chen¹, Mark Gutin¹, Arash Abiri¹, Yu-Chong Tai², and Tzung Hsiai¹

¹University of California, Los Angeles, Los Angeles, CA,

²California Institute of Technology, Pasadena, CA

8:15 am–8:30 am

Laparoscopic Induction Heater for Biomedical Applications

Jorge L. Castro-Torres¹, Fernando Mérida², Janet Méndez², Madeline Torres-Lugo², and Eduardo J. Juan³

¹Bioengineering Graduate Program, University of Puerto Rico-

Mayagüez, Mayagüez, Puerto Rico, ²Department of Chemical

Engineering, University of Puerto Rico-Mayagüez, Mayagüez, Puerto

Rico, ³Department of Electrical Engineering, University of Puerto Rico-

Mayagüez, Mayagüez, Puerto Rico

8:30 am–8:45 am

Interaction Force Measurement for an Insertable Laparoscopic Surgical Camera

Ning Li¹, Gregory Mancini², and Jindong Tan¹

¹The University of Tennessee, Knoxville, TN, ²UT Medical Center, Knoxville, TN

8:45 am–9:00 am

A Biohybrid Valveless Pump-Bot Powered by Skeletal Muscles

Zhengwei Li¹, Yongbeom Seo¹, Onur Aydin¹, Roger Kamm², Hyunjoon Kong¹, and Taher Saif¹

¹University of Illinois at Urbana Champaign, Urbana, IL,

²Massachusetts Institute of Technology, Cambridge, MA

9:00 am–9:15 am

Robot Semi-Automated Lumbar Laminectomy

James Cameron¹, David Kriparos¹, Muhannad Alharthi¹, Neloufar Loghmani¹, Shaza Ali¹, Laurence Bray¹, Shani Ross¹, and Mahesh Shenai²

¹George Mason University, Fairfax, VA, ²Inova Neuroscience and Spine Institute, Fairfax, VA

9:15 am–9:30 am

Smart Adaptive Clinical Assistant to Improve or Workflow and Efficiency

Richard Um¹, Rajiv Iyer², and Nicholas Theodore³

¹Johns Hopkins University, Baltimore, MD, ²Johns Hopkins Medical

Institution, Baltimore, MD, ³Johns Hopkins Medical Institution,

Baltimore, MD

OP-Thurs-1-10

Room A401

Tracks: Cardiovascular Engineering

Angiogenesis and Engineered Vascularization

Chairs: Tracy Hookway, Samuel Senyo

8:00 am–8:15 am

Scale-Encompassing Vascular Models via Laser-Induced Hydrogel Degradation

Keely Keller¹, John Sperduto¹, Jiaming Guo², David Mayerich², and John Slater¹

¹University of Delaware, Newark, DE, ²University of Houston, Houston, TX

8:15 am–8:30 am

A Small-Scale, High-Throughput Microtissue Platform to Assess Endothelial Permeability *In Vitro*

Alexandra Crampton¹, Katherine Cummins¹, and David Wood¹

¹University of Minnesota, Minneapolis, MN

8:30 am–8:45 am

Pericyte Migration in Diabetes and Quiescence

Bruce Corliss¹, Howard Ray¹, Kathleen Fitzgerald¹, Hamzah Shariff¹, Remi Prince¹, Shannan Petchul¹, Molly Kelly-Goss¹, Paul Yates¹, and Shayn Peirce¹

¹University of Virginia, Charlottesville, VA

8:45 am–9:00 am

Localization of Endothelial Cells In Heterotypic Cell Spheroids as a Tool To Accelerate Sprouting

Charlotte Vorwald¹ and J. Kent Leach^{1,2}

¹University of California, Davis, Davis, CA,

²UC Davis Health Sacramento, CA

9:00 am–9:15 am

Isolation of Angiogenic and Arteriogenic Subpopulations of CD31 + Cells

Brandon Johnson¹, Young-Doug Sohn², Ji Han², and Young-Sup Yoon²

¹Georgia Institute of Technology, Atlanta, GA, ²Emory University, Atlanta, GA

9:15 am–9:30 am

Adventitial Fibroblasts Regulate Microvascular Endothelial Cell Tube Formation in Hydrogels

Rebecca Scott^{1,2}, Kristi Kiick¹, and Robert Akins²

¹University of Delaware, Newark, DE, ²Nemours-Alfred I duPont Hospital for Children, Wilmington, DE

OP-Thurs-1-11

Room A403

Tracks: Cellular and Molecular Bioengineering

Extracellular Matrix and Biomaterials

Chairs: Catherine Whittington, Gregory Underhill

8:00 am–8:15 am

Regulation of Macrophage Inflammatory Activation by the Adhesive Microenvironment

Vijaykumar Meli¹, Thuy Luu¹, Hamza Atcha¹,

Praveen Veerasubramanian¹, Jessica Hsieh¹, and Wendy Liu¹

¹UCI, Irvine, CA

8:15 am–8:30 am

Sequential, But Not Concurrent, Cathepsin Incubation with Type I Collagen Gel and Tendon Extracellular Matrix Results in Extended Proteolysis

Akia Parks¹, Juhi Nahata¹, Naomi-Eliana Edouard², Johnna Temenoff¹,

and Manu Platt¹

¹Georgia Institute of Technology, Atlanta, GA, ²Spelman College, Atlanta, GA

8:30 am–8:45 am

Dissecting Extracellular Matrix Effects on Liver Stellate Cell Activation with High-Throughput Arrayed Microenvironments

Aidan Brougham-Cook¹, Ishita Jain¹, David Kukla², Salman Khetani², and Gregory Underhill¹

¹University of Illinois at Urbana-Champaign, Urbana, IL, ²University of Illinois at Chicago, Chicago, IL

8:45 am–9:00 am

Macrophage and Fibroblast Cross-talk in Extracellular Matrix Assembly

Claire Witherell¹, Kimheak Sao¹, Biao Han¹, Lin Han¹, Ryan Petrie¹,

and Kara Spiller¹

¹Drexel University, Philadelphia, PA

9:00 am–9:15 am

Modulation of MicroRNA-200c and MicroRNA-17 Attenuate Inflammation and Cartilage Degeneration in Temporomandibular Joint Osteoarthritis

Liu Hong¹, Min Zhu¹, Mamoru Yotsuya², David Reed³, Adil Akkouch¹,

Steve Eliason¹, and Brad Amendt¹

¹University of Iowa, Iowa City, IA, ²Tokyo Dental College, Tokyo, Japan,

³University of Illinois at Chicago, Chicago, IL

9:15 am–9:30 am

Communication Between Pancreatic Cancer and Stellate Cells Modulates Contact Guidance, Matrix Metalloproteinase Activity and Reorganization of Aligned Collagen Networks

Ian Schneider¹, Jacob Nuhn¹, Anuraag Boddupalli¹, Xin Ge²,

and Kaitlin Bratlie¹

¹Iowa State University, Ames, IA, ²University of California Riverside, Riverside, CA

OP-Thurs-1-12

Room A404

Track: Cellular and Molecular Bioengineering

Cell Migration

Chairs: Harini Sundararaghavan, Eno Ebong

8:00 am–8:15 am

Cellular Energetic Requirements During Cell Migration in Confined 3D Spaces

Matthew Zanotelli^{1,2}, Aniqua Rahman-Zaman^{1,2}, Francois Bordeleau², Jacob VanderBurgh^{1,2}, Paul Taufalele², and Cynthia Reinhart-King^{1,2}
¹Cornell University, Ithaca, NY, ²Vanderbilt University, Nashville, TN

8:15 am–8:30 am

Cell Membrane Generates 50-100 pN Integrin Tension to Mediate Cell Rear De-Adhesion During Rapid Cell Migration

Xuefeng Wang¹, Yuanchang Zhao¹, Yongliang Wang¹, and Anweshia Sarkar¹
¹Iowa State University, Ames, IA

8:30 am–8:45 am

The Interplay Between LFA-1 and Mac-1 Controls Migration Against The Direction of Flow In Neutrophils

Alexander Buffone, Jr.¹ and Daniel Hammer¹
¹University of Pennsylvania, Philadelphia, PA

8:45 am–9:00 am

Effect of Extracellular Matrix Crosslinking on Tumor Cell Migration and Transmigration

Marina Shumakovich Pranda¹, Kelsey Gray¹, Gregory Dawson¹, and Kimberly Stroka¹
¹University of Maryland, College Park, College Park, MD

9:00 am–9:15 am

Cargo Transfer from Cancer Associated Fibroblasts via Tunneling Nanotubes Promotes Collective Migration of Breast Cancer Cells

Kayla Goliwas¹, Jian Zhang¹, and Cynthia Reinhart-King^{1,2}
¹Vanderbilt University, Nashville, TN, ²Cornell University, Ithaca, NY

9:15 am–9:30 am

A Microfluidic Model of Cancer Cell Dissemination from a Tumor Site Via Electric Field

Soontorn Tuntithavornwat¹, Konstantinos Konstantopoulos¹, and Chao Wang¹
¹Johns Hopkins University, Baltimore, MD

OP-Thurs-1-13

Room A405

Track: Nano and Micro Technologies

Nanotechnologies for Nucleic Acid Detection and Exosome Analysis

Chairs: Neha Kamat, Ali Tamayol

8:00 am–8:15 am

Pre-Concentration and Electrochemical Detection of Methylated DNA for Cancer Diagnostics

Ye Sung Lee¹, Sung A Hong¹, and Sung Yang¹
¹Gwangju Institute of Science and Technology, Gwangju, Korea, Republic of

8:15 am–8:30 am

Label-Free Detection of Circulating Tumor DNA Point Mutations using a Nanoplasmonic Sensor

Amogha Tadimety¹, Yichen Zhang¹, Cathy Li¹, Gregory J. Tsongalis², and John X.J. Zhang^{1,3}
¹Thayer School of Engineering, Dartmouth College, Hanover, NH, ²Dartmouth Hitchcock Medical Center, Lebanon, NH, ³Norris Cotton Cancer Center, Lebanon, NH

8:30 am–8:45 am

Ultrasensitive MicroRNA Detection for Disease Diagnosis

Burcu Ozay¹ and Stephanie McCalla¹
¹Montana State University, Bozeman, MT

8:45 am–9:00 am

Direct miRNA Quantification by Enzymatic Elongation and Single Molecule Visualization

Lucas Smith¹, Andrew Smith¹, and Manish Kohli²
¹UIUC, Urbana, IL, ²Mayo Clinic, Rochester, MN

9:00 am–9:15 am

Exosomal MicroRNA Detection Via an Immuno-Biochip for Early Stage Non-small Cell Lung Cancer Post-Surgical Surveillance

Yunchen Yang¹, Eric Kannisto², Mary E. Reid², Guan Yu¹, Santosh Patnaik², and Yun Wu¹
¹University at Buffalo, The State University of New York, Buffalo, NY, ²Roswell Park Cancer Institute, Buffalo, NY

9:15 am–9:30 am

Lipid-Nanoprobe Functionalized Silica Nano-Structured Microdevice for Exosome Enrichment

Mackenzie Maurer^{1,2}, Yuan Wan^{1,2}, Hong-Zhang He^{1,2}, Yi-Qiu Xia^{1,2}, Si-Jie Hao^{1,2}, Wen-Long Zhang^{1,2}, Nelson Yee³, and Si-Yang Zheng^{1,2,4}
¹The Pennsylvania State University, University Park, PA, ²Penn State Materials Research Institute, University Park, PA, ³College of Medicine, Penn State Hershey Cancer Institute, The Pennsylvania State University, Hershey, PA, ⁴The Huck Institute of Life Sciences, The Pennsylvania State University, University Park, PA

OP-Thurs-1-14

Room A406

Track: Drug Delivery & Intelligent Systems

Delivery Systems for Proteins and Vaccines

Chairs: Benjamin Keselowsky, Evan Scott

8:00 am–8:15 am

Developing a Protein Platform to Improve Blood-Brain Barrier Transcytosis of Immunoglobulin G Therapeutics

Fabiana Zappala¹, Burcin Altun¹, and Andrew Tsourkas¹
¹University of Pennsylvania, Philadelphia, PA

8:15 am–8:30 am

Functional Assessment of BAR-Encapsulated Nanoparticles and Electrospun Fibers Against Oral Biofilms

Mohamed Y. Mahmoud¹, Sonali Sapare¹, Donald R. Demuth¹, and Jill M. Steinbach-Rankins¹
¹University of Louisville, Louisville, KY

8:30 am–8:45 am

Polymersomes Deliver Active Enzyme to the Brains of Felines as Treatment of Neurodegeneration

Jessica Kelly¹, Douglas Martin², and Mark Byrne³
¹Clemson University, Clemson, SC, ²Auburn University, Auburn, AL, ³Rowan University, Glassboro, NJ

8:45 am–9:00 am

An Antigen-Specific Microparticle System Ameliorates Multiple Sclerosis in a Mouse Model

Alexander Kwiatkowski¹, Joshua Stewart¹, Jonathan Cho¹, Theodore Drashansky¹, Eric Helm¹, Ashley Zuniga¹, Dorina Avram¹, and Benjamin Keselowsky¹
¹University of Florida, Gainesville, FL

9:00 am–9:15 am

Self-Adjuvanting Mannan-Nanovaccine as a General Platform for mRNA and Peptide Vaccination

Sejin Son¹, Omid C. Farokhzad², and James Moon¹
¹University of Michigan, Ann Arbor, MI, ²Harvard Medical School, Brigham and Women's Hospital, Boston, MA

9:15 am–9:30 am

Minimal Administration Of E-selectin-TRAIL Liposomes Has Therapeutic Benefits In A Mouse Model Of Metastatic Breast Cancer With Tumor Resection.

Nidhi Jyotsana¹, Zhenjiang Zhang¹, Fang Yu¹, and Michael R. King¹
¹Vanderbilt University, Nashville, TN

OP-Thurs-1-15

Room A407

Track: Bioinformatics, Computational and Systems Biology, Cellular and Molecular Bioengineering

Analysis of Cell Signaling

Chairs: Kelly Arnold, Melissa Kemp

8:00 am–8:15 am

Kinetic Analysis of Natural Killer Cell Cytotoxicity

Sahak Makaryan¹ and Stacey Finley¹
¹University of Southern California, Los Angeles, CA

8:15 am–8:30 am

PDGF-BB:VEGFR2 Cross-Family Binding Modulates Sustained VEGFR2 Occupancy due to High [PDGF:BB]

Colin Castleberry¹, Spencer Mamer¹, and Princess Imoukhuede¹
¹University of Illinois at Urbana-Champaign, Urbana, IL

8:30 am–8:45 am

Multivariate Analysis Identifies Neuronal Inflammatory Signaling after Mild Traumatic Brain Injury

Alyssa Pybus¹, Sitara Sankar¹, Amanda Liew², Bharat Sanders², Kyle Cowdrick², Erin Buckley^{1,2}, and Levi Wood¹
¹Georgia Institute of Technology, Atlanta, GA, ²Emory University, Atlanta, GA

8:45 am–9:00 am

Feedback Loops at the Level of Lipid Metabolism Enhance Sensitivity and Robustness in Models of Chemotactic Gradient Sensing

Jamie Nosbisch¹, Krithika Mohan¹, Timothy Elston², James Bear³, and Jason Haugh¹
¹North Carolina State University, Raleigh, NC, ²UNC School of Medicine, Chapel Hill, NC, ³UNC Lineberger Comprehensive Cancer Center, Chapel Hill, NC

9:00 am–9:15 am

Single Cell Experiments to Understand the Regulation of Crosstalk in Budding Yeast

Taylor D. Scott¹, Ping Xu², and Megan Nicole McClean¹
¹University of Wisconsin-Madison, Madison, WI, ²Princeton University, Princeton, NJ

9:15 am–9:30 am

A Method for Coupling Agent-based Models of Tissue Fibrosis to Logic-based Models of Intracellular Signaling

Michaela Rikard¹, Jia-Jye Lee¹, Thomas Athey², Shayn Peirce¹, Jeffrey Saucerman¹, and Jeffrey Holmes¹
¹University of Virginia, Charlottesville, VA, ²Johns Hopkins University, Baltimore, MD

OP-Thurs-1-16

Room A303

Track: Neural Engineering

Neural Device Interfaces

Chairs: Ryan Koppes, Mario Romero Ortega

8:00 am–8:15 am

Effect of Device Size on Tissue Damage and Gait Function After Implantation in Rat Sciatic Nerve

Rebecca Frederick¹, Samuel Bredeson², Aswini Kanneganti¹, Geetanjali Bendale¹, Mario Romero-Ortega¹, Philip Troyk², and Stuart Cogan¹
¹The University of Texas at Dallas, Richardson, TX, ²Illinois Institute of Technology, Chicago, IL

8:15 am–8:30 am

Conformal Electrode Arrays for Acute *In Vivo* Recordings of the Enteric Nervous System

Melanie Ecker¹, Edgar Guerrero Ruiz¹, Ovidio Rodriguez-Lopez¹, and Walter Voit¹
¹The University of Texas at Dallas, Richardson, TX

8:30 am–8:45 am

See-Shells: Cranial Prostheses for Pan-cortical Neural Interfacing

Leila Ghanbari¹, Russell Carter¹, Mathew Rynes¹, Judith Dominguez¹, Jay Hu¹, Nahom Mossazghi¹, Michael Laroque¹, Timothy Ebner¹, and Suhasa Kodandaramaiah¹
¹University of Minnesota, Minneapolis, MN

8:45 am–9:00 am

Fully Implantable, Battery-free Wireless Optofluidic Devices for *In Vivo* Pharmacology and Optogenetics

Raza Qazi¹, Kyung Nim Noh², Sung Il Park³, Zhanan Zou¹, Aaron D. Mickle⁴, Jose G. Grajales-Reyes⁴, Kyung-In Jang⁵, Robert W. Gereau IV⁴, Jianliang Xiao¹, John A. Rogers⁶, and Jae-Woong Jeong⁷
¹University of Colorado Boulder, Boulder, CO, ²University of Illinois at Urbana-Champaign, Urbana, IL, ³Texas A&M University, College Station, TX, ⁴Washington University School of Medicine, St. Louis, MO, ⁵Daegu Gyeongbuk Institute of Science and Technology (DGIST), Daegu, Korea, Republic of, ⁶Northwestern University, Evanston, IL, ⁷Korea Advanced Institute of Science and Technology (KAIST), Daejeon, Korea, Republic of

9:00 am–9:15 am

Photoacoustic Microelectrode Pipette for Single Cell Recordings

Christopher Miranda¹ and Barbara Smith¹
¹Arizona State University, Tempe, AZ

9:15 am–9:30 am

Investigating and Modulating Inflammation and Apoptosis Pathways on Brain Tissue Responses to Implanted Electrodes

Asiyeh Golabchi¹, Jinho Kim², Diane Carlisle², Takashi Kozai¹, Robert Friedlander², and Tracy Cui¹
¹University of Pittsburgh, Pittsburgh, PA, ²UPMC Neurological Institute, Pittsburgh, PA

OP-Thurs-1-17

Room A304

Track: Translational Biomedical Engineering

Tissue Biofabrication and Cell Therapies

Chairs: Alice Tomei, Roche de Guzma

8:00 am–8:30 am

Challenges in the Development and Translation of Insulin-Secreting Cell Products for Diabetes Treatment

INVITED

Alice Tomei¹
¹University of Miami

8:30 am–8:45 am

Rapid hiPSC Encapsulation to Produce Cardiac Tissue Spheroids using a Novel Microfluidic Device

Ferdous Finklea¹, Petra Kerscher¹, Wen Seeto¹, Yuan Tian¹, and Elizabeth Lipke¹
¹Auburn University, Auburn, AL

8:45 am–9:00 am

Development of Liver Organoids to Study FADS and ELOVL Gene-Diet Interactions

Charlotte Mae Waits¹, Andrea Mazzocchi^{1,2}, Hemamylammal Sivakumar², Susan Sergeant³, Aleksander Skardal^{1,2}, and Elaheh Rahbar¹
¹Wake Forest School of Medicine, Winston-Salem, NC, ²Wake Forest School of Medicine, Winston-Salem, NC, NC, ³Wake Forest University School of Medicine, Winston-Salem, NC

9:00 am–9:15 am

Old Age Hinders the Ability of Decellularized Muscle Matrix to Promote Myoblast Differentiation and Fusion

Lucas Olson¹, Michael McClure¹, Mashaba Rashid¹, Rebecca Heise¹, Barbara Boyan^{1,2}, and Zvi Schwartz^{1,3}
¹Virginia Commonwealth University, Richmond, VA, ²Georgia Institute of Technology, Atlanta, GA, ³University of Texas Health Science Center at San Antonio, San Antonio, TX

9:15 am–9:30 am

New MicroRNA Biotechnology Promotes Rapid And Dense Craniofacial Bone Regeneration

Brad Amendt¹, Nathan Holton¹, Steven Eliason¹, Adil Akkouch¹, and Liu Hong¹
¹University of Iowa, Iowa City, IA

OP-Thurs-1-18

Room A408

**Tracks: Stem Cell Engineering,
Tissue Engineering**

Stem Cells in Tissue Engineering

Chairs: Stephanie Willerth, Krishanu Saha

8:00 am–8:15 am

Granulopoietic Expansion of Hematopoietic Stem and Progenitor Cells in a *Staphylococcus Aureus* Infected Wound Rescues Immunocompromised Mice

Leif Anderson¹, Lloyd Miller², and Scott Simon¹
¹UC Davis, Davis, CA, ²Johns Hopkins, Baltimore, MD

8:15 am–8:30 am

Sphingolipid Signaling Facilitates Bone Repair via Mesenchymal Stem Cell Mobilization

Jada Selma¹, Anusuya Das², Anthony Awojoodu¹, Tiffany Wang¹, Anjan Kaushik², Qunjun Cui², Hannah Song¹, Molly Ogle¹, Claire Olingy¹, Emily Pendleton³, Kayvan Tehrani³, Luke Mortensen³, and Edward Botchwey¹
¹Georgia Institute of Technology, Atlanta, GA, ²University of Virginia, Charlottesville, VA, ³University of Georgia, Athens, GA

8:30 am–8:45 am

Induction of Definitive Endoderm from Human Pluripotent Stem (hPS) Cells

Saber Meamardoost¹ and Natesh Parashurama¹
¹University at Buffalo, The State University of New York, Buffalo, NY

8:45 am –9:00 am

Maturation of Stem Cell-Derived Human Hepatocytes in a Novel Microfluidic Device

Grace Brown¹, Brenton Ware¹, and Salman Khetani¹
¹University of Illinois at Chicago, Chicago, IL

9:00 am–9:15 am

Normoglycemia Following hPPC Derived Immature Beta Cell Transplantation on Microporous Scaffolds

Daniel Clough¹, Richard Youngblood¹, Tadas Kasputis¹, and Lonnie D. Shea¹
¹University of Michigan, Ann Arbor, MI

9:15 am–9:30 am

Controlling Stem Cell Fate in 3D Using Morphogen Gradients in a Hydrogel

Brian O'Grady¹, Daniel Balikov¹, Emma Hollmann¹, Ethan Lippmann¹, and Leon Bellan¹
¹Vanderbilt, Nashville, TN

OP-Thurs-1-19

Room A409

Track: Respiratory Bioengineering, Drug Delivery & Intelligent Systems

Advances in Respiratory Drug Delivery & Tissue Engineering

Chairs: Jyothi Menon, Yun Wu

8:00 am–8:15 am

DNA-Loaded Mucus-Penetrating Particles for Gene Therapy of Muco-Obstructive Lung Diseases

Namho Kim^{1,2}, Jason Rodriguez², Alessandra Livraghi-Butrico³, Richard Boucher³, Marina Mazur⁴, Susan Birket⁴, Steven Rowe⁴, Taylor Evans², Neeraj Sharma², Justin Hanes^{1,2}, and Jung Soo Suk²
¹Johns Hopkins University, Baltimore, MD, ²Johns Hopkins University School of Medicine, Baltimore, MD, ³University of North Carolina at Chapel Hill, Chapel Hill, NC, ⁴University of Alabama at Birmingham, Birmingham, AL

8:15 am–8:30 am

Delivery of Anti-microRNA-21 by Cationic Lipoplexes in Idiopathic Pulmonary Fibrosis Treatment

Lingyue Yan¹, Ruogang Zhao¹, and Yun Wu¹
¹University at Buffalo, The State University of New York, Buffalo, NY

8:30 am–8:45 am

Replenishing Lost Matrix Components in Decellularized Lungs to Drive Alveolar Barrier Formation

Bethany Young¹ and Rebecca Heise¹
¹Virginia Commonwealth University, Richmond, VA

8:45 am–9:00 am

Sex-Specific Differences in Human Neonatal Pulmonary Endothelial Cell Metabolism and Angiogenesis

Jasmine Shirazi¹, Brielle Hayward-Piatkovskyi¹, Sienna Pyle¹, Krithika Lingappan², and Jason Gleghorn¹
¹University of Delaware, Newark, DE, ²Baylor College of Medicine, Houston, TX

9:00 am–9:15 am

Engineering Spatial Heterogeneity Of Fibrosis in Organotypic Models of Human Small Airway Injury

Mark Mondrinos¹, Yoon-Suk Yi¹, Matthew Osborn¹, Woo Byun¹, and Dongeun Huh¹
¹University of Pennsylvania, Philadelphia, PA

9:15 am–9:30 am

Image-Guided Selective Replacement of Airway Epithelium for Donor Lung Regeneration

Jinho Kim¹, John O'Neill¹, N. Valerio Dorrello¹, Ahmed Hozain¹, Meghan Pinezich¹, Matthew Bacchetta¹, and Gordana Vunjak-Novakovic¹
¹Columbia University, New York, NY

SPECIAL SESSIONS

8:00 am–9:30 am

Room A301

The Future of Bioelectronics: Materials, Processes and Applications

Chairs: Tzahi Cohen-Karni, Jonathan Rivnay

The bioelectronics field encompasses a broad range of materials and devices. This symposium will highlight efforts in the field including organic and low dimensional carbon-based bioelectronic materials and devices for biosensing, diagnostics, actuation, drug delivery, and active tissue engineering. Focus will also be placed on both active and passive materials and processes meant to impart flexible, conformal, stretchable, and/or transient/degradable functionality. This symposium intends to further emphasize the need for cross-disciplinary efforts in the development of next-generation bio-integrated electronics by bringing together more fundamental research efforts with those of industrial participants – highlighting systems-level challenges (power and signal transmission/communication) and rising clinical needs.

Neuron-Like Electronics: A New Paradigm for Noninvasive Brain Probes

Charles Lieber¹

¹Harvard University, Cambridge, MA

Biomimetic Strategies Towards Seamless Neural Electronics-Tissue Integration

Tracy Cui¹

¹University of Pittsburgh, Pittsburgh, PA

High-Density Flexible Optoelectrical Neural Implants

Maysam Chamanzar¹

¹Carnegie Mellon University, Pittsburgh, PA

3D Printed Functional Materials & Devices

Michael McAlpine¹

¹University of Minnesota, Minneapolis, MN

SPECIAL SESSIONS

8:00 am–9:30 am

Room A411

State-of-the-Art ImmunoEngineering and Future Opportunities

Chairs: Julia Babensee, Susan Thomas, Shadi Mamaghani

The symposium will bring forth thought-leaders in immunoEngineering to present state-of-the-art research and opportunities for future directions. Topics to be covered will represent the breath to which immunology intersects with different areas of biomedical engineering such as imaging, biomechanics, biomaterials and computational biology. ImmunoEngineering is a very timely subject of great interest to many bioengineers as well as the funding agency, National Institutes of Health (NIH). The National Institute for Biomedical Imaging and Bioengineering (NIBIB) recently established the first ImmunoEngineering program at NIH. At this gathering of biomedical engineers, a panel discussion will be facilitated by the NIH representative, with the panel consisting of the four speakers and two co-chairs. The purpose of this discussion is to foster ideas from panelists and the audience. Issues to consider include opportunities for further engagement of the biomedical engineering community in immunoEngineering, identify gaps and opportunities for collaboration amongst the community and with immunologists, and how NIH programs can support such endeavors. The NIBIB is of the view that the biomedical engineering community can utilize their expertise and out-of-box solutions to help immunologists, cancer biologists or HIV experts to address unresolved issues that will benefit from a multidisciplinary team-based approach.

8:00 am–9:30 am

Room A310

Single Cell Analysis and Tumor Heterogeneity

Chairs: Sunitha Nagrath, Lydi Sohn

The tumor heterogeneity is a critical factor in understanding the biology of aggressive tumors and mechanisms underlying resistance to an expanding repertoire of targeted therapies in cancer. The session will focus on technology developments and the data analytics for single cell analysis to explore the tumor heterogeneity. The session will highlight important areas of single cell analysis including technologies and tools related to single cell isolation and single cell analytical methods (RNA, DNA, protein).

OP-Thurs-2-1

Room A311

Track: Biomaterials

Hydrogels II

Chairs: Laura Suggs, Nicole Iverson

1:30 pm–1:45 pm

Engineering a Cryogel-supported 3D Tumor Microenvironment for Cancer Research

Sidi A Bencherif^{1,2,3}, Thibault Colombani¹, and Mahboobeh RezaeeYazdi¹

¹Northeastern University, Boston, MA, ²Harvard University, Cambridge, MA, ³Sorbonne University, UTC CNRS UMR, BMBI, Compiègne, France, Compiègne, France

1:45 pm–2:00 pm

Controlled Mechanical Rigidity Of Printable Collagen Microgels in a Readily-adopted Screening Format

Carley Ort¹, Yimai Chen¹, and Christopher Moraes¹

¹McGill University, Montréal, QC, Canada

2:00 pm–2:15 pm

Dual-Functional Biomimetic Matrix Supports Early Stage Folliculogenesis *In Vitro*

Claire Tomaszewski¹, Elizabeth Constance¹, Hong Zhou¹, Melissa Lemke¹, Kelly Arnold¹, and Ariella Shikanov¹

¹University of Michigan, Ann Arbor, MI

2:15pm–2:30 pm

Native Nanosilicate Therapeutic Potential and Delivery of Pro-Angiogenic Factors

Charles Peak¹, David Howell¹, Kayla Bayless¹, and Akhilesh Gaharwar¹

¹Texas A&M University, College Station, TX

2:30 pm–2:45 pm

Macroporous Microribbon Hydrogels with Tunable Extracellular Matrix Compositions Induce Robust Osteogenesis of Mesenchymal Stem Cells in 3D

Xinming Tong¹, Lauren Watkins¹, Ioannis Eugenis¹, and Fan Yang¹

¹Stanford University, Stanford, CA

2:45 pm–3:00 pm

PEG-Protein Hydrogels Enhance *In Vitro* Osteogenic Mineralization in MC3T3 Preosteoblast Cells

Kristopher White¹ and Ronke Olabisi¹

¹Rutgers, Piscataway, NJ

OP-Thurs-2-2

Room A312

Track: Biomaterials

3D Printing II

Chairs: Rosalyn Abbott, Jesse Placone

1:30 pm–1:45 pm

Post-Extrusion Yield Strength as a Key Material Attribute on Structural Stability in Bioprinting

Tao Jiang¹ and Joseph Kinsella²

¹McGill University, Montréal, QC, Canada, ²McGill University, Montreal, QC, Canada

1:45 pm–2:00 pm

Print Orientation and Part Geometries Modulate Mechanical Performance of Laser Sintered Polycaprolactone Implants

Harsha Ramaraju¹, Kishan Pithadia¹, Sarah Jo Crotts¹, Colleen Flanagan², Glenn Green², and Scott Hollister¹

¹Georgia Institute of Technology, Atlanta, GA,

²University of Michigan, Ann Arbor, MI

2:00 pm–2:15 pm

Developing High Fidelity 3D Printed Biomaterial Constructs Using Hierarchical Machine Learning And Bayesian Statistical Analysis

Jennifer Bone¹ and Newell Washburn¹

¹Carnegie Mellon University, Pittsburgh, PA

2:15 pm–2:30 pm

Peptide-Functionalized 3D-Printed Scaffolds for Osteochondral Regeneration

Paula Camacho¹, Hafiz Busari¹, Peter Schwarzenberg¹, Anne Behre¹,

William G. De Long, Jr², Hannah L. Dailey¹, and Lesley W. Chow¹

¹Lehigh University, Bethlehem, PA, ²St. Luke's University Health Network, Bethlehem, PA

2:30 pm–2:45 pm

3D Printing of Packed Microgel Inks for Biomedical Applications

Kwang Hoon Song¹, Christopher Highley¹, Andrew Daly¹, and Jason Burdick¹

¹University of Pennsylvania, Philadelphia, PA

2:45 pm–3:00 pm

Optimization of Gelatin-Alginate Bioink Printability Using Rheological Parameters

Gregory Gillispie^{1,2}, Joshua Copus^{1,2}, Anil Asari², Teng Gao², James Yoo^{1,2}, Anthony Atala², and Sang Jin Lee^{1,2}

¹Virginia Tech-Wake Forest School of Biomedical Engineering Sciences, Winston-Salem, NC, ²Wake Forest Institute for Regenerative Medicine, Winston-Salem, NC

OP-Thurs-2-3

Room A410

Track: Cancer Technologies

Tumor Metastasis

Chairs: Susan Thomas, Jennifer Leight

1:30 pm–1:45 pm

Mechanochemical Disruption Via HIFU and Ethanol Eliminates Liver Cancer *In Vitro* and *In Vivo*

Emma Bortz¹, Hakm Murad¹, Gray Halliburton¹, Charles Kelly¹, and Damir Khismatullin¹

¹Tulane University, New Orleans, LA

1:45 pm–2:00 pm

Tumor Mechanical Environment Differentially Regulates Cell Cycle Progression During Cancer Invasion

Jian Zhang¹ and Cynthia Reinhart-King^{1,2}

¹Vanderbilt University, Nashville, TN, ²Cornell University, Ithaca, NY

2:00 pm–2:15 pm

Quantification of Single Cell Velocities to Investigate Cancer Metastasis **INVITED**

Susan Thomas¹, Erin Edwards¹, Meghan O'Melia¹, Jaehe Oh¹, and Katherine Birmingham¹
¹Georgia Institute of Technology, Atlanta, GA

2:15 pm–2:30 pm

E-Cadherin Facilitates Breast Cancer Metastasis in Non-Motile Phenotypically Sorted Subpopulation.

Lauren A. Hapach^{1,2}, Shawn P. Carey¹, Zachary E. Goldblatt¹, Thong M. Cao^{1,2}, Devika Pokhriyal¹, Jiahe Li¹, Francois Bordeleau², Michael R. King², and Cynthia A. Reinhart-King^{1,2}
¹Cornell University, Ithaca, NY, ²Vanderbilt University, Nashville, TN

2:30 pm–2:45 pm

Effects of Inductive Electric Fields on TNBC Cell Motility

Ayush Arpit Garg¹, Travis Jones¹, Sanjay Mishra¹, Sarah Bushman¹, Dinesh Ahirwar¹, Jessica Ferree¹, Prabhat Kumar¹, Ramesh Ganju¹, Vish Subramaniam¹, and Jonathan Song¹
¹The Ohio State University, Columbus, OH

2:45 p–3:00 pm

Tumor (Lymph)angiogenesis Affects Size-Regulated Molecular Dissemination to Lymph Node Immune Cells

Meghan O'Melia¹, Nathan Rohner¹, and Susan N. Thomas¹
¹Georgia Institute of Technology, Atlanta, GA

OP-Thurs-2-4

Room A313

Track: Biomechanics

Human Performance and Sports Biomechanics II

Chairs: Steve Rowson, Brian Stemper

1:30pm–1:45 pm

Comparative Reliability Analysis of Three Gait Initiation Detection Algorithms for Participants with Parkinson's

Aisha Moore¹, Sandhya Selvaraj¹, Shadnaz Asgari¹, and Vennila Krishnan¹
¹California State University Long Beach, Long Beach, CA

1:45 pm–2:00 pm

Postural Control During Dual Task Interference in a Youth Population

Eamon Campolettano¹, Michael Madigan¹, and Steven Rowson¹
¹Virginia Tech, Blacksburg, VA

2:00 pm–2:15 pm

An Objective Evaluation System for Assessing the Efficacy of Bicycle Helmets

Megan Bland¹, Craig McNally¹, and Steven Rowson¹
¹Virginia Tech, Blacksburg, VA

2:15 pm–2:30 pm

Effects of Unilateral and Bilateral Load Carriage of a Backpack on Single Stance Durations

Valeria Abarca¹, Erin Bond¹, Wilford Eiteman-Pang¹, Celeste Kim¹, and Rahul Soangra¹
¹Chapman University, Orange, CA

2:30 pm–2:45 pm

Does intensity of Physical Activity Affect Sleep Quality?

Nicholas Bowden¹, Yagnesh Desai¹, Sam Ha¹, Eric Lee¹, and Rahul Soangra¹
¹Chapman University, Orange, CA

2:45 pm–3:00 pm

Development of a Finite Element Football Helmet Model and a Comparison of CORA to Head Injury Biomechanical Metrics

Will Decker^{1,2}, Alex Baker^{1,2}, Xin Ye^{1,2}, and F. Scott Gayzik^{1,2}
¹Wake Forest School of Medicine, Winston-Salem, NC, ²Virginia Tech-Wake Forest University Center for Injury Biomechanics, Winston-Salem, NC

OP-Thurs-2-5

Room A314

Track: Biomechanics, Cancer Technologies

Cancer Mechanobiology II

Chairs: Kandice Tanner, Michael Mak

1:30 pm–1:45 pm

Bleb Formation via Laminar Hole Nucleation

Dan Deviri¹, Charlotte Pfeifer², Dennis Discher², and Sam Safran¹
¹Weizmann Institute of Science, Rehovot, Israel, ²University of Pennsylvania, Philadelphia, PA

1:45 pm–2:00 pm

Tumor-Agarose Gel Model Revealing Perturbation of Tumor Shape as a Dynamic Interplay Between Cancer Cells and Matrix

Xiangyu Gong¹, Rufeng Ma¹, Rachel Dass¹, Jordan Cabahug-Almonte¹, Maya Navabi¹, and Kristen Mills¹
¹Rensselaer Polytechnic Institute, Troy, NY

2:00 pm–2:15 pm

The Growth of Tumor Emboli Within Vessel Like Mimics

Jonathan Kulwatno¹, Nora Herzog¹, Matthew Getzin¹, Mihaela Skobe², and Kristen Mills¹
¹Rensselaer Polytechnic Institute, Troy, NY, ²Icahn School of Medicine at Mount Sinai, New York, NY

2:15 pm–2:30 pm

Mechano-Responsive Stem Cells to Target Cancer Metastases Through Biophysical Cues

Weian Zhao¹, Linan Liu¹, and Shirley Zhang¹
¹University of California, Irvine, Irvine, CA

2:30 pm–2:45 pm

Force Driving In Vitro Metastasis of Multicellular Epithelium

Sulin Zhang¹, Yao Zhang², and Tiankai Zhao¹
¹Penn State University, University Park, PA, ²Northwestern University, Evanston, IL

2:45 pm–3:00 pm

Cancer Cells in 3D ECMs Exhibit Mismatch in Intracellular and Extracellular Mechanics

Jack Staunton¹ and Kandice Tanner¹
¹NIH, Bethesda, MD

OP-Thurs-2-6

Room A315

Tracks: Biomedical Imaging and Instrumentation

Photoacoustic Imaging

Chairs: Muyinatu Bell, Geoffrey Luk

1:30 pm–1:45 pm

Multimodal Tomographic Fluorescent and Photoacoustic Imaging of Placental Function

Jaclyn Sider¹, Chengxi Wu¹, Rachel Hirsch², Sergey Ermilov², and Carolyn Bayer¹

¹Tulane University, New Orleans, LA, ²PhotoSound Technologies, Inc., Houston, TX

1:45 pm–2:00 pm

Tracking Stem Cell Viability using Photoacoustic Imaging

Kabir Dhada¹, Derek Hernandez¹, and Laura Suggs¹

¹University of Texas At Austin, Austin, TX

2:00 pm–2:15 pm

Tracking Vaccine Particle Trafficking to the Lymph Node using Ultrasound/Photoacoustic Imaging Tools

Kelsey Kubelick¹, Pallab Pradhan¹, Krishnedu Roy¹, and Stanislav Emelianov^{1,2}

¹Georgia Institute of Technology & Emory University, Atlanta, GA,

²Georgia Institute of Technology, Atlanta, GA

2:15 pm–2:30pm

Targeted Photoacoustic Flow System for the Detection of Circulating Ovarian Tumor Cells

Joel Lusk¹, Christopher Miranda¹, Matthew Chrest¹, Madeleine Howell¹, and Barbara Smith¹

¹Arizona State University, Tempe, AZ

2:30 pm–2:45 pm

Photoacoustic Monitoring of Renal Tissue Injury and Cavitation Detection in Shockwave Lithotripsy

Mucong Li¹, Bangxin Lan¹, Wei Liu¹, Pei Zhong¹, and Junjie Yao¹

¹Duke University, Durham, NC

2:45 pm–3:00 pm

Multi-Wavelength Freehand Three-Dimensional Photoacoustic Tomography

Ye Zhan¹ and Jun Xia¹

¹University at Buffalo, Buffalo, NY

OP-Thurs-2-7

Room A316

Tracks: Biomedical Imaging and Instrumentation, Cancer Technologies

Cancer Imaging

Chairs: Narasimhan Rajaram, Baowei Fe

1:30 pm–1:45 pm

Skin Tumor Surgical Margin Detection Using Raman Spectroscopy

Xu Feng¹, Matthew Fox², Jason Reichenberg², Fabiana Lopes², Katherine Sebastian², Mia Markey¹, and James Tunnell¹

¹Dept. of Biomedical Engineering, The University of Texas at Austin, Austin, TX, ²Dell Medical School, The University of Texas at Austin, Austin, TX

1:45 pm–2:00 pm

Immunofunctional Photoacoustic Imaging for Assessment of Metastatic Lymph Nodes

Diego Dumani¹, In-Cheol Sun¹, and Stanislav Emelianov¹

¹Georgia Institute of Technology & Emory University, Atlanta, GA

2:00 pm–2:15 pm

Development of a Near-Infrared Daratumum-Ab-Based Contrast Agent for Preclinical Imaging Of CD38 Expression in Multiple Myeloma

Nicholas Cho^{1,2}, Anchal Ghai², and Monica Shokeen^{1,2}

¹Washington University in St. Louis, St. Louis, MO,

²Washington University in St. Louis School of Medicine, St. Louis, MO

2:15 pm–2:30 pm

Automated Detection of Squamous Cell Carcinoma from Head and Neck Cancer Patients in Digitized Whole-Slide Histological Images Using Deep Learning

Martin Halicek¹, Maysam Shahedi², Xu Wang³, James Little³, Mihir Patel³, Christopher Griffith³, Mark El-Diery³, Amy Chen³, and Baowei Fei^{1,2,3,4}

¹Emory University and Georgia Institute of Technology, Atlanta, GA,

²University of Texas at Dallas, Richardson, TX, ³Emory University,

Atlanta, GA, ⁴University of Texas Southwest Medical Center, Dallas, TX

2:30 pm–2:45 pm

Pharmacokinetic Analysis of Clinical Radiotracers in Microfluidic Incubators Using Radioluminescence Microscopy

Tae Jin Kim¹, Minkyu Kim¹, Sindy K.Y. Tang¹, and Guillem Pratx¹

¹Stanford University, Stanford, CA

2:45 pm–3:00 pm

Fused-Data Transrectal Electrical Impedance Tomography for Prostate Cancer Imaging

Ethan Murphy¹, Xiaotian Wu¹, and Ryan Halter¹

¹Dartmouth College, Hanover, NH

OP-Thurs-2-8

Room A302

Track: Tissue Engineering

Tissue Interfaces & Patterning

Chairs: Kelly Stevens, Jon Dobson

1:30 pm–1:45 pm

In Vitro Reconstitution of Intestinal Mucosal Barrier Complexity with Human Epithelium and Mucus Layer

Abhinav Sharma¹, Justinne R Guarin¹, Neil Forbes¹, and Jungwoo Lee¹

¹University of Massachusetts Amherst, Amherst, MA

1:45 pm–2:00 pm

In-Silica Extraction of Mouse Lung Vasculature Via Micro-CT For Modelling De-and Recellularization

Eric A. Chadwick¹, Benzhong Zhao¹, Takaya Suzuki², Golnaz Karoubi^{1,2}, David Romero¹, Cristina Amon¹, Thomas K. Waddell^{2,3}, and Aimy Bazylak¹

¹University of Toronto, Toronto, ON, Canada, ²University Health Network, Toronto, ON, Canada, ³Toronto General Hospital Research Institute, Toronto, ON, Canada

2:00 pm–2:15 pm

Fabrication Of Multiscale Vascular Channels in a Gelatin Hydrogel Using A Hybrid Sacrificial Approach

John Rector¹, Brian O'Grady¹, Jason Wang¹, Shannon Faley¹, and Leon Bellan¹
¹Vanderbilt University, Nashville, TN

2:15 pm–2:30 pm

Tracheal Cartilage-Derived Extracellular Matrix Methacrylamide for 3D Bioprinting

Zachary Galliger¹ and Angela Panoskaltis-Mortari¹
¹University of Minnesota, Minneapolis, MN

2:30 pm–2:45 pm

Patient-Specific Dissolvable Molds for the Fabrication of Cryogels for Regeneration of Craniofacial Bone Defects

Angela Alarcon de la Lastra¹, Katherine Hixon¹, Amanda Banks¹, Lavanya Aryan¹, Alexander Lin¹, Andrew Hall¹, and Scott Sell¹
¹Saint Louis University, St. Louis, MO

2:45 pm–3:00 pm

Micro-Wounding Platform For Robust, Precise and High-Throughput Puncture Of Soft Engineered Tissues.

Sarah Dubois¹ and Christopher Moraes¹
¹McGill University, Montreal, QC, Canada

OP-Thurs-2-9

Room A305

Tracks: Device Technologies and Biomedical Robotics

Implantable Devices I

Chairs: Keefe Manning, Daniel Cavanag

1:30 pm–1:45 pm

Development of an Optogenetics-based Bioartificial Pancreas Device

Fan Zhang¹, Hojatollah Rezaei Nejad¹, Sameer Sonkusale¹, and Emmanuel Tzanakakis^{1,2}
¹Tufts University, Medford, MA, ²Tufts Medical Center, Boston, MA

1:45 pm–2:00 pm

Evaluating Human Islet Performance for an Intravascular Bioartificial Pancreas Based on Silicon Nanopore Membranes

Ana Santandreu¹, Charles Blaha¹, Jarrett Moyer¹, Nathan Wright¹, Thomas Horn¹, and Shuvo Roy¹
¹UC San Francisco, San Francisco, CA

2:00 pm–2:15 pm

A Physically Realistic Experimental Apparatus for Evaluating Ventricular Catheter Performance

Zachary Bingham¹ and Stephanie TerMaath²
¹University of Tennessee, Knoxville, TN, ²University of Tennessee, Knoxville, TN

2:15 pm–2:30 pm

The Importance of Transient Physics and Boundary Conditions in Simulating Ventricular Catheter Performance

Stephanie TerMaath¹ and Stephen Wood²
¹University of Tennessee, Knoxville, TN, ²NASA-Langley Research Center, Hampton, VA

2:30 pm–2:45 pm

Optimal Range of Settings for Fontan Cavopulmonary Pump

Masoud Farahmand¹, Minoos Kavarana², and Ethan Kung¹
¹Clemson University, Clemson, SC, ²Medical University of South Carolina, Charleston, SC

2:45 pm–3:00 pm

A Computational Modelling for Hemodynamic Conditions Following Flow-Diverting Treatment in Cerebral Aneurysms

Alexandrina Untaroiu¹ and Gen Fu¹
¹Virginia Tech, Blacksburg, VA

OP-Thurs-2-10

Room A401

Track: Cardiovascular Engineering

Computational Modeling in the Cardiovascular System

Chairs: Juan Jimenez, Heather Hayenga

1:30 pm–1:45 pm

Effect of Coronary Flow Reserve on CFD-Derived Fractional Flow Reserve

Jackson Hair^{1,2}, David Molony¹, Lucas Timmins³, Habib Samady¹, and John Oshinski^{1,2}
¹Emory University, Atlanta, GA, ²Georgia Tech, Atlanta, GA, ³University of Utah, Salt Lake City, UT

1:45 pm–2:00 pm

Deriving FFR From Routine Angiogram-based Fluid Simulations to Discerning FFR Grey-zone

Madhurima Vardhan¹, John Gounley¹, James Chen², Andrew Kahn³, Jane Leopold⁴, and Amanda Randles¹
¹Duke University, Durham, NC, ²University of Colorado AMC, Denver, CO, ³University of California San Diego, San Diego, CA, ⁴Harvard University, Brigham and Women's Hospital, Boston, MA

2:00 pm–2:15 pm

A Murine Computational Cardiac Model of the Adaptation to Pulmonary Arterial Hypertension

Reza Avaz¹, Emilio Mendiola¹, David Li¹, Richard Dixon², and Michael Sacks³
¹UT Austin, Austin, TX, ²Texas Heart Institute, Houston, TX, ³University of Texas at Austin, Austin, TX

2:15 pm–2:30 pm

Computational Analysis of the Pathophysiological Mechanisms in Heart Failure with Preserved Ejection Fraction Patients

Sheikh Mohammad Shavik¹, Daniel Burkhoff², and Lik Chuan Lee¹
¹Michigan State University, East Lansing, MI, ²Columbia University, NY, NY

2:30 pm–2:45 pm

Comparison Of Stroke Probabilities Prediction in VADs Under Pulsatile and Steady Flow Conditions as a Function of Outflow Graft

Ray Prather¹, Alain Kassab¹, Eduardo Divo², and William Decamp³
¹University of Central Florida, Orlando, FL, ²Embry-Riddle Aeronautical University, Daytona Beach, FL, ³Orlando Health, Orlando, FL

2:45 pm–3:00 pm

Evaluating Venoarterial Extracorporeal Membrane Oxygenation using a 1D Blood Flow Simulator

Bradley Feiger¹, Ajar Kochar¹, John Gounley¹, Desiree Bonadonna¹, Mani Daneshmand¹, and Amanda Randles¹
¹Duke University, Durham, NC

OP-Thurs-2-11

Room A403

Track: Cellular and Molecular Bioengineering

Drugs and Growth Factors

Chairs: Dipanjan Pan, Simpson LaShan

1:30 pm–1:45 pm

Chitosan Acts as an Adjuvant by Enhancing Antibody Responses after a Single Dose Protein Vaccination

Anna Lampe¹, Eric Farris¹, Matthew Ballweg¹, Deborah Brown¹, and Angela Pannier¹
¹University of Nebraska- Lincoln, Lincoln, NE

1:45 pm–2:00 pm

Oxidation-Resistant Polymer-Crosslinked Galectin-1 Therapies for Treating Inflammation

Margaret M. Fettis¹ and Gregory A. Hudalla¹
¹University of Florida, Gainesville, FL

2:00 pm–2:15 pm

Engineering a Second-Generation IL-1 Receptor Antagonist for Wound Repair

Blake Lash¹, Rezvan Karami¹, and Mikael Martino¹
¹Australian Regenerative Medicine Institute, Melbourne, Australia

2:15 pm–2:30 pm

Novel Engineered Growth Factor Enhances Pro-Regenerative T Cell Mobilization and Function

Jacqueline Larouche^{1,2}, Ziad Julier², Jean Tan², Anthony Park², and Mikael Martino²
¹University of Michigan, Ann Arbor, MI, ²Australian Regenerative Medicine Institute, Monash University, Melbourne, Australia

2:30 pm–2:45 pm

Characterizing Glioblastoma Heterogeneity via Single-cell Receptor Quantification

Si (Stacie) Chen^{1,2} and Princess Imoukhuede²
¹University of Illinois at Urbana-Champaign, Urbana, IL, ²Washington University at St. Louis, St. Louis, MO

2:45 pm–3:00 pm

Sphingolipid Metabolism: A Potential Therapeutic Target in Sickle Cell Disease Associated Pathologies

Edward Botchwey¹, Jada Selma¹, Nathan Chiappa¹, Hannah Song¹, Carmen Gil¹, and Manu Platt¹
¹Georgia Institute of Technology, Atlanta, GA

OP-Thurs-2-12

Room A404

Track: Cellular and Molecular Bioengineering

Cancer Cell Motility and Migration

Chairs: Jennifer Leight, Madeleine Oudin

1:30 pm–1:45 pm

Contraction of the Cell Rear is Essential for Driving Nuclear Translocation Through Confinements

Jeremy Keys¹, Meredith Levy¹, Philipp Isermann¹, and Jan Lammerding¹
¹Cornell University, Ithaca, NY

1:45 pm–2:00 pm

Physical Confinement Alters Sarcoma Cell Cycle Progression and Division

Rebecca Moriarty¹ and Kimberly Stroka¹
¹University of Maryland-College Park, College Park, MD

2:00 pm–2:15 pm

Vimentin is Required for Lung Cancer Cell Migration and Invasion

Alexandra Berr¹, Mark Ciesielski¹, Clarissa Koch¹, Yuan Cheng¹, Jennifer Davis¹, and Karen Ridge¹
¹Northwestern University, Chicago, IL

2:15 pm–2:30 pm

Leader Cells Reorganize Within Tumor Organoids to Lead Directed Collective Migration

Priscilla Hwang¹, Audrey Brenot¹, Ashley King¹, Steven George², and Gregory Longmore¹
¹Washington University in St Louis, St Louis, MO, ²University of California, Davis, Davis, CA

2:30 pm–2:45 pm

Energetic Regulation of Coordinated Leader-Follower Dynamics During Collective Invasion of Cancer Cells

Jian Zhang¹, Francois Bordeleau¹, and Cynthia Reinhart-King^{1,2}
¹Vanderbilt University, Nashville, TN, ²Cornell University, Ithaca, NY

2:45 pm–3:00 pm

Cooperative Migration Between Invasive and Non-Invasive Cancer Subpopulations Optimizes Metastasis.

Lauren Hapach^{1,2}, Shawn P. Carey¹, Zachary E. Goldblatt¹, Wenjun Wang², and Cynthia A. Reinhart-King^{1,2}
¹Cornell University, Ithaca, NY, ²Vanderbilt University, Nashville, TN

OP-Thurs-2-13

Room A405

Track: Nano and Micro Technologie

Tissues-on-Chip for Biomedicine

Chairs: Hyowon Hugh Lee, Ashutosh Agarwal

1:30 pm–1:45 pm

Local Stimulation of Immune Responses with Hybrid Lymph Node Tissue-Chips

Rebecca Pompano¹, Ashley Ross², and Megan Catterton¹
¹University of Virginia, Charlottesville, VA, ²University of Cincinnati, Cincinnati, OH

1:45 pm–2:00 pm

Integrated Nanoplasmonic Obesity-on-Chip Biosensing Platform for Investigating Adipose Tissue Inflammation

Jingyi Zhu¹, Michael Verano², Jose Aleman², and Weiqiang Chen¹
¹New York University, Brooklyn, NY, ²New York University, New York, NY

2:00 pm–2:15 pm

An ECM-Based Droplet Platform For Studying Long-Term Tissue Remodeling

Katherine Cummins¹, Alexandra Crampton¹, and David Wood¹
¹University of Minnesota, Minneapolis, MN

2:15 pm–2:30 pm

Fabrication Of 3D Human Liver Microtissues Using Droplet-Based Microfluidics

David Kukla¹, Alexandra Crampton², David Wood², and Salman Khetani¹
¹University of Illinois at Chicago, Chicago, IL, ²University of Minnesota, Minneapolis, MN

2:30 pm–2:45 pm

Mammary Gland-Thick Tissue Bioreactor: A Platform for Studying Effects of Complex Microenvironments

Dmitry Markov¹, Gloria Bazilevich¹, Phillip Fryman¹, Katarzyna Rejniak², and Lisa McCawley¹
¹Vanderbilt University, Nashville, TN, ²H. Lee Moffitt Cancer Center & Research Institute, Tampa, FL

2:45 pm–3:00 pm

Microfluidic Printing Enabled Drug-on-Pillar Platform for Personalized Drug Screening

Jiannan Li¹, Wenwu Xiao¹, Yongfan Men¹, Wen Tan^{1,2}, Kit S. Lam¹, and Tingrui Pan¹
¹University of California, Davis, Davis, CA, ²Lanzhou University, Lanzhou, China, People's Republic of

OP-Thurs-2-14

Room A406

Track: Drug Delivery & Intelligent Systems

Topics in Drug Delivery

Chairs: Lance Kam, Forrest Kievit

1:30 pm–2:00 pm

Nanostructure-Enhanced Transepithelial Drug Delivery

Tejal A. Desai¹
¹University of California San Francisco, San Francisco, CA



2:00 pm–2:15 pm

Resveratrol Scaffolds Implanted Into Fat Protect Mice From Glucose Intolerance Caused By a High Fat Diet

Michael Hendley¹, Prakasam Annamalai¹, and Michael Gower¹
¹University of South Carolina, Columbia, SC

2:15 pm–2:30 pm

Nanoparticle-coated Floss For Treatment of Periodontitis

Seth Boese¹ and Harvinder Gill¹
¹Texas Tech University, Lubbock, TX

2:30 pm–2:45 pm

Megakaryocyte Membrane-Wrapped Nanoparticles to Target Hematopoietic Stem Cells

Jenna Harris¹, Erica Winter¹, E. Terry Papoutsakis¹, and Emily Day¹
¹University of Delaware, Newark, DE

2:45 pm–3:00 pm

A Stand-Alone Implantable Refillable Scalable Microreservoir For Drug Delivery In Small Animals

Farzad Forouzandeh¹ and David Borkholder¹
¹Rochester Institute of Technology, Rochester, NY

OP-Thurs-2-15

Room A407

Track: Bioinformatics, Computational and Systems Biology, Cellular and Molecular Bioengineering

Single-cell Measurements and Models

Chairs: Kathryn Miller-Jensen, Patrick Cahan

1:30 pm–1:45 pm

Single-Cell Distributions of Growth Factor Stimulation through Quantum Dot-Calibrated 3D Deconvolution Microscopy (QDC-3DM)

Phuong Le¹, Sung Jun Lim¹, Brian Baculis¹, Hee Jung Chung¹, Kristopher Kilian², and Andrew Smith¹
¹University of Illinois at Urbana-Champaign, URBANA, IL, ²University of New South Wales, Sydney, Australia

1:45 pm–2:00 pm

Identifying Cell-Cell Communication in the Tumor Microenvironment using Single-Cell RNA-Sequencing

Manu Kumar¹, Jinyan Du², Douglas Lauffenburger¹, and Andreas Raue²
¹Massachusetts Institute of Technology, Cambridge, MA, ²Merrimack Pharmaceuticals, Cambridge, MA

2:00 pm–2:15 pm

Heterogeneous Regulation and Misregulation of NRF2 in Single Triple-Negative Breast Cancer Cells

Elizabeth Pereira¹, Joseph Burns¹, Christina Lee¹, and Kevin Janes¹
¹University of Virginia, Charlottesville, VA

2:15 pm–2:30 pm

Mitochondrial-Mediated Oxidative CamKII Activation Induces Early Afterdepolarizations in Guinea Pig Cardiomyocytes: An *In Silico* Study

Patrick Ernst¹, Ruilin Yang^{1,2}, Jiajia Song¹, Xiaoguang M Liu¹, Sabine Huke¹, Shuxin Wang², Jianyi Jay Zhang¹, and Lufang Zhou¹
¹University of Alabama at Birmingham, Birmingham, AL, ²Key Laboratory for Mechanism Theory and Equipment Design of Ministry of Education, Tianjin University, Tianjin, China, People's Republic of

2:30 pm–2:45 pm

Three-Dimensional Subcellular Profiling in Single Cells by Multiplex Ion Beam Nanoscopy

Ahmet Coskun¹ and Garry Nolan¹
¹Stanford University School of Medicine, Stanford, CA

2:45 pm–3:00 pm

Heritable Rare Cell Variability in Cancer Therapy Resistance

Sydney Shaffer¹, Benjamin Emert¹, Rohit Gupta¹, and Arjun Raj¹
¹University of Pennsylvania, Philadelphia, PA

OP-Thurs-2-16

Room A303

Track: Neural Engineering

Neural Disease: Model Systems and Therapeutics

Chairs: Daniel Gallego-Perez, Matt Wood

1:30 pm–1:45 pm

Interstitial Flow Stimulates Glial Cells to Promote Glioma Invasion: Implications for Glioma Therapy

R. Chase Cornelison¹, Jessica Yuan², Kathryn Kingsmore², Caroline Brennan², and Jennifer Munson^{1,2}
¹Virginia Tech, Blacksburg, VA, ²University of Virginia, Charlottesville, VA

1:45 pm–2:00 pm

αβ42 Acts Through the Beta-2 Adrenergic Receptor to Dysregulate the L-type Calcium Channel 1.2

Jennifer Price¹, Boram Lee¹, Liangying Li¹, and Johannes Hell¹
¹University of California–Davis, Davis, CA

2:00 pm–2:15 pm

Antioxidant Nanoparticles for Inhibition of α-Synuclein Fibrillization and Intracellular Aggregation in Microglia

Nanxia Zhao¹, Rebecca Chmielowski¹, Xue Yang¹, Hannah Calvelli¹, Nicola Francis¹, Alysha Moretti¹, Yue Cao², Zhiping Pang³, Kathryn Uhrich², Jean Baum¹, and Prabhas Moghe¹
¹Rutgers University, Piscataway, NJ, ²University of California, Riverside, Riverside, CA, ³Child Health Institute of New Jersey, Rutgers University, New Brunswick, NJ

2:15 pm–2:30 pm

Spontaneous Neural Activity Propagates in the Brain by Ephaptic Coupling

Rajat Shivacharan¹, Chia-Chu Chiang¹, and Dominique Durand¹
¹Case Western Reserve University, Cleveland, OH

2:30 pm–2:45 pm

In Vitro Characterization of Blood Brain Barrier Permeability Post Microcavitation

Edidiong Inyang¹, Bo Chen¹, Vinay Abhyankar², and Michael Cho¹
¹University of Texas at Arlington, Arlington, TX, ²Rochester Institute of Technology, Rochester, NY

2:45 pm–3:00 pm

In Vivo Calcium Imaging Of Awake, Unconstrained Mice Reveals Blast Induced Traumatic Brain Injury Causes Delayed Changes In Functional Connectivity Within Hippocampal CA1 Neurons

Matthew Hemphill¹, Shanti Tummala¹, and David Meaney¹
¹University of Pennsylvania, Philadelphia, PA

OP-Thurs-2-17

Room A304

Track: Orthopedic and Rehabilitation Engineering, Tissue Engineering

Musculoskeletal Tissue Engineering I

Chairs: Jingwei Xie, Rebecca Wachs

1:30 pm–1:45 pm

Rotator Cuff Repair Augmentation Via an Engineered Growth Factor Delivery Scaffold

Varadraj Vernekar¹, Anupama Prabhat¹, Mary Badon¹, Jean-Emmanuel Avochinou¹, and Cato Laurencin¹
¹UConn Health, Farmington, CT

1:45 pm–2:00 pm

Endothelin-1 Inhibits Clearance of Nanoparticles from Rat Knees

Fabrice Bernard¹, Thanh Doan², Jay McKinney², J. Brandon Dixon^{1,3,4}, and Nick Willett^{1,2,4,5}
¹Georgia Institute of Technology and Emory University, Atlanta, GA, ²Emory University, Atlanta, GA, ³Georgia Institute of Technology, Atlanta, GA, ⁴Parker H. Petit Institute for Bioengineering and Bioscience, Atlanta, GA, ⁵Atlanta Veteran's Affairs Medical Center, Decatur, GA

2:00 pm–2:15 pm

Early Weight Bearing Improves Cartilage Repair in an Engineered In Vitro Model of Microfracture

Tomoya Iseki¹, Hiroshi Sasaki¹, Shinsuke Kihara¹, Shinichi Yoshiya², Freddie Fu¹, Rocky Tuan¹, and Riccardo Gottardi^{1,3}
¹University of Pittsburgh, Pittsburgh, PA, ²Hyogo College of Medicine, Nishinomiya city, Japan, ³Ri.MED Foundation, Palermo, Italy

2:15 pm–2:30 pm

SB-431542 Encapsulated Microspheres as a Strategy to Prevent Arthrofibrosis

Jaehan Lee¹, William T. Yu¹, Robert M. Stefani¹, Christopher M. Mahoney², Kacey G. Marra², Gerard A. Ateshian¹, Roshan P. Shah³, and Clark T. Hung¹
¹Columbia University, New York, NY, ²University of Pittsburgh, Pittsburgh, PA, ³New York Presbyterian Hospital, New York, NY

2:30 pm–2:45 pm

Engineered Cartilage from Genome-Edited Chondrocytes for the Study and Treatment of Osteoarthritis

Matthew Rich¹, Susan D'Costa², Noah Pieper¹, and Brian Diekman^{1,2}
¹UNC-Chapel Hill/NC State, Chapel Hill, NC, ²University of North Carolina School of Medicine, Chapel Hill, NC

2:45 pm–3:00 pm

PLGA-Based Microribbons that Support Homogeneous Cell Encapsulation in 3D Macroporous Scaffolds with Enhanced Mechanical Properties for Bone Tissue Engineering

Danial Barati¹, Fan Yang¹, Kira Watkins¹, and Zhibin Wang¹
¹Stanford University, Stanford, CA

OP-Thurs-2-18

Room A408

Track: Stem Cell Engineering

Advanced Biomanufacturing and Translation of Stem Cell Therapies

Chairs: Jeffery Milman, Kristopher Killian

1:30 pm–1:45 pm

Sustained Release from Nanostructured Microparticles Reduces the Dosage of Basic Fibroblast Growth Factor Required for Long-Term Human Pluripotent Stem Cell Expansion

Angela Xie¹, Hunter Johnson¹, Andrew Khalil¹, and William Murphy¹
¹University of Wisconsin-Madison, Madison, WI

1:45 pm–2:00 pm

Engineering Biomaterial Microenvironments to Facilitate Long-Term, Clinical-Scale Skeletal Muscle Stem Cell Expansion

Kun Ho Kim¹, Alexander Loiben¹, and Benjamin Cosgrove¹
¹Cornell University, Ithaca, NY

2:00 pm–2:15 pm

Advanced Biomanufacturing of Human CNS Tissue Slices

Alireza Aghayee¹, Gavin Knight¹, and Randolph Ashton¹
¹UW-Madison, Madison, WI

2:15 pm–2:30 pm

Enabling Mesenchymal Stem Cell Potency Analysis Using Tissue-on-a-Chip Platforms

Evelyn Williams^{1,2,3}, José García^{3,4}, Robert Mannino^{1,2,3}, Andrés García^{3,4}, and Wilbur Lam^{1,2,3}
¹The Wallace H. Coulter Department of Biomedical Engineering, Georgia Institute of Technology and Emory University, Atlanta, GA, ²A?ac Cancer and Blood Disorders Center of Children's Healthcare of Atlanta, Emory University School of Medicine, Atlanta, GA, ³Parker H. Petit Institute of Bioengineering and Bioscience Georgia Institute of Technology, Atlanta, GA, ⁴Woodruff School of Mechanical Engineering, Georgia Institute of Technology, Atlanta, GA

2:30 pm–2:45 pm

Stem Cell Engineering of Insulin-Producing Beta Cells from Diabetic Patients for Therapy

Kristina Maxwell¹ and Jeffrey Millman¹
¹Departments of Medicine and Biomedical Engineering, Washington University School of Medicine, St. Louis, MO

2:45 pm–3:00 pm

Perfusion Bioreactor System for Enhanced Therapeutic Extracellular Vesicle Production

Divya Patel¹, Yasasvini Santharam¹, Christopher Luthers¹, Max Lerman¹, John Fisher¹, and Steven Jay¹
¹University of Maryland, College Park, College Park, MD

OP-Thurs-2-19

Room A409

Track: Respiratory Bioengineering

Respiratory Modeling & Mechanobiology

Chairs: Samir Ghadiali, Elizabeth Bartolak-Suki

1:30 pm–1:45 pm

Could Changes in Tidal Volume Explain Why Exercise-Induced Bronchoconstriction (EIB) Occurs Post-Exercise and Not in Direct Response to the Stimulus?

Tilo Winkler¹
¹Massachusetts General Hospital, and Harvard Medical School, Boston, MA

1:45 pm–2:00 pm

Retrograde Flow During Pulsatile Reopening Improves Reopening Uniformity in Albumin Infiltrated Obstructed Airway Bifurcations.

Eiichiro Yamaguchi¹, Philippe Gendreau², and Donald Gaver¹
¹Tulane University, New Orleans, LA, ²Mines Paris Tech, Paris, France

2:00 pm–2:15 pm

Meso-Scale Parenchymal Mechanics in 3D Multi-Scale Lung Model

Donald Gaver¹, Jason Ryans¹, and Hideki Fujioka¹
¹Tulane University, New Orleans, LA

2:15 pm–2:30 pm

A Micropattern-Engraved Two-Compartment Tissue-Chip as a Model for Studying Right Ventricular Hypertrophy Induced by Pulmonary Arterial Hypertension

Ali Keshavarz¹, Taslim Al-Hilal¹, Wei Li², and Fakhru Ahsan¹
¹Texas Tech University Health Sciences Center, Amarillo, TX, ²Texas Tech University, Lubbock, TX

2:30 pm–2:45 pm

Distribution of Stretch amplitudes Regulate Mitochondrial Structure and ATP Production in Human Airway Smooth Muscle Cells

Elizabeth Bartolak-Suki¹, Samer Bou Jawde¹, Yoseph Dance¹, Ramaswamy Krishnan², and Bela Suki¹
¹Boston University, Boston, MA, ²Harvard University, Boston, MA

2:45 pm–3:00 pm

Stiffness Controlled Extracellular Matrix Substrates for Mimicking the Lung Microenvironment

Robert Pouliot¹, Aniruddha Bhattacharyya¹, Heon Park¹, Alison Kahn^{1,2}, Nathan Gasek¹, Juan Jose Uriarte¹, Franziska Uhl¹, and Daniel Weiss¹
¹University of Vermont, Burlington, VT, ²Rochester Institute of Technology, Rochester, NY

OP-Thurs-2-20

Sidney Marcus
Auditorium

Track: Biomedical Engineering
Education (BME)

Innovation in Design

Chairs: Amir Manbachi, James A. Keszenheimer

1:30 pm–1:45 pm
Mini-Design Projects are Effective Means to Fill Gaps in Student Training

Mark Ruegsegger¹
¹The Ohio State University, Columbus, OH

1:45 pm–2:00 pm
Clinical Needs Finding—A Novel Course Promoting Engineering Design, Community Engagement, and Healthcare Innovations

Hanna Jensen¹ and Raj Rao¹
¹University of Arkansas, Fayetteville, AR

2:00 pm–2:15 pm
Virtual Reality as a Tool for Biomedical Engineers to Identify Unmet Clinical Needs: A Pilot Study in the Use of VR for Clinical Observation

Katherine Blevins¹, Lyn Denend¹, Richard Fan¹, Shiqin Xu¹, William Kethman¹, Justin Huelman¹, Ross Venook¹, and James Wall¹
¹Stanford University, Stanford, CA

2:15 pm–2:30 pm
Clinical Exposure Improves Team-based Design Outcomes vs. Traditional Capstone Projects

Adam Engler¹
¹UC San Diego, La Jolla, CA

2:30 pm–2:45 pm
Synergistic Redesign of a Computer-Aided Design Laboratory for Enhanced Senior Capstone Experience

Bilal Ghosn¹ and Eric Richardson^{1,2}
¹Rice University, Houston, TX, ²Duke University, Durham, NC

2:45 pm–3:00 pm
Incorporating Industry Visits in a Faculty-Led Summer Study Abroad Program

Paul Benkeser¹
¹Georgia Institute of Technology, Atlanta, GA

NIH FUNDING PANEL SESSION

1:30 pm–3:00 pm

Room A301

Chairs: Zeynep Erim, Tony Dickherber

The session will provide an overview of NIH funding opportunities and resources particularly well-suited to the BME research community. NIH Program Officers and awardees will offer insights and “lessons learned” from the perspective of winning these NIH awards as well as in serving on NIH review panels. The session will explore how researchers may develop strategies to align their research interests with NIH opportunities and priorities. The session is supported by funding through the National Institutes of Health NIBIB, NCI, Nlams, NICHD and NINDS.

SPECIAL SESSION

1:30 pm–3:00 pm

Room A310

Soft Material-Enabled Electronics for Medicine, Healthcare, and Human-Machine Interfaces

Chairs: Woon-Hong Yeo, Jae-Woong Jeong

The session will feature renowned speakers who made significant advancements in low-profile, stretchable wearable and implantable electronics for disease diagnostics, health monitoring, therapeutics, and machine interfaces. Introduction and discussion of the emerging technologies and systems regarding wearable and implantable biosensors and bioelectronics will make a direct contribution to the biomedical engineering society since this emerging research area is focusing on the development of advanced materials and engineering technologies to advance human health and well-being.

SPECIAL SESSION

2:30 pm–5:00 pm

Room A411

6th US-Korea Joint BMES Workshop on Biomedical Engineering

Chairs: Ho-Wook Jun, Hanjoong Jo

The goal of the 6th Annual US-Korea Joint Workshop on Biomedical Engineering is to promote cooperation, collaboration, and networking between the members of Korean Society of Medical and Biological Engineering (KOSOMBE) and Biomedical Engineering Society (BMES). In the past five years, this annual Workshop has become increasingly well-known among biomedical engineers in both US and Korea, attracting >~100 Pls and trainees from both countries as part of the Annual BMES meeting. The workshop will cover topics on various convergent technologies to better understand and improve human health via different approaches in multi-disciplines including biomaterials, tissue engineering, mechanobiology, biotransport, neuro-engineering, exosome, and immunotherapies, drug delivery, medical imaging, immune cancer therapy, stem cell therapy, and bionanotechnology. The Workshop provides an important venue and serves as bridge for a long-term relationship and mutual benefit for both Society members in US and Korea.

OP-Thurs-3-1

Room A311

Track: Biomaterials

New Hydrogel Methods

Chairs: Jason Burdick, Omid Veisoh

3:45 pm–4:00 pm

Tailoring Gelation and Mechanical Properties of Fibrin-Based Extracellular Matrix Using Stimulus-Responsive Poly (Lactic-co-Glycolic Acid) Microgelator

Yu-Tong Hong¹ and Hyunjoon Kong¹

¹University of Illinois Urbana Champaign, Urbana, IL

4:00 pm–4:15 pm

Covalent Interactions of Mesenchymal Stem Cells with Gellan Hydrogels

Alessia Battigelli¹, Bethany Almeida¹, and Anita Shukla¹

¹Brown University, Providence, RI

4:15 pm–4:30 pm

Dynamic and Injectable Hydrogels Through Reaction of Gallol-modified ECM Components

Mikyung Shin^{1,2}, Jonathan Galarraga¹, and Jason Burdick¹

¹University of Pennsylvania, Philadelphia, PA, ²Korea Advanced Institute of Science and Technology, DAEJEON, Korea, Republic of

4:30 pm–4:45 pm

Programmable Modulation of Cellular Viability Using Self-Assembled Peptide Nanofibers

Zain Siddiqui¹, Michael McGowan¹, Peter Nguyen¹,

Patricia Iglesias-Montoro¹, Biplab Sarkar¹, and Vivek Kumar¹

¹New Jersey Institute of Technology, Newark, NJ

4:45 pm–5:00 pm

Biochemical Modification of PEG Hydrogels Using SpyCatcher, a Genetically-Encoded Click Reaction

Joshua Hammer¹, Anna Ruta¹, and Jennifer West¹

¹Duke University, Durham, NC

5:00 pm–5:15 pm

Impedimetric Measurement Of Acidosis With a pH-Responsive Hydrogel Sensor

Ankita Bhat^{1,2} and Anthony Guiseppi-Elie^{1,2,3}

¹Center for Bioelectronics, Biosensors and Biochips (C³B), Department of Biomedical Engineering, Texas A&M University, College Station, TX, ²Department of Biomedical Engineering, Texas A&M University, College Station, TX, ³ABTECH Scientific, Inc., Biotechnology Research Park, 800 East Leigh Street, Richmond, VA

OP-Thurs-3-2

Room A312

Track: Biomaterials

Biomaterials in Regenerative Medicine

Chairs: Leon Bellan, Jay Sy

3:45 pm–4:00 pm

Structural Optimization and *In Vivo* Testing of ROS Scavenging Polymers

Bryan Dollinger¹, Taylor Kavanaugh¹, Eric Dailing¹, Justin Mollison¹, and Craig Duvall¹

¹Vanderbilt University, Nashville, TN

4:00 pm–4:15 pm

Injectable Guest-Host Hydrogel/Microgel Composites for Sustained Delivery of IL-10 after Myocardial Infarction

Minna Chen¹, Jennifer Chung¹, Joshua Mealy¹, Elizabeth Li¹,

Maria Arisi¹, Samir Zaman¹, Pavan Atluri¹, and Jason Burdick¹

¹University of Pennsylvania, Philadelphia, PA

4:15 pm–4:30 pm

Preventing Hypoxia-induced Beta Cell Death and Dysfunction via Oxygen-generating Microbeads

Jiapu Liang¹, Maria Coronel¹, Minh Dang¹, and Cherie Stabler¹

¹University of Florida, Gainesville, FL

4:30 pm–4:45 pm

Improved Neuromuscular Junction-in-a-Dish Function Using Mechanically Patterned Substrates

Cassandra Happe¹, Kevin Tenerelli¹, Anastasia Gromova¹,

Frederic Kolb², and Adam Engler^{1,3}

¹UC San Diego, La Jolla, CA, ²Gustave Roussy, Paris, France, ³Sanford Consortium for Regenerative Medicine, La Jolla, CA

4:45 pm–5:00 pm

Skeletal Muscle Regeneration Enhanced by Natural Immunomodulatory Scaffolds

David Maestas, Jr.¹, Liam Chung¹, Sven Sommerfeld¹, Drew Pardoll¹, and Jennifer Elisseeff¹

¹Johns Hopkins University, Baltimore, MD

OP-Thurs-3-3

Room A410

Track: Cancer Technologies

Cancer Immunoengineering

Chairs: Erik Dreaden, Ankur Singh

3:45 pm–4:00 pm

Targeting Cytokine Immunotherapies to the Tumor Microenvironment to Improve Safety and Efficacy

John-Michael Williford¹, Jun Ishihara¹, Ako Ishihara¹, Koichi Sasaki¹, Laura Gray¹, and Jeffrey Hubbell¹

¹University of Chicago, Chicago, IL

4:00 pm–4:15 pm

A Universal Booster Vaccine for CAR-T Cells

Leyuan Ma¹ and Darrell Irvine¹

¹MIT, HHMI, Cambridge, MA

4:15 pm–4:30 pm

Functionalized Microcarriers for CAR T Cell Manufacturing

Nate Dwarshuis¹, Hannah W. Song¹, Anokhi Patel¹, and Krishnendu Roy¹
¹Georgia Institute of Technology and Emory School of Medicine, Atlanta, GA

4:30 pm–4:45 pm

Lymphatics-like Microdevices to Study the Role of Lymphoid Microenvironment on B Cell Receptor Signaling in Chemoresistant Human B Cell Lymphomas

FNU Apoorva¹, Alexander Loiben¹, Shivem Shah¹, Lorena Fontan², Brian Kirby¹, Ari Melnick², Benjamin Cosgrove¹, and Ankur Singh¹
¹Cornell University, Ithaca, NY, ²Weill Cornell Medical College, New York, NY



4:45 pm–5:00 pm

Nanoparticle-Enabled Delivery of Cyclic Dinucleotides Induces Immunogenic Cell Death and Anti-Tumor Immunity in Neuroblastoma

Lihong Wang Bishop¹, Daniel Shae¹, Kyle W Becker¹, Max E Jacobson¹, and John T Wilson¹
¹Vanderbilt University Nashville, TN

5:00 pm–5:15 pm

The Impact of CD47 on Tumor-specific Immune Response to Melanoma and Strategies for Combination Immunotherapy

Subhadra Jayaraman¹, Huanjing Bi¹, Anita Venkitaraman¹, Busra Buyuk¹, Carolyn Ma¹, Alana Macdonald¹, Puloma Sen¹, Sha Jin¹, and Kaiming Ye¹
¹Binghamton University, Binghamton, NY

OP-Thurs-3-4

Room A313

Track: Biomechanics, Biomaterials

Biomechanics of Biomaterials

Chairs: Stephanie Fraley, Ian Wong

3:45 pm–4:00 pm

Creep Strain During Tendon Fatigue Loading Increases with Accumulation of Collagen Molecular Damage

Jared Zitnay¹, Yang Li¹, Allen Lin¹, S. Michael Yu¹, and Jeffrey Weiss¹
¹University of Utah, Salt Lake City, UT

4:00 pm–4:15 pm

Orientation Dependencies of Vaginal Tissue and Tears

Jeffrey McGuire¹, Steve Abramowitch², Spandan Maiti², and Raffaella De Vita¹
¹Virginia Tech, Blacksburg, VA, ²University of Pittsburgh, Pittsburgh, PA

4:15 pm–4:30 pm

Mechanics of Ligaments: Material vs. Structural Properties and the Role of Geometry in Mechanical Measurements

Callan Luetkemeyer¹, Ryan Rosario¹, and Ellen Arruda¹
¹University of Michigan, Ann Arbor, MI

4:30 pm–4:45 pm

Microcrack Initiation and Propagation in Articular Cartilage

Stephany Santos¹, Nancy Emery², Corey P. Neu², and David M. Pierce¹
¹University of Connecticut, Storrs, CT, ²University of Colorado, Boulder, CO

4:45 pm–5:00 pm

An Optical Approach to Monitor Membrane Dynamics in Response to Tension

Margrethe Boyd¹ and Neha Kamat¹
¹Northwestern University, Evanston, IL

5:00 pm–5:15 pm

Mechanical Activation of Piezo1 Ion Channel by Laser-induced Cavitation Bubble and Surface Acoustic Wave

Defei Liao¹, Fenfang Li¹, Ricky Park¹, Jorg Grandl¹, and Pei Zhong¹
¹Duke University, Durham, NC

OP-Thurs-3-5

Room A314

Track: Biomechanics Cardiovascular Engineering

Cardiovascular Biomechanics

Chairs: Rafaella Devita, Michelle LaPlaca

3:45 pm–4:00 pm

Lymphatic Endothelial Cell Attachment to PDMS for Studies with Fluid Shear Stress and Dynamic Stretching

Caleb Davis¹, Ashley Carney¹, Halit Onur Erdemir¹, David Zawieja², and Michael Moreno¹
¹Texas A&M University, College Station, TX, ²Texas A&M Health Science Center, Temple, TX

4:00 pm–4:15 pm

Mechanical Characterization of Tricuspid Bicuspidization in a Porcine Model

Fatiesa Sulejmani¹, Joshua Pataky¹, and Wei Sun¹
¹Georgia Institute of Technology, Atlanta, GA

4:15 pm–4:30 pm

Computational Model of Left Ventricular Remodeling Following Release of Pressure Overload

Kyoko Yoshida¹, Colleen Witzenburg¹, Andrew McCulloch², Jeffrey Omens², and Jeffrey Holmes¹
¹University of Virginia, Charlottesville, VA, ²University of California, San Diego, La Jolla, CA

4:30 pm–4:45 pm

Effects of Partial Loss of Talin1 in Cardiac Fibroblasts on Cardiac Hypertrophy

Natalie Noll¹, Qinkun Zhang¹, Hind Lal¹, Cynthia Clark¹, and W. David Merryman¹
¹Vanderbilt University, Nashville, TN

4:45 pm–5:00 pm

Harnessing Light Receptors in Vasculature to Induce Pulmonary Vasorelaxation

Sebastian Barreto Ortiz¹, Daijiro Hori¹, Yohei Nomura¹, Xin Yun¹, Haiyang Jiang¹, Hwanmee Yong¹, James Chen¹, Steven An¹, Larissa Shimoda¹, Lakshmi Santhanam¹, and Dan Berkowitz¹
¹Johns Hopkins University, Baltimore, MD

5:00 pm–5:15 pm

Biaxial Strength of Ascending Thoracic Aortic Tissue Subjected to Physiologic Loading Conditions

Spandan Maiti¹, James Thunes¹, Thomas Gleason², and David Vorp¹
¹University of Pittsburgh, Pittsburgh, PA, ²University of Pittsburgh School of Medicine, Pittsburgh, PA

OP-Thurs-3-6

Room A315

Track: Biomechanics, Cellular and Molecular Bioengineering

Matrix Effects in Mechanobiology I

Chairs: Ashley Brown, Michael Mak

3:45 pm–4:15 pm

Cell-Matrix Interactions in Fibrosis and Cancer: Multiscale Mechano-Chemical Models

INVITED

Vivek Shenoy¹

¹University of Pennsylvania, Philadelphia, PA

4:15 pm–4:30 pm

An Investigation of the Mechanobiology of Collagen VII During Wound Healing

John Selby¹, Pratibha Singh¹, Waddah Moghram¹, Mei Chen², and David Woodley²

¹University of Iowa, Iowa City, IA, ²University of Southern California, Los Angeles, CA

4:30 pm–4:45 pm

Aldehyde-Functionalized Hydrogel Substrates with Collagen Coating of Tunable Fiber Length Facilitate Collective Cell Streaming

Bapi Sarker¹, Amrit Bagchi¹, Christopher Walter¹, and Amit Pathak¹
¹Washington University, St. Louis, MO

4:45 pm–5:00 pm

Reciprocal ECM-Cell Interactions: Mechanical Regulation of Biglycan Expression in the Endothelium

Paul V. Taufalele¹, Matthew R. Zanutelli^{1,2}, Francois Bordeleau¹, Brooke Mason², Ada Gjyzezi³, Paraskevi Giannakakou³, Duane Hassane³, and Cynthia A. Reinhart-King¹

¹Vanderbilt University, Nashville, TN, ²Cornell University, Ithaca, NY, ³Weill Cornell Medical College, New York, NY

5:00 pm–5:15 pm

Linking the Mechanosensing Ability of Cells to Their Force-Generating Capabilities

Rufeng Ma¹ and Kristen Mills¹

¹Rensselaer Polytechnic Institute, Troy, NY

OP-Thurs-3-7

Room A316

Track: Biomedical Imaging and Instrumentation, Cardiovascular Engineering

Cardiovascular/Flow Imaging

Chairs: Jana Kainerstorfer, James Henderson

3:45 pm–4:00 pm

High Frequency 4D Cardiac Ultrasound in a Murine Model of Hypertrophic Cardiomyopathy

INVITED

Craig Goergen¹

¹Purdue University, West Lafayette, IN

4:00 pm–4:15 pm

Using Convolutional Neural Networks to Identify Patients at Risk for Cardiovascular Disease Using 3D Patches

James Dormer¹, Carolyn Reilly², Eduard Schreiber², and Baowei Fei^{1,2,3}

¹University of Texas at Dallas, Richardson, TX, ²Emory University, Atlanta, GA, ³University of Texas Southwest Medical Center, Dallas, TX

4:15 pm–4:30 pm

A Multimodal Noninvasive Imaging Strategy to Quantitatively Assess Functional Recovery in Preclinical Model of Peripheral Arterial Disease

Jamila Hedhli¹, MinWoo Kim², Hailey Knox³, Than Huynh³, Iwona Dobrucki², Jefferson Chan³, Albert Sinusas⁴, Michael Insana², and Lawrence Dobrucki²

¹University of Illinois Urbana-Champaign, Urbana, IL, ²University of Illinois Urbana-Champaign, Champaign, IL, ³University of Illinois Urbana-Champaign, Champaign, IL, ⁴Yale University, New Haven, CT

4:30 pm–4:45 pm

aFlow: A Novel Technique for Imaging Cerebrovascular Motions

John Martinez¹, Javid Abderezaei¹, Samantha Holdsworth², Kambiz Nael³, and Mehmet Kurt^{1,3}

¹Stevens Institute of Technology, Hoboken, NJ, ²University of Auckland, Auckland, New Zealand, ³Mount Sinai Icahn School of Medicine, New York City, NY

4:45 pm–5:15 pm

The Role of Aortic Blood Flow Patterns in AAA Localization and Initiation

INVITED

W. Robert Taylor¹

¹Emory University, Atlanta, GA

OP-Thurs-3-8

Room A302

**Track: Tissue Engineering,
Neural Engineering**

**Neural, Vascular and Immuno
Tissue Engineering**

Chairs: Ryan Gilbert, Ngan Huang

3:45 pm–4:00 pm

**3D Tissue System to Evaluate the Formation
and Repair of Neural Networks**

Jonathan Grasman¹ and David Kaplan¹
¹Tufts University, Medford, MA

4:00 pm–4:15 pm

**Harnessing Neurovascular Interaction to
Guide Axon Growth**

Paul Partyka¹ and Peter Galie¹
¹Rowan University, Glassboro, NJ

4:15 pm–4:30 pm

**Permissive Electroconductive Nanocomposites
for Neuronal Cells**

Sara Abasi^{1,2}, John R Aggas^{1,2}, and Anthony Guiseppi-Elie^{1,3,4}
¹Texas A&M University, College Station, TX, ²Center for Bioelectronics, Biosensors, and Biochips (C³B), College Station, TX, ³Center for Bioelectronics, Biosensors, and Biochips (CB³), College Station, TX, ⁴ABTECH Scientific, Inc., Biotechnology Research Park, Richmond, VA

4:30 pm–4:45 pm

**Immuno-Regulatory Roles of Cyclic Loading
That Promotes Skeletal Muscle Regeneration**

Bo Ri Seo^{1,2}, Christopher Payne^{1,2}, Stephanie McNamara^{1,2}, Brian Kwee^{1,2}, Conor Walsh^{1,2}, and David Mooney^{1,2}
¹Harvard University, Cambridge, MA, ²Wyss Institute for Biologically Inspired Engineering, Cambridge, MA

4:45 pm–5:00 pm

**Evaluation of Wound Healing and Functional
Recovery Following Tissue Engineered Muscle
Repair Treatment for Volumetric Muscle Loss**

Ellen Mintz¹, Victoria Toscano¹, Emma Afferton¹, Poonam Sharma¹, Juliana Passipieri¹, and George J. Christ¹
¹University of Virginia, Charlottesville, VA

5:00 pm–5:15 pm

**Harnessing Cell Mechanotransduction to Improve
Complex Wound Healing: A Novel Tissue
Engineered Dermal Substitute**

Karel-Bart Celie¹, Yoshiko Toyoda², Xue Dong³, Justin Buro², Alexandra Lin¹, Tara Pilato², Ryan Bender⁴, and Jason Spector²
¹Columbia University Vagelos College of Physicians and Surgeons, New York, NY, ²Weill Cornell Medicine, New York, NY, ³Xiangya Hospital, Changsha, China, ⁴SUNY Downstate Medical Center, New York, NY

OP-Thurs-3-9

Room A305

**Track: Device Technologies and
Biomedical Robotics**

Implantable Devices II

Chairs: Evon Ereifej, Shuvo Roy

3:45 pm–4:00 pm

**All-Silicon Carbide Neural Interface:
A Potential MRI Compatible Implantable Device**

Mohammad Beygi¹, Gokhan Mumcu¹, and Stephen Sadow¹
¹University of South Florida, Tampa, FL

4:00 pm–4:15 pm

**Implantable Intracranial Wireless
Fluorescence Monitor**

Alden Shoup¹, Jodi Finlay¹, Jasim Naeem¹, Justas Jakubonis¹, Sebastian Pernal¹, Alexander Willis¹, and Herbert Engelhard¹
¹University of Illinois at Chicago, Chicago, IL

4:15 pm–4:30 pm

**A Novel Customizable Stent Graft that
Contains Superelastic Nitinol and
Highly-Stretchable ePTFE**

Yanfei Chen¹, Bryan Tillman^{2,3}, Catherine Go², Moataz Elsisy¹, and Youngjae Chun^{1,3}
¹University of Pittsburgh, Pittsburgh, PA, ²University of Pittsburgh Medical Center, Pittsburgh, PA, ³McGowan Institute for Regenerative Medicine, Pittsburgh, PA

4:30 pm–4:45 pm

**A Passively Powered, Magnetoelastic Bone
Fixation Device for Providing Localized
Mechanical Stimulus at a Bone Fracture Site**

Salil Karipott¹, Bradley Nelson¹, Robert Guldberg², and Keat Ong¹
¹Michigan Technological University, Houghton, MI, ²Georgia Institute of Technology, Atlanta, GA

4:45 pm–5:00 pm

**An Implantable, Wireless Device for Providing
Real-time, Controlled Mechanical Loading to
Improve Healing of Femoral Defects in Rodents**

Bradley Nelson¹, Salil Sidharthan Karipott¹, Robert Guldberg², and Keat Ghee Ong¹
¹Michigan Technological University, Houghton, MI, ²Georgia Institute of Technology, Atlanta, GA

5:00 pm–5:15 pm

**A Wireless Implantable Smart Potentiostat
for *In Vivo* Biofilm Studies in Live Rats**

Kyle Weeks¹, Menachem Tobias¹, Caeln Clark¹, Eric McDermott¹, Thomas Duquin¹, Mark Ehrensberger¹, and Albert Titus¹
¹University at Buffalo, Buffalo, NY

OP-Thurs-3-10

Room A401

Track: Cardiovascular Engineering

Thrombosis and Hemostasis

Chairs: Manu Platt, Owen McCarty

3:45 pm–4:00 pm

Measurement of Blood Coagulation Status and Coagulation Factor Levels via Photo-Optical and Mechanical Acoustic Tweezing Tests Controls

Daishen Luo¹, Erika Chelales¹, Millicent Beard¹, and Damir Khismatullin¹

¹Tulane University, New Orleans, LA

4:00 pm–4:15 pm

Shear-Induced NETosis in Sterile Occlusive Thrombosis

Xinren Yu¹, Jifu Tan², and Scott Diamond¹

¹University of Pennsylvania, Philadelphia, PA, ²Northern Illinois University, DeKalb, IL

4:15 pm–4:30 pm

A Disease and Patient-Specific Artery-on-a-Chip System to Model Thromboinflammation in Sickle Cell Disease

Tanmay Mathur¹, Jonathan Flanagan², and Abhishek Jain¹

¹Texas A&M University, College Station, TX, ²Texas Childrens Hospital, Houston, TX

4:30 pm–4:45 pm

A Thrombus Growth Model Considering Platelet Activation And Transition

Jifu Tan¹, Talid Sinno², and Scott Diamond²

¹Northern Illinois University, DeKalb, IL, ²University of Pennsylvania, Philadelphia, PA

4:45 pm–5:00 pm

Cleavage of Fibrinopeptide is Mediated by Circulating Cathepsins Whose Levels are Elevated with Age in Sickle Cell Transgenic Mice

Simone Douglas¹, Tatianna Singleton¹, Omar Ahmed¹, Niara Botchwey¹, Hannah Song¹, Rodney Averett², and Manu Platt¹

¹Georgia Institute of Technology, Atlanta, GA, ²University of Georgia, Athens, GA

5:00 pm–5:15 pm

Shear Stress Modulates Notch Signaling-Mediated Vascular Repair

Kyung In Baek¹, Chih-Chiang Chang¹, Shyr-shea Chang¹,

Marcus Roper¹, Rongsong Li¹, Tzung Hsiai¹, and Tzung Hsiai¹

¹UCLA, LA, CA

OP-Thurs-3-11

Room A403

Track: Cellular and Molecular Bioengineering

Probes and Signaling

Chairs: Wawrzyniec Dobrucki, Renita Horton

3:45 pm–4:00 pm

A Novel Assay to Probe Fluorescent Protein Resistance to Mechanical Quenching Inside Cells

Kasie Collins¹, Jennifer West¹, and Brenton Hoffman¹

¹Duke University, Durham, NC

4:00 pm–4:15 pm

PLC γ 1 as a Target to Improve Chronic Wound Healing

Xinhai Yang¹, Pamela Kreeger¹, and Kristyn Masters¹

¹University of Wisconsin-Madison, Madison, WI

4:15 pm–4:30 pm

Rational Design of FRET-Based Tension Sensors

Andrew LaCroix¹, Andrew Lynch¹, and Brenton Hoffman¹

¹Duke University, Durham, NC

4:30 pm–4:45 pm

Single Molecule Tension Probe for Characterization of Mechanical Cues on Cell Signaling Pathways

Byoung Choul Kim¹

¹Incheon National University, Incheon, Korea, Republic of

4:45 pm–5:00 pm

Elucidating Binding Dynamics in Multivalent Protein-Protein Interactions

Wesley Errington¹, Bence Bruncsics², and Casim Sarkar¹

¹University of Minnesota, Minneapolis, MN, ²Budapest University of Technology and Economics, Budapest, Hungary

5:00 pm–5:15 pm

Heterotypic Interactions with an Endothelial Lumen Increase Neutrophil Lifetime and Motility to *Pseudomonas Aeruginosa* via IL6 Signaling

Laurel E. Hind¹, Patrick N. Ingram¹, David J. Beebe¹, and Anna Huttenlocher¹

¹University of Wisconsin-Madison, Madison, WI

OP-Thurs-3-12

Room A404

Track: Cellular and Molecular Bioengineering

ImmunoEngineering

Chairs: Gregory Szeto, Chris Jewell

3:45 pm–4:00 pm

Increased MicroRNA-181 Expression Alters Phagocytosis Function in Macrophages

John Henderson¹, Gangjian Qin¹, Jianyi Zhang¹, and Prasanna Krishnamurthy¹

¹University of Alabama at Birmingham, Birmingham, AL

4:00 pm–4:15 pm

Lymph Node Delivery of Immunomodulatory Depots to Induce Selective Tolerance in Type 1 Diabetes

Joshua Gammon¹ and Christopher Jewell^{1,2,3,4,5}

¹University of Maryland, College Park, MD, ²University of Maryland Medical School, Baltimore, MD, ³Robert E. Fischell Institute for Biomedical Devices, College Park, MD, ⁴Marlene and Stewart Greenebaum Cancer Center, Baltimore, MD, ⁵United States Department of Veterans Affairs, Washington DC, MD

4:15 pm–4:30 pm

Trail-Conjugated Liposomes that Kill Colorectal Cancer Metastases in the Lymph Nodes

Joshua Greenlee¹, Zhenjiang Zhang¹, Dai Lui¹, Fang Yu¹, and Michael King¹

¹Vanderbilt University, Nashville, TN

4:30 pm–4:45 pm

TRAIL-coated Leukocytes to Kill Circulating Tumor Cells in the Flowing Blood from Prostate Cancer Patients

Nerymar Ortiz Otero^{1,2}, Jocelyn Marshall³, Tejas Subramanian¹, Deepack M. Sahasrabudhe⁴, Edward M. Messing⁴, and Michael R. King¹

¹Vanderbilt University, Nashville, TN, ²Cornell University, Ithaca, NY, ³Cornell University, New York, NY, ⁴University of Rochester Medical Center, Rochester, NY

4:45 pm–5:00 pm

DNA Netosis Engineered to Ensnare and Kill Disseminated Tumor Cells

Thong Cao¹ and Michael R King¹

¹Vanderbilt University, Nashville, TN

5:00 pm–5:15 pm

An Optimized Method to Edit Genes in Short-Lived Primary Human Neutrophils Using CRISPR-Cas9

Yuqi Zhu¹ and Sriram Neelamegham¹

¹University at Buffalo, Buffalo, NY

OP-Thurs-3-13

Room A405

Track: Nano and Micro Technologies

Micro/Nano Fluidic Engineering and Lab-on-Chip Systems

Chairs: Xiaolong Luo, Jon Dobson

3:45 pm–4:15 pm

Laser-Induced Hydrogel Degradation for Fabrication of 3D, Biomimetic Microfluidic Networks

John Slater¹

¹University of Delaware



4:15 pm–4:30 pm

A Portable Platelet Apheresis System

Ketan Bhatt¹, Hongjun Song¹, Dustin Haithcock¹, Prabhakar Pandian¹, and Kapil Pant¹

¹CFD Research Corporation, Huntsville, AL

4:30 pm–4:45 pm

Decoding of Code-Multiplexed Coulter Signals via Convolutional Neural Networks

Ningquan Wang¹, Ruxiu Liu¹, and A. Fatih Sarioglu¹

¹Georgia Institute of Technology, Atlanta, GA

4:45 pm–5:00 pm

A Microfluidic Approach for Geometric and Viscoelastic Screening of Hydrogel Microparticles

Ye Niu¹, Lin Qi¹, and Yi Zhao¹

¹The Ohio State University, Columbus, OH

5:00 pm–5:15 pm

Oscillatory Inertial Microfluidics for Label-Free, Micron-Scale Bioparticle Manipulation

Baris Mutlu¹, Jon Edd², and Mehmet Toner¹

¹Harvard Medical School / MGH, Boston, MA, ²MGH, Boston, MA

OP-Thurs-3-14

Room A406

Track: Drug Delivery & Intelligent Systems, Cancer Technologies

Drug Delivery for Immunomodulation and Immunotherapy

Chairs: Darrell Irvine, John Wilson

3:45 pm–4:15 pm

Controlling HIV Vaccine Kinetics and Immunogen Presentation via Alum-binding env Antigens

Darrell Irvine¹

¹Massachusetts Institute of Technology, Cambridge, MA



4:15 pm–4:30 pm

Rationally Designed Nanoparticles Enhance Antitumor Efficacy of 2'3'-cGAMP

Daniel Shae¹, Kyle Becker¹, Plamen Christov¹, Sema Sevimli¹, Abigail Lytton-Jean², Mark Kelley¹, Manuel Ascano¹, Douglas Johnson¹, and John Wilson¹

¹Vanderbilt University, Nashville, TN, ²Massachusetts Institute of Technology, Boston, MA

4:30 pm–4:45 pm

Modulating Macrophage Polarization Through CCR2 Inhibition and Multivalent Engagement

Michael Deci¹ and Juliane Nguyen¹

¹University at Buffalo, Buffalo, NY

4:45 pm–5:00 pm

Delivery of CIB1-siRNA Via Macrophage Horizontal Gene Transfer in an Orthotopic Mouse Breast Cancer Model

Elizabeth Wayne¹, Christian Long¹, Yirun Li¹, Matthew Haney¹, Leslie Parise¹, Tina Leisner¹, Elena Batrakova¹, and Alexander Kabanov¹
¹University of North Carolina-Chapel Hill, Chapel Hill, NC

5:00 pm–5:15 pm

Nanostructured Lipid Carriers for *In Vivo* Delivery of Self-Replicating RNA Vaccines

Amit Khandhar¹, Jesse H. Erasmus¹, Jeff Guderian¹, Brian Granger¹, Jacob Archer¹, Michelle Archer¹, Emily Gage^{1,2}, Jasmine Fuerte-Stone¹, Elise Larson¹, Susan Lin¹, Rhea N. Coler^{1,2,3}, Christopher B. Fox^{1,2}, Dan T. Stinchcomb¹, Steve Reed^{1,2,3}, and Neal Van Hoesven^{1,2,3}
¹Infectious Disease Research Institute, Seattle, WA, ²University of Washington, Seattle, WA, ³PAI Life Sciences Inc., Seattle, WA

OP-Thurs-3-15

Room A407

Track: Bioinformatics, Computational and Systems Biology

Systems Approaches to Therapy, Therapeutics, and Precision Medicine

Chairs: William Richardson, Xiling Shen

3:45 pm–4:00 pm

Profiling Heterogeneous Gene-expression States in Luminal Breast Tumors at Diagnosis

Shambhavi Singh¹, Lixin Wang¹, Kathy Repich¹, Dylan Schaff¹, Jennifer Harvey¹, and Kevin Janes¹
¹University of Virginia, Charlottesville, VA

4:00 pm–4:15 pm

CRISPR/CAS9-Mediated, High-Throughput Measurement of Gene Expression Dynamics Identify Synergistic Drug Targets in Triple-Negative Breast Cancer

Joseph Decker¹, Matthew Hall¹, Rachel Blaisdell¹, Jacqueline Jeruss¹, and Lonnie Shea¹
¹University of Michigan, Ann Arbor, MI

4:15 pm–4:30 pm

Computational Simulation of First-Line Tuberculosis Antibiotics Guide the Design of Optimal Regimens

Joseph Cicchese¹, Veronique Dartois², Denise Kirschner³, and Jennifer Linderman¹
¹University of Michigan, Ann Arbor, MI, ²Rutgers, The State University of New Jersey, Newark, NJ, ³University of Michigan Medical School, Ann Arbor, MI

4:30 pm–4:45 pm

Cell-Free DNA Profiling of Peritoneal Fluid is a Novel Test for Peritoneal Dialysis-Associated Infection

Fanny Chen¹, Philip Burnham¹, Alexandre Pellan Cheng¹, Vesh Srivatana², Lars F Westblade³, Manikkam Suthanthiran³, John Richard Lee³, and Iwijn De Vlaminc¹
¹Cornell University, Ithaca, NY, ²The Rogosin Institute, New York, NY, ³Weill Cornell Medicine, New York, NY

4:45 pm–5:00 pm

Moving Beyond Genetic Mutations to Predict Response to Targeted Therapies

Molly J. Carroll¹, Harin A. Patel¹, C. David Page², and Pamela K. Kreeger^{1,2}
¹University of Wisconsin-Madison, Madison, WI, ²University of Wisconsin School of Medicine and Public Health, Madison, WI

5:00 pm–5:15 pm

Inference of Cytokine Networks in Sputum and Peripheral Blood Associated with AE-COPD

Katy Norman¹, Christine Freeman^{1,2}, Neha Bidthanapally¹, MeiLan Han¹, Fernando Martinez³, Jeffrey Curtis^{1,2}, and Kelly Arnold¹
¹University of Michigan, Ann Arbor, MI, ²VA Ann Arbor Healthcare System, Ann Arbor, MI, ³Weill Cornell Medical College, New York, NY

OP-Thurs-3-16

Room A303

Track: Neural Engineering

Repair and Regeneration of Brain and Spinal Cord

Chairs: Rebecca Wachs, Lisa Flanagan

3:45 pm–4:00 pm

Immunoengineering Brain Repair Through mRNA-Enhanced MSC Delivery

Syed Faaiz Enam¹, Philip Santangelo², and Ravi Bellamkonda¹
¹Duke University, Durham, NC, ²Georgia Institute of Technology, Atlanta, GA

4:00 pm–4:15 pm

Affinity-based Delivery of Thermostabilized Chondroitinase ABC for Central Nervous System Repair

Marian Hettiaratchi¹, Samantha Payne¹, Carter Teal¹, and Molly Shoichet¹
¹University of Toronto, Toronto, ON, Canada

4:15 pm–4:30 pm

Engineered, Injectable Hydrogel to Deliver and Engraft Schwann Cells for Functional Recovery after Spinal Cord Injury

Laura Marquardt¹, Vanessa Doulames², Alice Wang¹, Karen Dubbin¹, Giles Plant², and Sarah Heilshorn¹
¹Stanford University, Stanford, CA, ²Stanford University School of Medicine, Stanford, CA

4:30 pm–4:45 pm

Discovering Spatiotemporal Patterns of Aggrecan Fragmentation After Spinal Cord Injury

Michaela McCrary¹, Young-Hye Song¹, Stacy Porvasnik¹, Rebecca Wachs^{1,2}, Amanda Fosang^{3,4}, and Christine Schmidt¹
¹University of Florida, Gainesville, FL, ²University of Nebraska-Lincoln, Lincoln, NE, ³The University of Melbourne, Melbourne, Australia, ⁴Murdoch Childrens Research Institute, Melbourne, Australia

4:45 pm–5:00 pm

Synthetic Platelets Reduce Neuroinflammation in Experimental Traumatic Brain Injury

Jordan Todd¹, Vimala Bharadwaj¹, Kimberly Nellenbach², Seema Nandi², Emily Mihalko², Ashley Brown², and Sarah Stabenfeldt¹
¹Arizona State University, Tempe, AZ, ²North Carolina State University/University of North Carolina, Raleigh, NC

5:00 pm–5:15 pm

A 3D Scaffold and Human Cell Neurovascular Niche *In Vitro* and in Stroke Models

Janahan Arulmoli¹, Duc Phan¹, Christopher Hughes¹, and Lisa Flanagan¹
¹University of California, Irvine, Irvine, CA

OP-Thurs-3-17

Room A304

Track: Orthopedic and Rehabilitation Engineering, Tissue Engineering

Musculoskeletal Tissue Engineering II

Chairs: Nathan Schiele, Christopher Wagner

3:45 pm–4:00 pm

Acellular Mineralization on 3D Printed Poly-Caprolactone Scaffolds with Differential Surface Chemistry

Sumit Murab¹, Stacey Gruber², Chia-Ying James Lin², and Patrick Whitlock¹

¹Cincinnati Children's Hospital Medical Center, Cincinnati, OH, ²University of Cincinnati, Cincinnati, OH

4:00 pm–4:15 pm

Creation of a 3D Bone Tissue Model to Study Bone Loss in Microgravity

Riccardo Gottardi¹, Vincenzo Rotolo², Alireza Khalajzadeh², Abhijit Roy¹, Prashant Kumta¹, Manuela Raimondi², Peter Alexander¹, and Rocky Tuan¹

¹University of Pittsburgh, Pittsburgh, PA, ²Politecnico di Milano, Milano, Italy

4:15 pm–4:30 pm

Force Bioreactor for Assessing Temporal Relationships Between Controlled Drug Release and Myofibroblast Functional Response in Tissue Fibrosis

Edward Sander¹, Keerthi Atluri², Alyssa Mendenhall², Zubair Elsheikh², Aliasger Salem², and James Martin²

¹University of Iowa, Iowa City, IA, ²The University of Iowa, Iowa City, IA

4:30 pm–4:45 pm

Titanium Mesh as a Low-Profile Alternative to Tension Band Wiring for Repairing Olecranon Fractures

Christina Salas¹, Jasmin Regalado¹, Darielys Mejias-Morales¹, Fermin Prieto¹, Kavita Vakharia¹, and Deana Mercer¹

¹University of New Mexico, Albuquerque, NM

4:45 pm–5:00 pm

Evaluation of Diffusion in The Dual-Hydrogel System

Chi-Chun Pan¹, Sungwoo Kim¹, and Yunzhi Peter Yang¹

¹Stanford University, Stanford, CA

5:00 pm–5:15 pm

Implantable Strain Sensor for Non-Invasively Monitoring the Mechanical Environment Post-Fracture

Brett Klosterhoff¹, Keat Ghee Ong², Nick Willett³, and Robert Guldberg⁴

¹Georgia Institute of Technology, Atlanta, GA, ²Michigan Technological University, Houghton, MI, ³Emory University, Atlanta, GA, ⁴University of Oregon, Eugene, OR

OP-Thurs-3-18

Room A408

Track: Translational Biomedical Engineering

Preclinical Models

Chairs: Mark Van Dyke

3:45 pm–4:15 pm

Clinically Relevant Models of Musculoskeletal Trauma and Immune Dysregulation

Robert Guldberg¹

¹Georgia Tech/Emory University, Atlanta, GA



4:15 pm–4:30 pm

Ultrasound Treatment of DSS-Induced Ulcerative Colitis Acts Through the Cholinergic Anti-Inflammatory Pathway

Natalia Nunes^{1,2}, Maggie Sundby¹, Parwathy Chandran¹,

Fernanda Visioli³, Scott Burks¹, Ana Paz², and Joseph Frank^{1,4}

¹National Institutes of Health, Clinical Center, Frank Lab, Bethesda, MD, ²Gastroenterology and Hepatology Sciences Graduate Program, UFRGS, Porto Alegre, Brazil, ³Faculty of Dentistry, Oral Pathology, UFRGS, Porto Alegre, Brazil, ⁴National Institute of Biomedical Imaging and Bioengineering, NIH, Bethesda, MD

4:30 pm–4:45 pm

Targeting Cadherin-11 Genetically and Pharmacologically Reduces Renal Fibrosis

Tessa Huffstater¹, Leslie Gewin¹, and W. David Merryman¹

¹Vanderbilt University, Nashville, TN

4:45 pm–5:00 pm

Installation of a Quality Management System for Translation of Medical Device Technologies from Academic Research to Commercialization

Brandis Keller¹ and Duncan Maitland¹

¹Texas A&M University, College Station, TX

5:00 pm–5:15 pm

Heat Shock Protein Expression Following Laser Irradiation in an *In Vitro* and *In Vivo* Model

Neda Parchami¹, G Naga Kiran¹, Esra Alrawi¹, and Kunal Mitra¹

¹Florida Tech, Melbourne, FL

OP-Thurs-3-19

Room A409

Track: Biomedical Engineering Education (BME)

Novel Pedagogy

Chairs: Rebecca L. Heise, Wendy Newstetter

3:45 pm–4:00 pm

Service Learning Approaches to Improve Healthcare in Low Resource Settings

Maddy Bishop-Van Horn¹ and Ben Fleishman¹
¹*Engineering World Health, Chapel Hill, NC*

4:00 pm–4:15 pm

Incorporating Self-Reflection and Metacognition in a Required Fundamentals of Bioengineering Course

Jennifer Choi¹
¹*University of California Davis, Biomedical Engineering, Davis, CA*

4:15 pm–4:30 pm

A Case Study Approach for Teaching Undergraduate Biomaterials

Kareen LK Coulombe¹ and Vicki L Colvin¹
¹*Brown University, Providence, RI*

4:30 pm–4:45 pm

Creating Social Value in an Undergraduate Human-Centered Design Course Through STEM Education for Chronically Ill Children

Elaissa Hardy^{1,2,3}, Joseph Le Doux², and Wilbur Lam^{1,2,3}
¹*Emory University, Atlanta, GA*, ²*Georgia Institute of Technology, Atlanta, GA*, ³*Children's Healthcare of Atlanta, Atlanta, GA*

4:45 pm–5:00 pm

Instrumenting Force Sensitive Resistors for Teaching Module in Measurements Laboratory

Johnathan George¹ and Thomas Roussel¹
¹*University of Louisville, Louisville, KY*

5:00 pm–5:15 pm

CellSpark: A Simulation Tool to Spark Discovery Learning of Electrophysiology

Tyler Harvey¹ and Delphine Dean¹
¹*Clemson University, Clemson, SC*

SPECIAL SESSIONS

3:45 pm–5:15 pm

Room A301

DEBUT Winner Presentations and Award Ceremony

Chairs: Zeynep Erim, Phil Weilerstein

The winners of the DEBUT (Design by Undergraduate Biomedical Teams) jointly sponsored by the National Institute of Biomedical

Imaging and Bioengineering (NIBIB) and VentureWell, will present their projects and receive their awards. The session will conclude with a talk on "Next steps in the path to commercialization" by Colin J.H. Brenan, Founder and Chief Commercial Officer of HiFiBiO BV, Editor-in-Chief of IEEE PULSE Magazine.

3:45 pm–5:15 pm

Room A310

Novel Photoacoustic Imaging: Systems, Computation, and Agents

Chairs: Junjie Yao, Muyinatu Bell

The special session will feature four world-leading experts on the latest breakthroughs in photoacoustic imaging, including Drs. Lihong V. Wang (Caltech, USA), Stanislav Emelianov (Georgia Tech, USA), Daniel Razansky (TUM, Germany), and Chulhong Kim (POSTECH, South Korea). Photoacoustic imaging, also referred to as optoacoustic imaging, is most sensitive to rich optical absorption contrast and has overcome the fundamental depth limit of high-resolution optical imaging. The image resolution, as well as the maximum imaging depth, is highly scalable with the optical and acoustic configurations at depths up to several centimeters in biological tissues. Photoacoustic imaging can provide anatomical (e.g., tumor angiogenesis and artery plaque), functional (e.g., neuronal activity and ischemic hypoxia), and molecular information (e.g., protein-protein interaction and gene expression) of living tissues. Photoacoustic imaging is a valuable tool for personalized medicine, using numerous exogenous contrast agents (e.g., organic dyes, metallic and nonmetallic nanoparticles, and reporter gene products) with biomarkers. The invited speakers will collectively cover four exciting topics: (1) Omniscale photoacoustic imaging from organelles to patients, (2) ultrafast photoacoustic imaging of biological functions and dynamics, (3) contrast agents for theranostic photoacoustic imaging, and (4) clinical and commercial translation of photoacoustic imaging.

Track: Stem Cell Engineering

Advanced Biomanufacturing and Translation of Stem Cell-Derived Therapies and Tissues

TH-1

Expansion of eCB-MSCs from Multiple Donors on Microcarriers in Stirred Suspension Bioreactors

Erin Roberts¹, Tiffany Dang¹, Sarah Lepage², Amir Alizadeh², Thomas Koch², and Michael Kallos¹
¹University of Calgary, Calgary, AB, Canada, ²University of Guelph, Guelph, ON, Canada

TH-2

A Robust Assay of Exosome Immunomodulatory Potency

Seth Andrews¹, Timothy Maughon¹, and Steven Stice¹
¹University of Georgia, Athens, GA

TH-3

Scalable and Physiologically Relevant Culture System for Biomanufacturing Human Pluripotent Stem Cells

Qiang Li¹, Haishuang Lin¹, Ou Wang¹, and Yuguo Lei¹
¹University of Nebraska-Lincoln, Lincoln, NE

TH-4

Layer-by-Layer Assemblies of Collagen/Heparin Towards the Manufacturing of Human Mesenchymal Stem Cells

David Castilla-Casadiegos¹, Jose Garcia², Wilbur Lam², Andrés J. García², and Jorge Almodovar¹
¹University of Puerto Rico Mayaguez, Mayaguez, PR, ²Georgia Institute of Technology, Atlanta, GA

TH-5

Biophysical Regulation of Histone Modification and Chromatin Architecture in Mesenchymal Stem Cells

Kiera Yankson^{1,2}, Su Chin Heo^{1,2}, Melike Lakadamyali¹, and Robert Mauck^{1,2}
¹University Of Pennsylvania, Philadelphia, PA, ²Center of Engineering Mechanobiology, Philadelphia, PA

Track: Tissue Engineering

Advanced Biomanufacturing in Tissue Engineering

TH-6

Deep Learning Prediction of Tissue Level Function of Retinal Pigment Epithelial Cell Monolayers

Nicholas Schaub^{1,2}, Nathan Hotaling³, Qin Wan³, Kapil Bharti³, and Carl Simon²
¹University of Michigan, Ann Arbor, MI, ²National Institute of Standards and Technology, Gaithersburg, MA, ³National Institutes of Health, Bethesda, MA

TH-7

The Feasibility of a Portable Electrospinning Device for Wound Repair

Zachary Brooks¹, Joshua Pilcher¹, Corey Brann¹, Mariah Richards¹, and Nasim Nosoudi²
¹Wright State University, Dayton, OH, ²wright State University, Dayton, OH

TH-8

Additive Manufacturing Approach for Inducing Anisotropy in the Cellular Microenvironment

Merve Buluk¹ and Justin Brown¹
¹The Pennsylvania State University, University Park, PA

TH-9

3D Bioprinting + Near-Field Electrospinning Bone-Ligament Interface Scaffolds

Fermin Prieto¹, Christopher Buksa¹, Darielys Mejias-Morales¹, Ava Mauser¹, Emma Garcia¹, Matthew Rush¹, Steven Nery¹, and Christina Salas¹
¹University of New Mexico, Albuquerque, NM

TH-10

Development of a Thixotropic Collagen-Hyaluronic Acid Hydrogel for Improved Bioprinting

Casey Clark^{1,2}, Hema Sivakumar¹, and Aleksander Skardal^{1,2}
¹Wake Forest Institute for Regenerative Medicine, Winston Salem, NC, ²Virginia Tech-Wake Forest University School of Biomedical Engineering and Sciences, Winston Salem, NC

TH-11

Bioprintable Alginate-Gelatin Bioink For Three-Dimensional Cell Culture: A Tool for Cancer Research.

Salvador Flores-Torres¹, José Gil Munguia-López¹, Tao Jiang¹, Jacqueline Kort-Mascort¹, and Joseph M. Kinsella¹
¹McGill University, Montreal, QC, Canada

TH-12

Shape-Shifting Tissues: Soft Tissue Constructs with Integrated Programmable Shape Memory Function

Nikita Kalashnikov¹ and Christopher Moraes¹
¹McGill University, Montreal, QC, Canada

TH-13

Tooth Restoration With 3D Printing Application

Diana Cho¹ and Namsoo Kim²
¹Printing Nano Engineering Lab, El Paso, TX, ²University of Texas at El Paso, El Paso, TX

TH-14

Investigating the Use of Low-cost Bioprinting for the Fabrication of Complex Tissue Scaffolds

Robert Warren¹, Carolina Leynes², and Joseph Freeman¹
¹Rutgers University, Piscataway, NJ, ²University of Texas Rio Grande Valley, Edinburg, TX

TH-15

Effect of Cell Density on Cryoprotectant Transport in Tissues

Ross Warner¹ and Adam Higgins¹
¹Oregon State University, Corvallis, OR

Thursday, October 18 | 9:30 am–5:00 pm | GWCC Exhibit Hall

Poster Viewing with Authors & Refreshment Break | 9:30 am–10:15 am and 3:00 pm–3:45 pm

Track: Nano and Micro Technologies**Advances in Micro/Nano Manufacturing in Biomedicine**

TH-16

Janus Gold Nanoplates: Dual Coated Amphiphilic Gold Nanoplates for Supramolecular AssemblyEmatias Chowdhury¹, Robert Keynton¹, and Martin O'Toole¹
¹University of Louisville, Louisville, KY

TH-17

A 3D Bioprinter For Vascularized Tissue ConstructsOlurotimi Bolonduro¹ and Brian Timko¹
¹Tufts University, Medford, MA

TH-18

Flash Technology Based Self-assembly for Lipid Coating of MSN and Nano-therapeuticsHanze Hu¹, Mingqiang Li¹, and Kam Leong¹
¹Columbia University, New York, NY

TH-19

Metal Nanostructures Synthesized in Water Microdroplets for Biomedical ApplicationsJae Kyoo Lee¹, Devleena Samanta¹, Hong Gil Nam², and Richard Zare¹
¹Stanford University, Stanford, CA, ²DGIST, Daegu, Korea, Republic of

TH-20

Freestanding Nanoporous Membranes with Tunable Pore Size for the Separation of Extracellular VesiclesMarcela Mireles^{1,2}, Cody Soule², and Thomas Gaborski^{1,2}
¹University of Rochester, Rochester, NY, ²Rochester Institute of Technology, Rochester, NY

TH-21

Thermoresponsive Membrane for Increased Collection Efficiency in BioseparationsMarcela Mireles^{1,2}, Cody Soule², and Thomas Gaborski^{1,2}
¹University of Rochester, Rochester, NY, ²Rochester Institute of Technology, Rochester, NY

TH-22

Low-cost Thickness-variant Ultrathin Porous Polymeric Membranes for Blood Brain Barrier ModelsShayan Gholizadeh¹, Robert Carter¹, Zahra Allahyari¹, Marcela Mireles Ramirez^{1,2}, and Thomas Gaborski^{1,2}
¹Rochester Institute of Technology, Rochester, NY, ²University of Rochester, Rochester, NY

TH-23

Non-fouling Micro-patterned Surface for Study of Pore Contribution In Cell-Substrate InteractionsZahra Allahyari¹, Shayan Gholizadeh¹, Stephanie M. Casillo¹, and Thomas R. Gaborski^{1,2}
¹Rochester Institute of Technology, Rochester, NY
²University of Rochester, Rochester, NY

TH-24

"All-in-one" Wound Dressings Based on Expanded 3D Electrospun Nanofiber SpongesJingwei Xie¹ and Shixuan Chen¹
¹University of Nebraska Medical Center, Omaha, NE**Track: Bioinformatics, Computational and Systems Biology, Cellular and Molecular Bioengineering****Analysis of Cell Signaling**

TH-25

Metrics for Regulated Biochemical Reaction SystemsJacob Davis¹ and Eberhard Voit¹
¹Georgia Institute of Technology and Emory University, Atlanta, GA

TH-26

Mechanically Coupled Intracellular Calcium Oscillations Mediate Gap Closure in a Stromal Wound Healing ModelSamuel Ghilardi¹, Jeroen Eyckmans^{1,2}, and Allyson Sgro¹
¹Boston University, Boston, MA, ²Harvard University-Wyss Institute for Biologically Inspired Engineering, Boston, MA

TH-27

Systems Analysis Identifies Fingolimod Therapy for Astrocyte Activation in Mucopolidosis IVLevi Wood¹, Laura Weinstock¹, Amanda Furness², Shawn Herron², Sierra Smith², Sitara Sankar¹, Samantha DeRosa², Dadi Gao², Molly Mepnyans², Anna Scotto Rosato³, Diego Medina³, Ayelet Vardi⁴, Natalia Ferreira⁵, Soo Min Cho⁴, Anthony Futerman⁴, Susan Slangenaupt², and Yulia Grishchuk²
¹Georgia Institute of Technology, Atlanta, GA, ²Massachusetts General Hospital, Boston, MA, ³Telethon Institute of Genetics and Medicine, Pozzuoli, Italy, ⁴Weizmann Institute of Science, Rehovot, Israel, ⁵University of Zurich-Vetsuisse, Zurich, Switzerland

TH-28

A Multiscale Model Predicts Self-Limiting Multivalent Ligand-Receptor Assembly in the Cell MembraneDipak Barua¹, Md Shahinuzzaman¹, and Jawahar Khetan¹
¹Missouri University of Science and Technology, Rolla, MO

TH-29

The Effects of IKK β Inhibition on Early NF-KB Activation and Transcription of Downstream GenesMeghan Bloom¹, George Swain¹, Anna Sorace¹, Thomas Yankeelov¹, and Marcelo Behar¹
¹University of Texas-Austin, Austin, TX

TH-30

Computational Model of FGF and VEGF Signaling Interactions in AngiogenesisMin Song¹ and Stacey Finley¹
¹University of Southern California, Los Angeles, CA

TH-31

Modeling Mitotic Cell Cycle in Human Cells and its Dysregulation during Cellular PerturbationYongwoon Jung¹, Katie Cataldo¹, Terhune Scott¹, and Dash Ranjan¹
¹Medical College of Wisconsin, Milwaukee, WI

TH-32

Exploring the Impact of Local Ligand Flexibility on B Lymphocyte Signaling via a Platform DNA Origami NanostructureChristopher Lucas¹, Emily Briggs¹, Randy Patton¹, Molly Mollica¹, Emily McWilliams¹, John Byrd¹, Virginia Sanders¹, and Carlos Castro¹
¹The Ohio State University, Columbus, OH

TH-33

Modeling TGF- β -induced Epithelial-Mesenchymal Transition Dynamics

Mario J. Mendez¹, Christopher A. Lemmon¹, and Seth H. Weinberg¹
¹Virginia Commonwealth University, Richmond, VA

TH-34

Modeling Competitive Tuning of PDZ Domains

Patrick Giolando¹, Matthew Pharris¹, and Tamara Kinzer-Ursem¹
¹Purdue University, West Lafayette, IN

TH-35

Elucidating Heme Signaling as a Driver of Neuronal and Glial Dysfunction in Neurodegeneration

Sitara Sankar¹, Mary Catherine Bryant¹, Kajol Shah¹, Rebecca Donegan¹, David Hanna¹, Amit Reddi¹, and Levi Wood¹
¹Georgia Institute of Technology, Atlanta, GA

TH-36

Cx43 Regulates β -catenin Activity in Osteocytic Cells

Yue Zhang¹, Michael Friedman¹, Prerna Yadav¹, and Henry Donahue¹
¹Virginia Commonwealth University, Richmond, VA

TH-37

Mg²⁺ Induces Osteogenesis Through the Activation of Canonical Wnt Signaling in hBMSCs

Chu-Chih Hung¹, Kai Liu¹, and Charles Sfeir¹
¹University of Pittsburgh, Pittsburgh, PA

TH-38

Pleiotropic Effect of Glycan Perturbation on Cell Signaling

Xinheng Yu¹, Theodore Groth¹, and Sriram Neelamegham¹
¹SUNY University at Buffalo, Buffalo, NY

TH-39

The Regulatory Subunit of Protein Kinase a Acts as a Switch in the Control of Cell Polarity

Rebecca LaCroix¹, Benjamin Lin², and Andre Levchenko¹
¹Yale University, New Haven, CT, ²New York University, New York, NY

Track: Bioinformatics, Computational and Systems Biology

Analysis of Multi-Cellular Systems

TH-40

Automated Graph-Based Quantification of Complex Multi-Cellular Formations in Imaging Data

William Pilcher¹, Anastasia Zhurikhina¹, Olga Chernaya¹, Xingyu Yang¹, Peng Qiu¹, and Denis Tsygankov¹
¹Georgia Institute of Technology, Atlanta, GA

TH-41

Integrating Whole-Cell and Agent-Based Models of Diauxic Shift in Escherichia coli

Lee Talman¹, Eran Agmon², Markus Covert², and Shayn M. Peirce¹
¹University of Virginia, Charlottesville, VA, ²Stanford University, Stanford, CA

TH-42

A Comprehensive Metric for Quantifying the Spatial Organization of the Bone Marrow Microenvironment

Connor Healy¹ and Tara Deans¹
¹University of Utah, Salt Lake City, UT

TH-43

Computational Model and Experimental Design of Mixed 2D Mouse Colon Monolayer Culture System

Scott Holmes¹, Raehyun Kim¹, Nancy Allbritton¹, and Shawn Gomez¹
¹University of North Carolina, Chapel Hill, Chapel Hill, NC

TH-44

3D Characterization of Mitochondrial Morphology in Yeast Libraries

Gordon Sun¹, Linhao Ruan¹, Andrei Kucharavy¹, and Rong Li¹
¹Johns Hopkins University, Baltimore, MD

Track: Cellular and Molecular Bioengineering

Bioenergetics and Metabolism

TH-45

A Bioenergetic Investigation of the Effect of Addition of a Polymeric Protein in a Cryoprotective Formulation

Lukas Underwood¹, Eric Rosiek¹, Quinn Osgood², Nilay Chakraborty¹, and Jason Solocinski¹
¹University of Michigan Dearborn, Dearborn, MI, ²OtziBio LLC, Dearborn, MI

TH-46

Characterization of Metabolic Activity of CISD2 Overexpressed Cells

Eric Rosiek¹, Lukas Underwood¹, Jason Solocinski¹, Quinn Osgood², Manal Makki¹, and Nilay Chakraborty¹
¹University of Michigan Dearborn, Dearborn, MI, ²OtziBio LLC, Dearborn, MI

TH-47

Modulation of Mitochondrial Function in Cardiac Myocytes by the Extracellular Matrix

Davi M. Lyra-Leite¹, Allen M. Andres², Andrew P. Petersen¹, Nethika R. Ariyasinghe¹, Nathan Cho¹, Suyon Sarah Kim¹, Roberta A. Gottlieb², and Megan L. McCain^{1,3}
¹Laboratory for Living Systems Engineering, Department of Biomedical Engineering, USC Viterbi School of Engineering, University of Southern California, Los Angeles, CA, ²Heart Institute and Barbra Streisand Women's Heart Center, Cedars-Sinai Medical Center, Los Angeles, CA, ³Department of Stem Cell Biology and Regenerative Medicine, Keck School of Medicine of USC, University of Southern California, Los Angeles, CA

TH-48

The Protective Role of Shear Stress on Endothelial Cell eNOS O-GlcNAcylation

Sarah Basehore¹ and Alisa Morss Clyne¹
¹Drexel University, Philadelphia, PA

TH-49

Identifying the Active Sphingolipid Metabolic Pathways in Healthy and Sick Red Blood Cells

Ryan Rudy¹, Nathan Chiappa¹, and Edward Botchwey¹
¹Georgia Institute of Technology, Atlanta, GA

Thursday, October 18 | 9:30 am–5:00 pm | GWCC Exhibit Hall

Poster Viewing with Authors & Refreshment Break | 9:30 am–10:15 am and 3:00 pm–3:45 pm

Track: Respiratory Bioengineering**Bioengineering Approaches to Lung Development, Regeneration, Repair and Replacement****TH-50****An Agent-based Computational Model of Tissue Self-healing Applied to Pulmonary Fibrosis**Bela Suki¹ and Jason Bates²¹Boston University, Boston, MA, ²University of Vermont, Burlington, VT**Track: Biomechanics****Biofluid Mechanics****TH-51****Laboratory Development of Hybrid Comprehensive Stage II Procedure for Treatment of Congenital Heart Disease**Arka Das¹, Raajesh Kumar Murugesan¹, Eduardo Divo¹, Alain Kassab², and William Decamp³¹Embry-Riddle Aeronautical University, Daytona Beach, FL, ²University of Central Florida, Orlando, FL, ³Arnold Palmer Hospital for Children, Orlando, FL**TH-52****Biomechanics of Fluid and Cell transport in the Lymphatic System**Huabing Li^{1,2}, Yumeng Mei², Timothy Padera³, James Baish⁴, and Lance Munn³¹Massachusetts General Hospital, Charlestown, MA, ²Guilin University of Electronic Technology, Guilin, China, People's Republic of, ³Harvard Medical School, Charlestown, MA, ⁴Bucknell University, Lewisburg, PA**TH-53****Characterization of Sickle Blood Flow Velocity In Response To Cell Volume Dilation Using a Microfluidic Platform**José M. Valdez¹, Athena Geisness¹, John Higgins^{2,3}, and David Wood¹¹University of Minnesota, Minneapolis, MN, ²Harvard University, Cambridge, MA, ³Massachusetts General Hospital, Boston, MA**TH-54****Theory and Benchtop Model of Perivascular Hydrodynamic Reverse Transport for Cerebral Beta-Amyloid Clearance**Mikhail Coloma¹, J. David Schaffer¹, Paul Chiarot¹, and Peter Huang¹¹SUNY Binghamton, Binghamton, NY**TH-55****Effects of Vaccination and Blood Vessel Distribution on Lymph Node Transport Phenomena**Mohammad Jafarnejad¹, Willy Bonneuil², Josh Scallan³, Ahmed Ismail², Gowsihan Poologasundarampillai⁴, Joseph M. Sherwood², Delfim Duarte², Michael J. Davis⁵, Cristina Lo Celso², David C. Zawieja⁶, and James E. Moore Jr.²¹Johns Hopkins University, Baltimore, MD, ²Imperial College London, London, United Kingdom, ³University of South Florida, Tampa, FL, ⁴University of Birmingham, Birmingham, United Kingdom, ⁵University of Missouri, Columbia, MO, ⁶Texas A&M University, College Station, TX**TH-56****Reduction of Pressure Gradient and Turbulence using Vortex Generators in Prosthetic Heart Valves**Hoda Hatoum¹ and Lakshmi Dasi¹¹The Ohio State University, Columbus, OH**TH-57****Coronary Occlusion after Transcatheter Aortic Valve Implantation: Effect of Valve Type and Positioning.**Hoda Hatoum¹, Jennifer Dollery¹, Scott Lilly¹, Juan A. Crestanello¹, and Lakshmi Dasi¹¹The Ohio State University, Columbus, OH**TH-58****Parametric Design of Cortical Bone Microstructure for in Silico Assessments**José Alberto Robles Linares-Alvelais¹, Hector R. Siller², and J. Israel Martínez-López¹¹Tecnologico de Monterrey, Monterrey, Mexico, ²University of North Texas, Denton, TX**TH-59****Effect of Atrial Function on Mitral Valve Hemodynamics after Transcatheter Mitral Valve Replacement**Shelley Gooden¹, Hoda Hatoum¹, Konstantinos Boudoulas², and Lakshmi Dasi¹¹The Ohio State University, Columbus, OH, ²The Ohio State University Wexner Medical Center, Columbus, OH**TH-60****Effect of Left Versus Right Coronary Flow Waveform on Aortic Sinus Hemodynamics, Leaflet Shear Stress, and Calcification**Dorma Flemister¹, Hoda Hatoum¹, Ryan Oba¹, Joy Lincoln^{1,2}, Juan A. Crestanello¹, and Lakshmi Dasi¹¹The Ohio State University, Columbus, OH, ²Nationwide Children's Hospital, Columbus, OH**TH-61****Design and Construction of a Magnetic Resonance Imaging Compatible Physiologic Flow Circuit**David Jiang¹, Elliott Hurd¹, Liam Morris², and Lucas Timmins¹¹University of Utah, Salt Lake City, UT, ²Galway Mayo Institute of Technology, Galway, Ireland**TH-62****A Compartmental Model of the Cerebrospinal Fluid Dynamics Between the Intracranial and Optic Nerve Subarachnoid Space**Omkar Kaskar¹, Andrey Kuznetsov¹, David Fleischman², Yueh Lee², Brian Thorp², and Landon Grace¹¹North Carolina State University, Raleigh, NC, ²University of North Carolina, Chapel Hill, NC

Track: Biomechanics

Injury Biomechanics

TH-63

Development and Validation of a Finite Element Model for an Energy-absorbing Guardrail End Terminal

Yunzhu Meng¹ and Costin Untaroiu¹
¹Virginia Tech, Blacksburg, VA

TH-64

Directional Auditory Warnings Alter Neck Muscle Activation Patterns

Mohammad Homayounpour¹, Jonathan Mortensen¹, and Andrew Merryweather¹
¹University of Utah, Salt Lake City, UT

TH-65

Injury Metric Sensitivity in FE ATDs and a Simplified HBM to Spaceflight Boundary Condition Perturbations

Derek Jones^{1,2}, James Gaewsky^{1,2}, Ashley Weaver^{1,2}, F. Scott Gayzik^{1,2}, and Joel Stitzel^{1,2}
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TH-66

Evaluation of Current Injury Assessment Reference Values in the Pediatric Population

Carrie O'Donel¹, Jamie Williams¹, and David Jamison¹
¹Robson Forensic, Inc., Lancaster, PA

TH-67

Analyzing Gait Velocity to Assess Variability in Dynamic Stability for Fall Risk Assessment

Itai Kreisler¹, Thurmon Lockhart¹, Saba Rezvanian¹, and Chris Frames¹
¹Arizona State University, Tempe, AZ

TH-68

Biomechanical Responses of Human and Animal Head Finite Element Models Under Blast Loading

Gen Fu¹, Alexandrina Untaroiu¹, Waren Hardy¹, and Costin Untaroiu¹
¹Virginia Tech, Blacksburg, VA

TH-69

Incidence and Fatal Injury Outcomes in Rollover Crashes

Luke Riexinger¹ and Hampton Gabler¹
¹Virginia Tech, Blacksburg, VA

TH-70

Influence of Vehicle Shape and Human Anthropometry on Pedestrian Kinematics in Traffic Accidents

Costin Untaroiu¹, Wansoo Pak¹, Yunzhu Meng¹, and Scott Gayzik²
¹Virginia Tech, Blacksburg, VA, ²Wake Forest University, Winston-Salem, NC

TH-71

Effects of Malocclusion on the Histology of the Mandibular Condyle Cartilage of Rats

Xinyun Liu¹, Wuyang Li¹, Michael Gold¹, and Alejandro Almarza¹
¹University of Pittsburgh, Pittsburgh, PA

TH-72

Investigation of Femoral Neck Fracture with Different chances of Q-Angle: A Biomechanical Study of Cadaveric Femur

Trung Le¹, Bich Nguyen¹, and Ha Vo^{1,2}
¹Mercer University, Macon, GA, ²Mercer School of Medicine Macon, GA

TH-73

Use of Finite Element Human Body Models in a Standardized Evaluation Protocol for Pedestrian Safety Assessment

Will Decker^{1,2}, Bharath Koya^{1,2}, Wansoo Pak², Costin Untaroiu², and F. Scott Gayzik^{1,2}
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TH-74

Evaluating Head Impact Exposure in Practice Drills Among Multiple Youth Football Teams

Mireille Kelley^{1,2}, Mark Espeland¹, William Flood^{1,2}, Alexander Powers¹, Christopher Whitlow¹, Joseph Maldjian³, Joel Stitzel^{1,2}, and Jillian Urban^{1,2}
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TH-75

Active Muscle Modeling of Finite Element Human Arm Model Using PID Controller

Karan Devane^{1,2} and Scott Gayzik^{1,2}
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TH-76

Proposed Improvements to Cervical Injury Tolerance Corridors in Lateral Bending

Sean Shimada¹ and Sean Maroney¹
¹Biomechanical Consultants, Davis, CA

TH-77

Computational Study of Traumatic Brain Injury Using MRI Based, 3D Viscoelastic Model

Tanu Khanuja¹ and Hari Krishnan N. Unni¹
¹Indian Institute of Technology Hyderabad, Hyderabad, India

Track: Biomechanics

Human Performance/Sports Biomechanics

TH-78

Unscented Kalman Filter for Estimating Knee Joint Flexion Axis Using Wearable Sensors

Lukas Adamowicz¹ and Ryan McGinnis¹
¹University of Vermont, Burlington, VT

TH-79

Changes in Standing Posture and Body Weight Resulting from Upper Extremity Momentum during the Execution of Touchscreen Tasks

Tanimu Deleon¹ and Donald R. Peterson^{2,3}
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TH-80

Correlation of Shank Acceleration Using Wearable IMUs with Peak Vertical Ground Reaction Force in a Jump

Ruchika Tadakala¹, Mirel Ajdaroski¹, and Amanda Esquivel¹
¹University of Michigan–Dearborn, Dearborn, MI

TH-81

Sagittal Plane Dynamic Balance Time Evolution in Transitions of Altered Complexity and Anticipation

Wentao Li¹ and Nicholas Fey^{1,2}
¹The University of Texas at Dallas, Richardson, TX, ²The University of Texas Southwestern Medical Center, Dallas, TX

TH-82

Surgical Skill Assessment Using Convolutional Neural Networks on Time Series Kinematic Data

Marzieh Ershad¹, Robert Rege², and Ann Majewicz Fey³
¹University of Texas at Dallas, Dallas, TX, ²University of Texas Southwestern Medical Center, Dallas, TX, ³University of Texas at Dallas, Dallas, TX

TH-83

Modeling and Simulation of Rowing Exercise

Farbod Rohani¹, Hanz Richter¹, and Antonie van den Bogert¹
¹Cleveland State University, Cleveland, OH

TH-84

Effects of Treadmill Delivered Translational Perturbations Training on Walking Dynamic Stability

Saba Rezvani¹, Seong Moon¹, Rahul Soangra², and Thurmon Lockhart¹
¹Arizona State University, Tempe, AZ, ²Chapman University, Irvine, CA

TH-85

Comparison of Peak Power at Joints in Different Walking Conditions for Young and Old Korean Adults

Fatema Namer¹, Woong Cho², Tae Soo Bae³, and Won Joo¹
¹Robert Morris University, Moon Twp, PA, ²Motion Analysis Korea, Seoul, Korea, Republic of, ³Jungwon University, Daejeon, Korea, Republic of

TH-86

The Gate Pattern Changes Associated with Age and Walking Conditions in Healthy Young and Old Korean Adults

Kylee Schaffer¹, Woong Cho², Tae Soo Bae³, and Won Joo¹
¹Robert Morris University, Moon Twp, PA, ²Motion Analysis Korea, Seoul, Korea, Republic of, ³Jungwon University, Daejeon, Korea, Republic of

TH-87

Effects of Stitching Location on Dynamic Stability

Seong Hyun Moon¹, Rahul Soangra², Chris Frames¹, Saba Rezvani¹, and Thurmon Lockhart¹
¹Arizona State University, Tempe, AZ, ²Chapman University, Irvine, CA

TH-88

Frontal Plane Kinematic Changes with an Increased Degree of Freedom Pedal

Ryan McCulloch¹
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Track: Biomechanics

Biomechanics–Other/Non-specified

TH-89

Experimental Investigation of Fiber Recruitment and Reorientation in Skin under Different Loading Conditions

Nazanin Afsar Kazerooni¹, Arun Srinivasa¹, and John Criscioe¹
¹Texas A&M University, College station, TX

TH-90

Universal Scaling of Human Skin Mechanical Photodamage Across the UV Spectrum

Zachary Lipsky¹ and Guy German¹
¹Binghamton University, Binghamton, NY

TH-91

Determination of Time of Death Using a Two-Dimensional Bioheat Transfer Model

Madeline Carnell¹, Grace McGrath¹, Olivia Rose¹, Garrett Sutton¹, and Saeed Tiari¹
¹Gannon University, Erie, PA

TH-92

A Novel Microfluidic Method to Directly Measure Pressures That Drive Organ Morphogenesis

Wade Stewart¹ and Jason Gleghorn¹
¹University of Delaware, Newark, DE

TH-93

Moist Environments and Ageing Promote Biomechanical Changes in Ex Vivo Human Skin

Niranjana Dhandapani¹, Maria Skold², and Guy German¹
¹Binghamton University, Binghamton, NY, ²Essity, Molndal, Sweden

TH-94

Corneal Endothelial Cell Loss Due to Uniaxial Extension

Manuel Ramirez-Garcia¹, Naveen Mysore¹, and Mark Buckley¹
¹University of Rochester, Rochester, NY

TH-95

Influence of Muscle Decellularization Methods on the Mechanics of Extracellular Matrix

William Reyna^{1,2}, Margaret Hammersley¹, Daniel Ludvig^{1,2}, Ramille Shah¹, and Eric Perreault^{1,2}
¹Northwestern University, Evanston, IL, ²Shirley Ryan AbilityLab, Chicago, IL

TH-96

Improved Approach for Measuring Ocular Compliance in Mice

Elizabeth Boazak¹, Joseph Sherwood², Andrew Feola^{1,3}, Cassandra Chu¹, Rebecca King⁴, Darryl Overby², Eldon Geisert⁴, and C. Ross Ethier¹
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TH-97

Buckling Behavior of Spinal Anesthesia Needles

Tessa Hulburt¹, Jessica Booth², Peter Pan², and Philip Brown¹
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TH-98

The Role of Lens Capsule Remodeling in Age-Related Morphogenesis

Matthew Reilly¹
¹The Ohio State University, Columbus, OH

TH-99

Biomechanical Evaluation and Comparison of the Subsidence of a Novel 3D-Printed Lumbar Interbody Fusion Device versus a Generic Annular Fixation Device

Ali Kiapour¹ and Vijay Goel¹
¹Engineering Center for Orthopaedic Research Excellence, The University of Toledo, Toledo, OH

TH-100

Finite Element Analysis of a Tooth Treated Through Minimally Invasive, Conservative, and Traditional Endodontic Repair Techniques

Clark Meyer¹, Chad Allen², Jose Vargas¹, Eunguk Yoo¹, Ying Liu², and Poorya Jalali²
¹University of Texas at Dallas, Richardson, TX, ²Texas A&M University College of Dentistry, Dallas, TX

Track: Nano and Micro Technologies

Bioinspired/Biomimetic Micro and Nano Devices

TH-101

Analysis of Cytochrome C Oxidase Oxygen Reduction Reaction Dynamics and their use in Fuel Cells

Rudy Torres¹, Rui Yuan¹, Marco Fantin¹, Philip LeDuc¹, Shawn Litster¹, and Krzysztof Matyjaszewski¹
¹Carnegie Mellon University, Pittsburgh, PA

TH-102

Artificial Membrane-less Organelles Reveal Distinct Mechanisms of How Compartmentalization Boosts Biochemical Reactions

Taisuke Kojima¹ and Shuichi Takayama¹
¹Georgia Institute of Technology, Atlanta, GA

TH-103

Pumpless Microfluidic Platform for the Culture of Endothelial Cells Under Unidirectional, Recirculating Flow

Yang Yang^{1,2} and Mandy Esch¹
¹National Institution of Standards and Technology, Gaithersburg, MD, ²University of Maryland, College Park, College Park, MD

TH-104

A Controlled Microenvironment to Evaluate Collective Chemotaxis of Retinal Progenitors from *Drosophila Melanogaster*

Caroline Pena¹, Stephanie Zhang¹, Tadmiri Venkatesh¹, and Maribel Vazquez¹
¹CUNY City College of New York, New York, NY

Track: Biomaterials

Biomaterials for Immunoengineering

TH-109

Isolation of Single Cells Based on their Secretion Using Heterofunctional Particles

Katily Ramirez¹ and Todd Sulchek¹
¹Georgia Institute of Technology, Atlanta, GA

TH-110

Characterization of Soluble, Human Serum Protein Adsorption on Electrospun Polydioxanone Templates

Allison Fetz¹, Cristina Fantaziu¹, and Gary Bowlin¹
¹University of Memphis, Memphis, TN

TH-111

Cell Membrane-Coated PLGA Nanoparticle to Modulate Inflammatory Macrophage Phenotype

Chelsea Kraynak¹ and Laura Suggs¹
¹University of Texas at Austin, Austin, TX

TH-112

Polymer-Peptide Nanoplexes as a Platform for Enhancing Immunogenicity in Neoantigen Cancer Vaccines

Kyle Becker¹, Feng Qiu², Frances Knight¹, Sema Sevimli¹, Jessalyn Baljon¹, Daniel Shae¹, Pavlo Gilchuk³, Sebastian Joyce¹, and John Wilson¹
¹Vanderbilt University, Nashville, TN, ²Sichuan University, Chengdu, China, People's Republic of, ³Vanderbilt University Medical Center, Nashville, TN

TH-113

Injectable Scaffold Inducing Antigen-Specific Tolerance for Autoimmune Disease Treatment

Peter Li¹, Frank Bearoff¹, Elizabeth Blankenhorn¹, and Hao Cheng¹
¹Drexel University, Philadelphia, PA

TH-114

Multifactorial Design of Anti-Cytokine Active Immunotherapies

Lucas Shores¹, Cassie Ingram¹, and Joel Collier¹
¹Duke University, Durham, NC

TH-115

Functionalized PEG-4MAL Hydrogels for Delivery of Tolerized Dendritic Cells

Nicholas Beskid¹, Andrés J. García¹, and Julie Babensee¹
¹Georgia Institute of Technology, Atlanta, GA

TH-116

Antidepressant Treatment Alters Macrophage Response to Titanium Surfaces

Arth Shah¹, Kelly Hotchkiss¹, and Rene Olivares-Navarrete¹
¹Virginia Commonwealth University, Richmond, VA

TH-117

Biomimetic Tolerogenic Artificial Antigen Presenting Cells for Regulatory T Cell Induction

Kelly Rhodes¹, Randall Meyer¹, Stephany Tzeng¹, and Jordan Green¹
¹Johns Hopkins University, Baltimore, MD

Thursday, October 18 | 9:30 am–5:00 pm | GWCC Exhibit Hall

Poster Viewing with Authors & Refreshment Break | 9:30 am–10:15 am and 3:00 pm–3:45 pm

TH-118

Engineered Multi-functional Molecule to Functionalize Immune Cells for Circulatory Tumor Cell TargetingZhenjiang Zhang¹ and Michael King¹
¹Vanderbilt University, Nashville, TN

TH-119

CD200-coated PLGA Nanoparticles Inhibit Macrophage EndocytosisEsther Chen¹ and Wendy Liu¹
¹UC Irvine, Irvine, CA

TH-120

Injectable Dual Materials-Based Vaccine Induces Antigen Specific Immune Response to Cure CancerThanh Loc Nguyen¹, BongGeun Cha¹, Minh Hoang Nguyen¹, YoungJin Choi¹, and Jaeyun Kim^{1,2,3}
¹Sungkyunkwan University, Suwon, Korea, Republic of, ²Samsung Advanced Institute for Health Sciences and Technology (SAIHST), Suwon, Korea, Republic of, ³Biomedical Institute for Convergence at SKKU, Suwon, Korea, Republic of

TH-121

Heterochiral Self-Assembling PeptidesTara Clover¹ and Jai Rudra¹
¹University of Texas Medical Branch, Galveston, TX

TH-122

Engineering Immunomodulatory Adhesives for the Treatment of Chronic WoundsBahram Saleh¹, Harkiranpreet Dhaliwal¹, Roberto Portillo-Lara^{1,2}, Ehsan Shirzaei Sani¹, Mansoor Amiji¹, and Nasim Annabi¹
¹Northeastern University, Boston, MA, ²tecnologico de monterrey, Monterrey, Mexico

TH-123

Wnt Signaling Regulates Macrophage Activation in Response to Biomaterial Surface PropertiesJefferson Overlin¹, Kelly Hotchkiss¹, Manotri Chaulal¹, and Rene Olivares-Navarrete¹
¹Virginia Commonwealth University, Richmond, VA**Track: Biomaterials****Hydrogel Biomaterials**

TH-124

Temperature Responsive 3D Porous Hydrogel Scaffold for Ex Vivo Cell CultureJun-Goo Kwak¹, Ryan Carpenter², Seong Yeon Song¹, Yumi Kim¹, and Jungwoo Lee¹
¹University of Massachusetts, Amherst, MA, ²University of Massachusetts Am, Amherst, MA

TH-125

Zinc-absorbing Contact Lens for Corneal MeltingSelina Vong¹, Shiwha Park², Jung Jae Lee¹, and Kyung Jae Jeong²
¹University of Colorado Denver, Denver, CO, ²University New Hampshire, Durham, NH

TH-126

Self-assembling Nucleo-peptides as a Platform for Biologically Active HydrogelsKiheon Baek¹ and Laura Suggs¹
¹The University of Texas at Austin, Austin, TX

TH-127

Collagen Partition in Polymeric Aqueous Two-Phase Systems for Tissue EngineeringSunil Singh¹ and Hossein Tavana¹
¹University of Akron, Akron, OH

TH-128

Evaluation of Different Detergents for the Generation of a Pancreas-Derived Hydrogel Matrix.Roberto Gaetani¹, Taylor Martin¹, Lea Lara Der Maddalena¹, Soraya Aude¹, Monika Dzieciatkowska², Kirk Hansen², and Karen Christman¹
¹UCSD, La Jolla, CA, ²University of Colorado, Aurora, Aurora, CO

TH-129

Enzymatic Generation of a Plasmid DNA Hydrogel for Cell Free Protein SynthesisYehudah Pardo¹, Kenneth Yancey¹, Shogo Hamada¹, David Bassen¹, Minglin Ma¹, and Dan Luo¹
¹Cornell University, Ithaca, NY

TH-130

Rheological Evaluation of Chitosan Based Hydrogels Containing Silica/Calcium Phosphate ParticlesSeyed Mohsen Latifi¹, Ushna KB Arora¹, Ravi Om Shankar¹, Shani Lea Levit¹, Christina Tang¹, and Henry J Donahue¹
¹Virginia Commonwealth University, Richmond, VA

TH-131

Bioinspired Molecular Self-Assembly of Complex Three-Dimensional Structures in Soft MaterialsChangjin Huang¹, David Quinn¹, Subra Suresh², and Jimmy Hsia¹
¹Carnegie Mellon University, Pittsburgh, PA, ²Nanyang Technological University, Singapore, Singapore

TH-132

Design of Biocompatible Crosslinkers for Tuning Hydrolytic Degradation of PEG HydrogelsStephanie Kroger¹, Lindsay Hill¹, Aaron Stock¹, Era Jain¹, and Silviya Zustiak¹
¹Saint Louis University, St. Louis, MO

TH-133

Elastin-like Protein (ELP) Temperature Transition Affects PEG-ELP Double-network Hydrogel PropertiesEdi Mecco¹ and Kyle Lampe¹
¹University of Virginia, Charlottesville, VA

TH-134

Cell-laden Elastomeric Silk Fibers for Skeletal Muscle Tissue EngineeringSarah Bradner¹ and David Kaplan¹
¹Tufts University, Medford, MA

TH-135

Self-assembled Antibacterial Peptide Nanofibers Inspired by LL-37Biplab Sarkar¹, Peter Nguyen¹, Shivani Jaisinghani¹, Reshma Paul¹, Zain Siddiqui¹, Michael McGowan¹, Patricia Iglesias-Montoro¹, and Vivek Kumar¹
¹New Jersey Institute of Technology, Newark, NJ

TH-136

Physically Crosslinked DNA-Based Injectable Hydrogels for Bone Regeneration

Sayantani Basu¹, Settimio Pacelli¹, and Arghya Paul¹
¹University of Kansas, Lawrence, KS

TH-137

Whispering Gallery Mode Resonator Sensor for In Situ Measurements of Hydrogel Gelation

Saahil Sheth¹, Steven Huang², Era Jain^{1,2}, Xuefeng Jiang², Lan Yang², and Silviya Zustiak¹
¹Saint Louis University, St Louis, MO, ²Washington University in St Louis, St Louis, MO

TH-138

Storage Stability of Biodegradable Polyethylene Glycol Microspheres

Saahil Sheth¹, Era Jain^{1,2}, Kristen Polito¹, Scott Sell¹, and Silviya Zustiak¹
¹Saint Louis University, St Louis, MO, ²Washington University in St Louis, St Louis, MO

TH-139

In-Vitro Engineered Auricular Cartilage: Maximizing Interfacial Contact with 3D-Printed External Scaffolds Significantly Diminishes Cell-Mediated Construct Contraction

Arash Samadi¹, Alexandra J. Lin¹, Matthew A. Wright¹, Jaime L. Bernstein¹, Daniel O. Lara¹, Justin S. Buro¹, Karel-Bart Celie¹, Yoshiko Toyoda¹, and Jason A. Spector^{1,2}
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TH-140

Comparison of Thiol-Ene and Tetrazine Click Crosslinked PEG-Peptide Hydrogels for Tissue Engineering

Amanda Rakoski¹, Samantha Holt¹, Faraz Jivan¹, and Daniel Alge¹
¹Texas A&M University, College Station, TX

TH-141

In Vitro Neurovascular Model and Particulate Characterization of Liquid Embolics

Christopher Settanni¹, Trevor Cotter¹, Kevin Logrande¹, Mohammad Almutairi¹, Saleh Aldhufairi¹, and Timothy Becker¹
¹Northern Arizona University, Flagstaff, AZ

TH-142

Biocompatible and Spreadable Bio-Adhesive for Bone Union Formation in Comminute Fracture Treatment

Jose German Vargas Villanueva¹, Julian Andres Serna Mendez¹, Paula Andrea Sarmiento Huertas¹, Juan Carlos Cruz Jimenez¹, Carolina Muñoz Camargo¹, Felipe Salcedo Galan¹, Juan Pablo Casas Rodriguez¹, and Juan Carlos Briceño Triana¹
¹Universidad de los Andes, Bogota, Colombia

TH-143

Micromolded Gelatin Hydrogels Crosslinked with Laminin for Disease On A Chip Applications

Rachel Besser¹, Isabella Claire¹, Ellery Jones¹, Joe Reda¹, and Ashutosh Agarwal¹
¹University of Miami, Miami, FL

TH-144

A Simple Microfluidic Device for Production of Monodisperse Hydrogel Microspheres

Kyle Vogt¹, Moshdeh Imaninezhad¹, Dzhuliya Vasileva¹, Silviya Zustiak¹, and Mark McQuilling¹
¹Saint Louis University, Saint Louis, MO

TH-145

A Factorial Analysis to Determine the Effects of Brittle Network Variables on Double Network Properties

Alexander Struck Jannini¹, Justin Sheplock¹, James Henderson¹, and Julie Hasenwinkel¹
¹Syracuse University, Syracuse, NY

TH-146

Local Delivery of Myd88 Using an Injectable Polyester-Based Hydrogel to Treat Myocardial Infarction

Yunghao Tsou¹ and Xiaoyang Xu¹
¹New Jersey Institute of Technology, Newark, NJ

TH-147

Effect of Alginate Matrix Engineered to Mimic the Pancreatic Microenvironment on Encapsulated Islet Function

Kevin Enck¹, Alec Jost², and Emmanuel Opara¹
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TH-148

Has Your Biocompatible Surface Changed? Reactive Ion Plasma Introduces Unstable Functional Groups onto the Surface of poly (Vinyl Alcohol)

Patrick Journey¹, Deirdre Anderson¹, Grace Pohan², Evelyn Yim², and Monica Hinds¹
¹Oregon Health & Science University, Portland, OR, ²University of Waterloo, Waterloo, ON, Canada

TH-149

Nucleus Pulposus Cell Morphology is Controlled by Substrate Stiffness and Adhesive Ligand Density

Marcos Barcellona¹, Bailey Fearing¹, Liufang Jing¹, Michael Talcott², Munish Gupta², Michael Kelly², Lukas Zebala², Jacob Buchowski², and Lori Setton¹
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TH-150

Effect of Ionic Strength on Shear-thinning Nanoclay-polymer Composite Hydrogels

Amir Sheikhi¹, Samson Afewerki², Rahmi Oklu³, Akhilesh K. Gaharwar⁴, and Ali Khademhosseini¹
¹University of California-Los Angeles (UCLA), LA, CA, ²Massachusetts Institute of Technology, Boston, MA, ³Mayo Clinic, Scottsdale, AZ, ⁴Texas A&M University, College Station, TX

TH-151

Mechanical Differences in Degradable Hydrogels via Preparation Conditions

Alexander Chen¹ and David Puleo¹
¹University of Kentucky, Lexington, KY

TH-152

Photocrosslinking of Methacrylated Collagen Hydrogels: Effect of I-2959 vs. VA-086 on Mechanics and Cellular Response

Kori Watkins¹, Thuy-Uyen Nguyen¹, and Vipul Kishore¹
¹Florida Institute of Technology, Melbourne, FL

TH-153

Engineered Synthetic Biomaterials for Vascularized 3D In Vitro Models

Alexander Brown¹, Timothy Kassis¹, Hongkun He², Paula Hammond², and Linda Griffith^{1,3}
¹Department of Biological Engineering, Massachusetts Institute of Technology, Cambridge, MA, ²Department of Chemical Engineering, Massachusetts Institute of Technology, Cambridge, MA, ³Center for Gynecopathology Research, MIT, Cambridge, MA

TH-154

Develop Hydrogel ECM with Multiple Spatial Inhomogeneities

Minji Whang¹, Hyeonji Yu¹, and Jungwook Kim¹
¹Sogang University, Seoul, Korea, Republic of

Track: Biomaterials

Biomaterials-Other/Non-specified

TH-155

Long-term Deep Supercooling of Large-volume Water Via Surface Sealing With Immiscible Liquids

Haishui Huang¹, O. Berk Usta¹, and Martin L. Yarmush¹
¹Massachusetts General Hospital, Boston, MA

TH-156

Influence of Polymer Properties on Lens Epithelial Cell Response

Katelyn Swindle-Reilly¹, Mallory Allen¹, Ryan Prieto¹, Sophie Carus¹, and Heather Chandler¹
¹The Ohio State University, Columbus, OH

TH-157

Nitric Oxide Generating Surface for Antibacterial Purpose in Artificial Lungs

Angela Lai¹, Neha Kapate¹, Neil M. Carleton¹, and Keith E. Cook¹
¹Carnegie Mellon University, Pittsburgh, PA

TH-158

Effects of X-ray Irradiation on Properties of PTFE

Ryu Thenuwara¹, Farah Rahhal¹, Angelica Polo¹, and Guna Selvaduray¹
¹San Jose State University, San Jose, CA

TH-159

Fabrication of Concussion Resistant Nanocomposites

Prabir Patra¹, Tong Zuo², Kuangyu Shen¹, Xiaoliang Li¹, Samora Peter³, ChandraSekhar Tiwary³, Pulickel Ajayan³, and Isaac Macwan¹
¹University of Bridgeport, Bridgeport, CT, ²University of Bridgeport, Bridgeport, CT, ³Rice university, Houston, TX

TH-160

Selectin-targeting Glycocalyx Mimetic as a Treatment for Endothelial Cell Dysfunction

Tima Dehghani¹, James Wodicka^{1,2}, and Alyssa Panitch¹
¹University of California, Davis, Davis, CA, ²Purdue University, West Lafayette, IN

TH-161

Protein Resistance of PEO-silane Amphiphiles: Impact of Structural Features and Concentration

Bryan Khai Ngo¹, Kendrick Lim¹, Shane Staflieni², and Melissa Grunlan¹
¹Texas A&M University, College Station, TX, ²North Dakota State University, Fargo, ND

TH-162

Blood Plasma Protein Interaction with Superhydrophobic Titania Nanotube Surfaces

Roberta Maia Sabino¹, Kirsten Kauk¹, Sanli Movafaghi¹, and Ketul Popat¹
¹Colorado State University, Fort Collins, CO

TH-163

Substrate Viscosity Dictates Cellular Response

Thomas Petet, Jr¹, Halston Deal¹, Arianna DeCastro¹, Christina Tang¹, Seth Weinberg¹, and Christopher Lemmon¹
¹Virginia Commonwealth University, Richmond, VA

TH-164

Comparison Study of Mechanically Assisted Electrochemical Behavior of Alumina-TiC with Medical Grade Metal/Metal Alloys in Biological Environment

Hetal Maharaja¹ and Guigen Zhang²
¹Clemson University, Clemson, SC, ²University of Kentucky, Lexington, KY

TH-165

Electrospun Cold Water Fish Gelatin Nanofibrous Hydrogels for Skin Repair

Anna Krum¹, Amanda Kennell¹, and Andrei Stanishevsky¹
¹University of Alabama at Birmingham, Birmingham, AL

TH-166

Artificial Human Bladder Prototyping

Ravyn Ogden¹, Anna Deng¹, Dkieleh Cole-Cash¹, Courtney Mason¹, and Jeffrey LaBelle¹
¹Arizona State University, Tempe, AZ

TH-167

Electrospun Matrices for Neural Tissue Engineering Applications

Bradley Snow¹, Tyler Masden¹, and Janin McKenzie¹
¹Walla Walla University, College Place, WA

Track: Device Technologies and Biomedical Robotics

Biosensors

TH-168

All-Electronic Microfluidic Cell Analyzer for High-Throughput Mechanophenotyping

North Asmare¹, A K M Arifuzzman¹, and Ali Fatih Sarioglu¹
¹Georgia Institute of Technology, Atlanta, GA

TH-169

Longer Gold Nanorods Produce an Improved Quality Vertical Array for Biosensing Applications

Sharon Kwee¹ and Liang Tang¹
¹The University of Texas at San Antonio, San Antonio, TX

TH-170

Aptamer-based Nanovolume Chemical Warfare Agent Detection Assays in Urine and Serum Using Interferometry

Michael Kammer¹, Amanda Kussrow¹, George Jackson², Frederick Haselton¹, and Darryl Bornhop¹

¹Vanderbilt University, Nashville, TN, ²Base Pair Biotechnologies, Pearland, TX

TH-171

Quantifying Na⁺ and K⁺ Ions in Urine Using Miniaturized Paper-based Microfluidic Device

Fariba Ghaderinezhad¹ and Savas Tasoglu¹

¹University of Connecticut, Storrs, CT

TH-172

Stability Enhanced 3D Porous Gold-foamed Electrode Capable of Detecting C-reactive Protein(CRP) Antigen

Yugyung Jung¹, Minkook Son¹, and Sung Yang¹

¹Gwangju Institute of Science and Technology, Gwangju, Korea, Republic of

TH-173

Novel Electrocardiogram (ECG) Acquisition and Analysis in Awake Zebrafish

Tai Le¹, Isaac Clark², Ishaan Bhimani², Joseph Fortunato¹, Paul Marsh¹, and Hung Cao^{1,2}

¹University of Washington, Bothell, WA, ²University of Washington, Seattle, WA

TH-174

Wireless Flexible and Highly-Sensitive Iridium Oxide-based pH Sensors

Paul Marsh¹, Miguel Huerta¹, Tai Le¹, and Hung Cao^{1,2}

¹University of Washington, Bothell, WA, ²University of Washington, Seattle, WA

TH-175

Non-invasive Venous Waveform Analysis (NIVA) to Detect Rate of Hemorrhage in a Porcine Model

Kyle Hocking¹, Susan Eagle¹, Andrew Spies¹, Timothy Nunez¹, and Colleen Brophy¹

¹Vanderbilt University Medical Center, Nashville, TN

TH-176

Experimental Demonstration of an Improved Optical Cavity-based Biosensor Through Biotinylated BSA Detection

Donggee Rho¹ and Seunghyun Kim¹

¹Baylor University, Waco, TX

TH-177

Surface Enhanced Raman Spectroscopy for the Detection of B-type Natriuretic Peptide

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TH-178

Ultra-sensitive Detection of Pro-Inflammatory Cytokines for Early Detection of Infection

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TH-179

Protein Characterization Using Surface Acoustic Wave (SAW) Nanoliter Viscosity Sensors Modeling and Simulation with COMSOL

Vishal Dhagat¹, Faquir Jain¹, and Pierre Dufillie²

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TH-180

A Rapid Biosensor for Water Testing Utilizing Surface Coated Lectins for Specific Bacterial Binding

Aniqa Chowdhury¹, Tyler McKeown¹, Joshua Cheser¹, and Delphine Dean¹

¹Clemson University, Clemson, SC

TH-181

Electrical Profiling of Cell Surface Expression via Magnetophoresis and Microfluidic CODES

Ozgun Civelekoglu¹, Mert Boya¹, and Ali Fatih Sarioglu¹

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TH-182

Enhancement of the Lateral-Flow Immunoassay Utilizing Ionic Liquid Aqueous Two-Phase Systems

Matthew Yee¹, Grace Emmel¹, Eric Yang¹, Eumene Lee¹, Justin Paek¹, Benjamin Wu^{1,2}, and Daniel Kamei¹

¹UCLA, Los Angeles, CA, ²UCLA School of Dentistry, Los Angeles, CA

TH-183

Non-Invasive Bio-Impedance Monitor and Ultrasonic Reflection Monitor for Fast Measurement of Hydration Status and Edema

Fred Dyer¹ and Jaspal Attrey¹

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TH-184

A Rapid Biosensor for Water Testing Utilizing Surface Coated Lectins for Specific Bacterial Binding

Aniqa Chowdhury¹, Jacqueline Rohde¹, Tyler McKeown¹, Joshua Cheser¹, and Delphine Dean¹

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TH-185

Handheld GMO Biosensor

Hunter Stevenson¹, David Kinnamon¹, Jordan Pin¹, Amanda Bacon¹, Priya Chary¹, Vinay Nagaraj², and Shalini Prasad¹

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TH-186

Electrospinning PDMS Fibers: A Material Substrate for Flexible and Stretchable Electronics

Matthew Brown¹ and Ahyeon Koh¹

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TH-187

Multiplexed Quantification of Proteins Based On The Electrical Differential Counting Technology

Enrique Valera¹, Jacob Berger¹, Umer Hassan¹, Daniel Abboud¹, Zeeshan Haidry¹, Andrew Larson¹, Nathaniel Leung¹, Noshin Nawar¹, Victor Font-Bartumeus¹, Carlos García¹, Justin Tiao¹, Victoria Kindratenko¹, and Rashid Bashir¹

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TH-188

Detection of Sjogren's Syndrome Biomarkers in Human Tears using Polymer Modified Gold Nanoshells

Marissa Wechsler¹, Heidi Culver¹, and Nicholas Peppas¹
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TH-189

A V-Groove Resonator to Distinguish Different Types of Liquids in Bottles

Lei Mashimo¹, Souvik Dubey¹, and J-C Chiao¹
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TH-190

Patient Driven Diagnostic Tool for Early Breast Cancer Detection: Electrochemical Biosensor

Sara Alharathi¹, Divya Bijukumar¹, Nirmala Nag¹, Shalini Prasad², Ajaz Khan³, and Mathew Mathew¹
¹UIC College of Medicine at Rockford, Rockford, IL, ²University of Texas at Dallas, Dallas, TX, ³OSF hospital, Rockford, IL

Track: Device Technologies and Biomedical Robotics

Design and Control of Prostheses and Exoskeletons

TH-191

A Modular Transradial Bypass Socket for Surface Electromyographic Prosthetic Control in Non-Amputees

Michael Paskett¹, Nathan Olsen¹, Jacob George¹, David Kluger¹, Mark Brinton¹, Tyler Davis¹, Christopher Duncan¹, and Gregory Clark¹
¹University of Utah, Salt Lake City, UT

TH-192

Development of a 3D-printed, Lightweight, Inexpensive, and Adaptable Prosthetic Wrist

Nathaniel Olsen¹, Jacob George¹, David Kluger¹, Michael Paskett¹, Christopher Duncan¹, and Gregory Clark¹
¹University of Utah, Salt Lake City, UT

TH-193

New Low-Cost Proximity Sensors for Patient Interactions

David McLeod¹, Alex Garver¹, Kevin Barker¹, Amelia Godolphin¹, Abigail Keating¹, Matt Brown¹, Kacie O'Neill¹, and Melissa McCullough¹
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Track: Device Technologies and Biomedical Robotics, Translational Biomedical Engineering

Implantable and Wearable Sensors

TH-194

Controlled Release of Amino Acids for Enhancement of Islet Viability in Encapsulation and Transplantation

Gauree Chendke¹, Gaetano Faleo¹, Charity Juang¹, Matthias Hebrok¹, Qizhi Tang¹, and Tejal Desai¹
¹University of California San Francisco, San Francisco, CA

TH-195

Improved Surface Coating for Continuous Glucose Monitor Biocompatibility and Function

Joshua Doloff^{1,2}, Shady Farah^{1,2}, Atieh Sadraei¹, Xi Xie¹, Volkan Yesilyurt^{1,2}, James McGarrigle³, Jose Oberholzer³, Robert Langer¹, and Daniel Anderson¹
¹David H. Koch Institute for Integrative Cancer Research and Dept. of Chemical Engineering, Massachusetts Institute of Technology, Cambridge, MA, ²Department of Anesthesiology, Boston Children's Hospital, Boston, MA, ³University of Illinois at Chicago, Chicago, IL

TH-196

Progress on a Flexible pH Sensor for Skin pH Tests

Xuesong Yang¹, Khengdauliu Chawang¹, and J-C Chiao¹
¹University of Texas at Arlington, Arlington, TX

TH-197

A Continuous Sensing Platform for Quantification of Proteomic Breast Cancer Biomarkers

Mackenzie M. Honikel¹ and Jeffrey T. La Belle¹
¹Arizona State University, Tempe, AZ

TH-198

Effects of Mechanical Bending on a Flexible Implantable Antenna for Wireless Power Transfer

Lei Mashimo¹, Souvik Dubey¹, and J-C Chiao¹
¹University of Texas at Arlington, Arlington, TX

TH-199

Integration of Sensing Microparticles in a Microporous Annealed Particle (MAP) Scaffold Towards Achieving a Long-term, Implantable Biosensor

Victoria Baldock¹, Joe de Rutte², Dino Di Carlo², and Michael McShane¹
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TH-200

Thermoresponsive Hydrogels for "Self-Cleaning" Glucose Biosensor Membranes

Courtney Shrode¹, Ping Dong¹, Kristen Means¹, Bradley Schott¹, Andrea Locke¹, Gerard Coté¹, and Melissa Grunlan¹
¹Texas A&M University, College Station, TX

Track: Device Technologies and Biomedical Robotics

Implantable Devices and Implantable Electronics

TH-201

Design of a Shape Memory Polymer Embolization Device for the Treatment of Intracranial Aneurysms

Robert Kunkel¹, Devin Laurence¹, Jingyu Wang¹, Yingtao Liu¹, Bradley Bohnstedt², and Chung-Hao Lee¹
¹University of Oklahoma, Norman, OK, ²University of Oklahoma Health Sciences Center, Oklahoma City, OK

TH-202

A Novel High-fidelity Murine Model to Study the Effects of External Beam Irradiation after Device-based Breast Reconstruction

Matthew A. Wright¹, Arash Samadi¹, Alexandra J. Lin¹, Sarah J. Karinja¹, Daniel O. Lara¹, Justin Buro¹, Karel-Bart Celie¹, James Russell², and Jason Spector^{1,3}

¹Laboratory of Bioregenerative Medicine & Surgery, Weill Cornell Medical College, Department of Surgery, Division of Plastic Surgery, Cornell University, New York, NY, ²Department of Medical Physics, MSKCC, New York, NY, ³Meinig School of Biomedical Engineering, Cornell University, Ithaca, NY

TH-203

Evaluation of Magnetic Field Generated from Body-size Excitation Coil for Hyperthermia and Implantable Medical Devices

Tomohiro Aoto¹, Tsutomu Yamada¹, and Yasushi Takemura¹

¹Yokohama National University, Yokohama, Japan

TH-204

Performance Evaluation of Inferior Vena Cava Filters: A Computational Approach

Felipe Souza¹, Kaija Ranglin¹, Michael Christie², and Manuel Salinas¹

¹Nova Southeastern University, Fort Lauderdale, FL

²Florida International University, Miami, FL

TH-205

Aramid Nanofiber Composite Separators for Flexible Metal Sulfur Thin Film Batteries

Ahmet Emre¹ and Nicholas Kotov¹

¹University of Michigan, Ann Arbor, MI

Track: Cardiovascular Engineering

Cardiac Electrophysiology

TH-206

Critical Mass of Human Myocardium Necessary for Ventricular Fibrillation

Kedar Aras¹, Brianna Cathey¹, Nde Rokhaya Faye¹, and Igor Efimov¹

¹George Washington University, Washington, DC

TH-207

Re-entrant Excitation Initiated from a Single Stimulus Site in a Computer Model of a Sheet of Cardiac Cells.

Roger Barr¹ and Patrick Wolf¹

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TH-208

RNA Powered Expression of TBX18 Drives Conversion Of Cardiomyocytes to De Novo Biological Pacemakers

David Wolfson¹, Michael Sayegh¹, Jinmo Gu¹, Nam Kim¹, Natasha Fernandez¹, Hee Cheol Cho¹, Jared Beyersdorff², and Philip Santangelo²

¹Emory University, Atlanta, GA, ²Georgia Institute of Technology, Atlanta, GA

TH-209

Improved Accuracy Using Mixed Reality Visualization and Interaction During Transcatheter Ablation Procedures

Jennifer Silva¹, Michael Southworth², Aarti Dalal¹, George VanHare¹, and Jonathan Silva³

¹Washington University SOM, Saint Louis, MO, ²SentiAR, Saint Louis, MO, ³Washington University SEAS, Saint Louis, MO

TH-210

Open-Source Multiparametric Optocardiography

Sofian Obaid¹, Brianna Cathey¹, Alexander Zolotarev², Roman Prymonosov², Roman Syunyaev², Sharon George¹, and Igor Efimov¹

¹The George Washington University, Washington, DC, ²Moscow Institute of Physics and Technology, Moscow, Russian Federation

TH-211

Catheter-Based Ablation System for the Left Atrial Appendage

Ashley K. Rook¹, Elaine B. Chinn¹, Charlene A. Morrison¹, Ryan C. Oatman¹, Blake A. Smith¹, Anand V. Ganapathy^{2,3}, Mathews M. John², and Mehdi Razavi^{2,3}

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Track: Cardiovascular Engineering, Bioinformatics, Computational and Systems Biology

Computational Modeling in Cardiovascular Systems

TH-212

Altered Fluid Mechanical Forces in Tetralogy of Fallot Obtained from Patient Specific Ultrasound Image based Computational Fluid Dynamics

Hadi Wiputra¹, Elias Talbi¹, Guat Ling Lim², Sanah Merchant Soomar², David Bark³, Hwa Liang Leo¹, Arijit Biswas²,

Citra Nurfarah Zaini Mattar², and Choon Hwai Yap¹

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TH-213

The Effect of Free-breathing on Decision Making in Image-based Fontan Surgical Planning

Zhenglun Wei¹, Phillip Trusty¹, Yingnan Zhang¹, Elaine Tang¹, Kevin Whitehead², Mark Fogel², and Ajit Yoganathan¹

¹Georgia Institute of Technology, Atlanta, GA, ²Children's Hospital of Philadelphia, Philadelphia, PA

TH-214

Characterization of Fluid Mechanics of the Zebrafish Embryonic Heart in a 4D CFD Model

Yoke Yin Foo¹, Shilpa Pant¹, Shermaine Tay¹, Nurgul Imangali¹, Nanguang Chen¹, Christoph Winkler¹, and Choon Hwai Yap¹

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TH-215

Development of a Novel Algorithm for Identifying the Leading Pacemaker in Isolated Atrial Preparations for Optical Mapping Studies

Jaclyn Brennan¹ and Igor Efimov¹

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TH-216

POD and DMD Based Model Order Reduction for Cardiac Monodomain Simulation

Riasat Khan¹ and Kwong Ng¹

¹New Mexico State University, Las Cruces, NM

Thursday, October 18 | 9:30 am–5:00 pm | GWCC Exhibit Hall

Poster Viewing with Authors & Refreshment Break | 9:30 am–10:15 am and 3:00 pm–3:45 pm

TH-217

Model Order Reduction of Finite Difference Bidomain Modeling of Cardiac PropagationRiasat Khan¹ and Kwong Ng¹
¹New Mexico State University, Las Cruces, NM

TH-218

Bidomain Cardiac Propagation Modeling with the Element Free Galerkin MethodIan Sturdevant¹ and Kwong Ng¹
¹New Mexico State University, Las Cruces, NM

TH-219

Fluid-structure-interaction Model in Parallel Hemodynamics ApplicationIsmael Perez¹, John Gounley¹, and Amanda Randles¹
¹Duke University, Durham, NC

TH-220

Fluid Structure Interaction Analysis of a Patient-Specific Multiscale LVAD Flow Model Under Pulsatile ConditionsRay Prather¹, Alain Kassab¹, Eduardo Divo², and William Decamp³
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TH-221

Modeling Oscillatory Flow in a Cone-and-Plate Device Using Computational Fluid DynamicsEmad Ramadan¹ and Matthias U. Nollert¹
¹University of Oklahoma, Norman, OK

TH-222

Modeling Fluid Flow in Coronary Artery AnomaliesSimbarashe Chidyagwai¹, Amanda Randles¹, Reid Chamberlain², and Piers Barker²
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TH-223

Y-graft Modification to the Fontan Procedure: Improving Results over TimePhillip Trusty¹, Zhenglun Wei¹, Megan Sales¹, Kirk Kanter^{2,3}, Mark Fogel⁴, Ajit Yoganathan¹, and Timothy Slesnick³
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TH-224

Microvascular Bifurcation Ratios and ThrombosisHari Hara Sudhan Lakshmanan¹, Joseph Shatzel¹, Owen McCarty¹, and Jeevan Maddala²
¹Oregon Health and Science University, Portland, OR, ²West Virginia University, Morgantown, WV

TH-225

Design of a Double Tier IVC Filter Using Finite Element AnalysisRichie Ramdhanie¹, Connor Watson¹, Jimmy George¹, Manasvi Varshney¹, Ashley Domingo¹, Alyssa Thomas Decruz¹, Chaudhry Hassan¹, and Yi-Xian Qin¹
¹Stony Brook University, Stony Brook, NY

TH-226

Machine Learning to Enable Fast Patient-specific Biomechanical AnalysisLiang Liang¹, Minliang Liu¹, wenbin Mao¹, and Wei Sun¹
¹Georgia Institute of Technology, Atlanta, GA

TH-227

Computational Modeling of Lymphatic Valve Dynamic FunctionKi Wolf¹, Matthew Ballard², Zhanna Nepyushchikh¹, Brandon Dixon¹, and Alexander Alexeev¹
¹Georgia Institute of Technology, Atlanta, GA, ²Saint Martin's University, Lacey, WA

TH-228

3D Patient-Specific Hemodynamics Derived From 2D Angiography in Hypoplastic Left Heart Syndrome Following the Norwood ProcedureMichael Kaplan¹, Piers Barker^{1,2}, Kevin Hill^{1,2}, James Chen³, Reid Chamberlain^{1,2}, John Gounley¹, Madhurima Vardhan¹, and Amanda Randles¹
¹Duke University, Durham, NC, ²Duke University Health System, Durham, NC, ³University of Colorado, Aurora, CO**Track: Cardiovascular Engineering, Tissue Engineering****Cardiovascular Tissue Engineering**

TH-229

Thrombotic Remodeling Drives Early Luminal Neotissue Formation in Tissue Engineered Vascular GraftsJames Reinhardt¹, Juan de Dios Ruiz Rosado¹, Yong-Ung Lee¹, Tai Yi¹, Qiang Zeng¹, Santiago Partida-Sanchez¹, Toshiharu Shinoka¹, and Christopher Breuer¹
¹Nationwide Children's Hospital, Columbus, OH

TH-230

Self-assembled Collagen-Fibrin Hydrogel Reinforces Tissue Engineered Adventitia Vessels Seeded with Human FibroblastsBijal Patel¹, Zhengfan Xu¹, Cameron Pinnock¹, Loay Kabbani², and Mai Lam¹
¹Wayne State University, Detroit, MI, ²Henry Ford Health System, Detroit, MI

TH-231

Direct-write Biopolymer Micro-fiber Fabrication for Microvessel FormationXiaoming Fan¹, Soucy Patricia¹, Kunal Kate¹, Stuart Williams¹, and Robert Keynton¹
¹University of Louisville, Louisville, KY

TH-232

Thin Decellularized Cardiac Slice as Cardiac Patch to Repair Infarcted Rat MyocardiumMickey Shah¹, Pawan KC¹, and Ge Zhang¹
¹The University of Akron, Akron, OH

TH-233

Engineering Cardiac Tissue Mimics as *In Vitro* Test Beds to Investigate Congenital Heart DiseaseDeanna Bousalis¹, Christopher Lacko¹, Rebecca Wachs², Sahba Mobini¹, Hideko Kasahara¹, and Christine Schmidt¹
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TH-234

Diabetes Resistant Tissue Engineered Vascular Grafts

Jhilmil Dhulekar¹, Zoltan Hajdu², Dan Simionescu², and Agneta Simionescu²
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TH-235

Effects of Isoproterenol and d,l-Sotalol on Contractility in the I-Wire Human Cardiac Tissue Construct

Veniamin Sidorov¹, Philip Samson¹, Tatiana Sidorova², and John Wikswo¹
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TH-236

Ultrasonic Characterization of the Extracellular Matrix in Cardiac Tissue

Abigail Tubbs¹, Stephanie Zaferiou¹, Chaeun Lim¹, Raymond Toncich¹, Nicholas Merna², and Sleiman R. Ghorayeb^{1,3,4}
¹Ultrasound Research Lab, DeMatteis School of Engineering and Applied Sciences, Hofstra University, Hempstead, NY, ²Cell and Tissue Engineering Lab, DeMatteis School of Engineering and Applied Sciences, Hofstra University, Hempstead, NY, ³Radiology and Molecular Medicine, Zucker School of Medicine at Hofstra/Northwell, Hempstead, NY, ⁴Feinstein Institute for Medical Research, Manhasset, NY

TH-237

Novel Trileaflet Mechanical Valve Hemodynamics and Turbulent Stresses

Michael Mastran¹, Hoda Hatoum¹, and Lakshmi Dasi¹
¹The Ohio State University, Columbus, OH

TH-238

Assessment of Cardiovascular Risk during Spaceflight using 3D Bioprinted Tissues

Likitha Somasekhar¹, Kenia Nunes¹, Kishen Mitra², Srujana Neelam³, Ye Zhang³, and Kunal Mitra¹
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TH-239

Cultured Aged Rat Mesenteric Microvascular Networks Are Capable of Undergoing “Adult-Like” Angiogenesis in Response to Growth Factor Stimulation

Nicholas Hodges¹ and Walter L. Murfee²
¹Tulane University, New Orleans, LA, ²University of Florida, Gainesville, FL

TH-240

In-body Tissue Engineering of Trilayered Structure of a Heart Valve Leaflet

Soumen Jana¹, Federico Franchie¹, and Amir Lerman¹
¹Mayo Clinic, Rochester, MN

TH-241

hMSCs as a Source of Functional SMCs for Vascular Tissue Engineering

Emily Caron¹, Hannah Strobel¹, and Marsha Rolle¹
¹Worcester Polytechnic Institute, Worcester, MA

TH-242

In Vivo Evaluation of Endothelialized Dense Collagen Tubes as Interpositional Vascular Grafts

Xuanyue Li¹, Jing Xu¹, Erzsebet Bartolák-Suki¹, John Jiang¹, and Joe Tien¹
¹Boston University, Boston, MA

TH-243

Engineered Congenital Heart Disease Model Using Patient-derived hiPSCs

Morgan Ellis¹, LouJin Song², Masayuki Yazawa², and Elizabeth Lipke¹
¹Auburn University, Auburn, AL, ²Columbia University, New York, NY

TH-244

Recellularization of Decellularized Porcine Myocardial Slice using Stem Cell Sheet

Pawan KC¹, Mickey Shah¹, and Ge Zhang¹
¹University of Akron, Akron, OH

TH-245

In Vivo-Like Intercalated Discs Formation on Mechanical Condition-Matched Substrate

Ailin Wei¹, Xiaoqi Yang², Tiffany Yu², Thomas K Borg³, and Bruce Z Gao²
¹Clemson University, Central, SC, ²Clemson University, Clemson, SC, ³Medical University of South Carolina, Charleston, SC

TH-246

Biofabrication of Tissue-Engineered Vascular Grafts

Sebastian Freeman¹, Luxi Zhou¹, Kyle Reeser¹, Sha Jin¹, and Kaiming Ye¹
¹Binghamton University, Vestal, NY

TH-247

Anisotropic Tension Increases Cardiomyocyte Alignment and Contractile Strain in Composite Fibrin Scaffolds

Elizabeth English¹, Megan Chrobak¹, Marianne Kanellias¹, Katrina Hansen¹, Joshua Gershlak¹, Glenn Gaudette¹, and George Pins¹
¹Worcester Polytechnic Institute, Worcester, MA

TH-248

Leaflet Extensions in Porcine Small Intestinal Submucosa Bio-Scaffolds for Heart Valve Regenerative Applications

Brittany Gonzalez¹, Jenniffer Bustillos¹, Mohammad Shaver¹, Andres Rodriguez¹, Antonio Cuellar¹, Arvind Agarwal¹, and Sharan Ramaswamy¹
¹Florida International University, Miami, FL

TH-249

Endothelial Colony Forming Cell Micropatterning Influences Function Independent of Fluid Shear

Matthew Hagen¹ and Monica Hinds¹
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TH-250

Mechanical History Influences Adventitial Fibroblast Phenotype In PEG Hydrogels

Rebecca Scott^{1,2}, Karyn Robinson², Robert Akins², and Kristi Kiick¹
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TH-251

Engineered Tissue Model of Inflammation Post-myocardial Infarction (MI)Marwa Choudhury¹, Pamela Hitscherich¹, and Eun Jung Lee¹
¹New Jersey Institute of Technology, Newark, NJ

TH-252

Dynamic Bioreactor for Continuous Monitoring of Engineered Heart TissuesRonald Ng¹, Aydin Akyol¹, and Stuart Campbell¹
¹Yale University, New Haven, CT

TH-253

A Naturally Occurring Valve Progenitor Cell for Heart Valve Tissue Engineering PurposesRyan Shephard¹, Andrea Rivero¹, Daniel Gonzalez¹, Agnes Nagy-Mehesz², and Zoltan Hajdu¹
¹Edward Via College of Osteopathic Medicine, Spartanburg, SC, ²Clemson University, Clemson, SC

TH-254

Cardiac Fibroblasts Accelerate Maturation of Human iPSC-derived Cardiac MicrotissuesOriane Matthys¹, Tracy Hookway², Diwakar Turaga³, Michael Lai², and Todd McDevitt²
¹UC Berkeley-UCSF Bioengineering Graduate Program, San Francisco, CA, ²Gladstone Institutes, San Francisco, CA, ³University of California San Francisco, San Francisco, CA

TH-255

Xenogeneic Vein Extracellular Matrix Scaffolds for Coronary Artery Bypass: Effect of ECM on Cell BehaviorManuela Lopera Higuera¹ and Leigh Griffiths²
¹Mayo Clinic College of Biomedical Sciences, Rochester, MN, ²Mayo Clinic College of Medicine, Rochester, MN

TH-256

Biophysical Properties of Nanofibrillar Scaffolds Modulate Endothelial Cell Survival in the Ischemic HindlimbNgan Huang¹, Guang Yang¹, Esra Karaca¹, Cynthia Alcazar², Tatiana Zaitseva³, and Michael Paukshto³
¹Stanford University, Stanford, CA, ²Veteran Affairs Palo Alto Health Care System, Palo Alto, CA, ³Fibralign Corp, Union City, CA**Track: Cellular and Molecular Bioengineering****Cell Migration**

TH-257

A Radial Design of Microfluidic Device for Parallel Chemotaxis ExperimentsJiandong Wu¹, Sabine Hombach-Klonisch¹, Thomas Klonisch¹, and Francis Lin¹
¹University of Manitoba, Winnipeg, MB, Canada

TH-258

Porous Substrates Promote Endothelial Migration at the Expense of Fibronectin FibrillogenesisHenry Chung¹, Stephanie Casillo¹, Spencer Perry¹, and Thomas Gaborski^{1,2}
¹Rochester Institute of Technology, Rochester, NY, ²University of Rochester, Rochester, NY

TH-259

Automated Analysis of Cell Migration and Wound Healing with the Use of SiR-Hoechst Live Cell TrackerHenry Chung¹, Sean Bellefeuille¹, and Thomas Gaborski^{1,2}
¹Rochester Institute of Technology, Rochester, NY, ²University of Rochester, Rochester, NY

TH-260

Perinuclear Actin Flow Promotes Efficient Cell Migration in ConfinementEmily Wisniewski¹, Panagiotis Mistrionis¹, Yizeng Li¹, Robert Law¹, Kauslav Bera¹, Soontorn Tuntithavornwat¹, Alexandros Afthinos¹, Runchen Zhao¹, Catharine Wain¹, Eda Erdogmus¹, Petr Kalab¹, Sean Sun¹, and Konstantinos Konstantopoulos¹
¹Johns Hopkins University, Baltimore, MD

TH-261

Modeling Collective Migration Phenotypes of Heterogeneous Cell Populations of Varying PolarityJairaj Mathur¹, Bapi Sarker¹, and Amit Pathak¹
¹Washington University in St Louis, St Louis, MO

TH-262

Neutrophil-Endothelia Interactions in Mice Do Not Always Predict their Interactions in Humans.Qingliang Yang¹, Fariborz Soroush¹, Yuan Tang¹, Shuang Sun¹, Laurie Kilpatrick¹, and Mohammad Kiani¹
¹Temple University, Philadelphia, PA

TH-263

TGF- β 1 Released from M2 Macrophages Induces Mast Cell Accumulation during AtherogenesisHeng Yu¹, Radhika Joshi¹, Jayant Saksena¹, Ankur Khanna¹, Douglas Chrisey¹, and Damir Khismatullin¹
¹Tulane University, New Orleans, LA

TH-264

Interaction of Monocytes and Endothelial Cells within a Vascular BioreactorPatrick Williamson¹, Max Kozak¹, Rudra Bhowmick¹, and Heather Gappa-Fahlenkamp¹
¹Oklahoma State University, Stillwater, OK

TH-265

CD4+ T Lymphocytes Migrate Upstream and Need VCAM-1 to Display Directional Persistence after FlowHyun Ji Kim¹ and Daniel A. Hammer¹
¹University of Pennsylvania, Philadelphia, PA

TH-266

Protein Kinase C-Delta (PKC Δ) Tyrosine Phosphorylation is a Critical Regulator of Neutrophil-Endothelial Cell Interactions In InflammationJordan Langston¹, Fariborz Soroush¹, Kimberly Guglielmo¹, Alex Engelmann¹, Liverani Elisabetta¹, Shuang Sun¹, Satya Kunapuli¹, Yuan Tang¹, Mohammad Kiani¹, and Laurie Kilpatrick¹
¹Temple University, Philadelphia, PA

TH-267

Immunomodulatory and Wound Healing Properties of Newly Discovered Pimarane Diterpenoids

Sara Moghadam¹ and Ehsan Jabbarzadeh¹
¹University of South Carolina, Columbia, SC

TH-268

Mechanical State of Vinculin in Epithelial Sheet Expansion

Evan Gates¹ and Brenton Hoffman¹
¹Duke University, Durham, NC

TH-269

Fibroblasts Affect Each Other in Making Directional Decision during Chemotaxis in Microfluidic Maze: Insight from Image-based Modelling

Quang Long Pham¹, Lydia N. Rodrigues¹, Nhat Anh Nguyen Tong¹, Cheng Bi¹, David Chege¹, Timothy Dijamco¹, Vishnu Deep Chandran¹, Sagnik Basuray¹, and Roman Voronov¹
¹New Jersey Institute of Technology, NEWARK, NJ

TH-270

Adhesion and Repulsion in Single-Cell Migration

Shlomi Cohen¹, Patrycja Kotowska¹, Patrick Chang¹, Rebecca Keate¹, Dennis Zhou¹, Andres Garcia¹, Shuyi Nie¹, and Jennifer Curtis¹
¹Georgia Tech, Atlanta, GA

TH-271

Directional Cell Migration Decision Making in 3D Confinement

Runchen Zhao¹, Alexandros Afthinos¹, Tian Zhu¹, Christopher Yankaskas¹, Yuqi Zhang¹, Kaustav Bera¹, Panagiotis Mistriotis¹, and Konstantinos Konstantopoulos¹
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Track: Cellular and Molecular Bioengineering, Biomechanics

Cellular and Molecular Biomechanics: Mechanobiology

TH-272

Determination of Cell Polarization under the Combination of Physical, Molecular, and Genetic Cues

Geonhui Lee¹ and Dong-Hwee Kim¹
¹Korea University, Seoul, Korea, Republic of

TH-273

The Effects of Lipopolysaccharide on Osteoclast Activity *In Vitro*

Estee George¹, Alexandria Magyar¹, and Marnie Saunders¹
¹The University of Akron, Akron, OH

TH-274

Quantifying the Roles of Mechanically Stimulated Osteocytes and Inflammation in Bone Remodeling

Estee George¹, Sharon Truesdell¹, Catherine Seno¹, Alexandria Magyar¹, Mariam Crow¹, and Marnie Saunders¹
¹The University of Akron, Akron, OH

TH-275

Vibration and Structural Analysis of Microtubules for Biomechanical Properties

JongWon Kim¹ and Ramana Pidaparti¹
¹University of Georgia, Athens, GA

TH-276

Investigating the Mechanistic Relationship Between Biophysical Behavior and Calcium Bursts in Human Neutrophils

Emmet Francis¹ and Volkmar Heinrich¹
¹University of California Davis, Davis, CA

TH-277

Characterizing Silicone Substrates for Mechanobiology Studies Using a Widefield Fluorescence Microscope

Sandeep Dumbali¹ and Venkat Maruthamuthu¹
¹Old Dominion University, Norfolk, VA

TH-278

Mechanosensitive Fibrillar Force Exertion by Fibroblasts Depends on Vinculin

Mohamad Eftekharjoo¹ and Venkat Maruthamuthu¹
¹Old Dominion University, Norfolk, VA

TH-279

Effect of Lamin a Isoforms on Endothelial Wound Recovery under Shear Stress

Yizhi Jiang¹ and Julie Ji²
¹Indiana University Purdue University Indianapolis, Indianapolis, IN,
²Indiana University-Purdue University Indianapolis, Indianapolis, IN

TH-280

Regulation of the Endothelial Cell Response to Shear Stress by Mitochondrial Calcium

Akshar Patel¹, Thomas Esber¹, Santhanam Shanmughapriya², Muniswamy Madesh², and B. Rita Alevriadou¹
¹The Ohio State University, Columbus, OH, ²Temple University, Philadelphia, PA

TH-288

Mitochondrial Dynamics Regulate Contractility in Engineered Skeletal Muscle

Megan L. Rexius-Hall¹ and Megan L. McCain¹
¹University of Southern California, Los Angeles, CA

TH-289

Wnt Signaling Regulates Macrophage Response to Stiffness and ECM

Jefferson Overlin¹, Kelly Hotchkiss¹, Emily Burtch¹, and Rene Olivares-Navarrete¹
¹Virginia Commonwealth University, Richmond, VA

TH-290

Mechanical Stiffening of Extracellular Matrices by Accumulation of Neutrophil Extracellular Traps

Arvind Chandrasekaran¹, Roni Rayes², Yimai Chen¹, Ajinkya Ghagre¹, Allen Ehrlicher², Jonathan Spicer², and Christopher Moraes²
¹McGill, Montreal, QC, Canada, ²McGill, Montreal, Canada

TH-291

Changes in FRET Ratio Distribution along Single Isolated Stress Fibers Expressing FRET-based Actin Tension Sensor during Stretch

Takeo Matsumoto¹, Masahiro Ito², Eijiro Maeda¹, Junfeng Wang¹, Tsubasa Matsui³, Shinji Deguchi³, and Shukei Sugita²

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TH-292

Measuring Mechanical Heterogeneity in Monolayers using Sensors from IntraNuclear Kinetics

Travis Armiger¹ and Kris Dahl¹

¹Carnegie Mellon University, Pittsburgh, PA

TH-293

ROCK Inhibitor Y27632 Reduces the Low Intensity Vibrations-Induced Elevation and Rearrangement of the Actin Cytoskeleton of Pre-Adipocytes

Stefanie Blanco¹ and Chanpreet Singh¹

¹Stony Brook University, Stony Brook, NY

TH-294

Experimental Methods for Testing the Tensile Properties of Single Vaginal Smooth Muscle Cells

Zachary Miller¹, Alyssa Huntington¹, Jeffrey McGuire¹, Wally Grant¹, and Raffaella De Vita¹

¹Virginia Tech, Blacksburg, VA

TH-295

Nuclear Rupture in Hutchinson-Gilford Progeria-Expressing Cells

Brooke Danielsson¹, Kranthidhar Bathula², and Daniel Conway²

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²Virginia Commonwealth University, Richmond, VA

TH-296

Innovative Approach to Resolve Force-dependent Protein Interactions Using BiOLD

Joleen Cheah¹ and Soichiro Yamada¹

¹University of California, Davis, Davis, CA

TH-297

Abnormal Nuclear Morphologies in Cancer: Role of Chromatin Regulators

Andrew Tamashunas¹, Vincent Tocco¹, James Matthews¹, Hendrik Luesch¹, Jonathan Licht¹, Richard Dickinson¹, and Tanmay Lele¹

¹University of Florida, Gainesville, FL

TH-298

Different Creep Responses in GBM Cells at Different Kinematic States

Ishan Khan¹, Loan Bui¹, Young-Tae Kim¹, and Cheng-Jen Chuong¹

¹University of Texas at Arlington, Arlington, TX

TH-299

Fabrication and Finite Element Analysis of a 3D-Printed Loading Device for Osteocyte Stimulation

Sharon Truesdell¹, Estee George¹, Catherine Seno¹, Mariam Crow¹, and Marnie Saunders¹

¹The University of Akron, Akron, OH

TH-300

Endothelial Glycocalyx Layer Properties in Experimental Sepsis

Luis Delgadillo¹, Elena Lomakina¹, Julie Kuebel¹, and Richard Waugh¹

¹University of Rochester, Rochester, NY

TH-301

FAK Mediates Stretch Regulation of Adipocyte Insulin Signaling

Tasneem Bouzid¹, Eunju Kim¹, and Jung Yul Lim¹

¹University of Nebraska-Lincoln, Lincoln, NE

TH-302

Prestrain Regulates Topo-Mechanical Cues in Fibrous Microenvironments

Edward Bonnevie^{1,2}, Sarah Gullbrand^{1,2}, Tonia Tsinman^{1,2}, Dawn Elliott³, and Robert Mauck^{1,2}

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TH-303

Investigating the Effect of Extracellular Stiffness on Blood-Brain Barrier Integrity

Allison Bosworth¹, Robbie Weinstein¹, Jake Peters², and Ethan Lippmann¹

¹Vanderbilt University, Nashville, TN, ²School for Science and Math at Vanderbilt, Nashville, TN

TH-304

3-D Characterization of Cell Nuclear Anisotropy in Mechanical Confinement

Thea Ornstein¹, Mary Doolin¹, and Kimberly Stroka¹

¹University of Maryland, College Park, MD

TH-305

Examining Vinculin Load-Dependent Protein Localization to Focal Adhesions

Arnold Tao¹, Andrew LaCroix¹, and Brenton Hoffman¹

¹Duke University, Durham, NC

TH-306

Characterizing Real-Time Mechanical and Biochemical Changes in an *In Vitro* Model of Fibrosis

Mariam Y. El-Hattab¹ and Edward A. Sander¹

¹University of Iowa, Iowa City, IA

TH-307

Role of ORAI1 in ATP-Induced Nitric Oxide Production in the Caveolar Compartment

Tenderano Muzorewa¹, Donald Buerk¹, Dov Jaron¹, and Kenneth Barbee¹

¹Drexel University, Philadelphia, PA

TH-308

Osmotic Stretch Regulates Epithelial Acini Morphogenesis and Homeostasis

Vani Narayanan¹ and Daniel Conway¹

¹Virginia Commonwealth University, Richmond, VA

TH-309

Local Effective Stiffness Drives Epithelial Closure Over Non-adhesive Gaps

Xuechen Shi¹, Qiong Wei¹, and Sulin Zhang¹

¹Penn State University, University Park, PA

TH-310

Image Analysis of F-actin small fluctuation in Living Cell

Tomoteru Oka¹, Buntara Sthenly Gan¹, and Noriyuki Kataoka¹
¹Nihon University, Koriyama, Japan

TH-311

Response of Human Microvascular Endothelial Cells to Shear Flow in Immediately Expanding Flow Channel

Kohei Ito¹, Kenta Kanno¹, Ryuichiro Watanabe¹, and Noriyuki Kataoka¹
¹Nihon University, Koriyama, Japan

TH-312

The Influence of Variable Fluid Flow Regimes on Brain Microvascular Endothelial Cell-Cell Junction Structure

Dilshan Ranadewa¹ and Robert Steward¹
¹University of Central Florida, Orlando, FL

TH-313

Toward a Biophysical Understanding of Cell Proliferation During Branching Morphogenesis in the Developing Kidney

Somdutta Chakraborty¹ and Victor Varner¹
¹University of Texas at Dallas, Richardson, TX

TH-314

The Arp2/3 Complex is Necessary for Migration of Glioblastoma Cells in 2D on Compliant Substrates Due to Lamellipodia-Provided Mechanical Advantages

Devin Mair¹, Matthew Perrone¹, Jin Zhu¹, Ceylin Elmasli¹, Seth Weinberg², and Rong Li¹
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TH-315

STIM1 Induces Orai1 Activation via Direct Binding to its C-terminal Domain

Zainab Haydari¹, Hengameh Shams¹, and Mohammad Mofrad²
¹University of California Berkeley, Berkeley, CA, ²University of California Berkeley, Berkeley, CA

TH-316

Water, Ion, and Actin Dynamics in Cell Migration, Cytokinesis, and Volume Control

Yizeng Li¹ and Sean Sun¹
¹The Johns Hopkins University, Baltimore, MD

TH-317

Biomechanical Characterization of Ebola Virus-like Particles

Sajedehalsadat Yazdanparast^{1,2}, Haomin Wang¹, Matthew Dragovich¹, Wenpeng Cao¹, Xiaoji Xu¹, and Xiaohui Zhang¹
¹Lehigh University, Bethlehem, PA

TH-318

Cerebral Blood Flow is a Biomarker of Neuroinflammation and Endothelial NOS after Repetitive Mild TBI

Alyssa Pybus¹, Bharat Sanders^{1,2}, Sitara Sankar¹, Amanda Liew^{1,2,3}, Kyle Cowdrick^{1,2}, Eashani Sathialingam^{1,2}, Levi Wood^{1,3}, and Erin Buckley^{1,2}
¹Georgia Institute of Technology and Emory University, Atlanta, GA, ²Emory University School of Medicine, Atlanta, GA, ³Georgia Institute of Technology, Atlanta, GA

TH-319

Structural Heterogeneity in Blood Clots

Max Kim¹, Wilson Eng¹, Dustin Nguyen¹, Harjot Grewal¹, Amit Saha¹, Sang-Joon Lee¹, and Anand Ramasubramanian¹
¹San José State University, San José, CA

TH-320

Lens Epithelial Cell Proliferation is Modulated by Lens Capsule Strain

Bharat Kumar¹, Rohin Dasari¹, and Matthew Reilly¹
¹The Ohio State University, Columbus, OH

TH-321

A Hydrodynamic Microfluidic Device for Single Red Blood Cell Deformation Analysis

Shi Shen¹, Ricky Park¹, Defei Liao¹, Hao Qiang¹, and Pei Zhong¹
¹Duke University, Durham, NC

TH-322

Novel Method of Epithelial Traction Force Measurement Using Microfabrication

Brian Griffin¹, Christopher Largaespada¹, and Christopher Lemmon¹
¹Virginia Commonwealth University, Richmond, VA

TH-323

Effect of Combined Hydrostatic Pressure and Biaxial Strain on Rat Urothelial Cell Function

Cody Dunton¹, Justin Bacaoat¹, and Jiro Nagatomi¹
¹Clemson University, Clemson, SC

TH-324

Dynamics of Unjamming Transition in Collective Cell Migration

Hyuntae Jeong¹, Youngbin Cho¹, and Jennifer Shin¹
¹KAIST, Daejeon, Korea, Republic of

TH-325

Mechanotargeting of Nanoparticles

Sulin Zhang¹, Qiong Wei¹, and Peter Butler¹
¹Penn State University, University Park, PA

TH-326

Investigating the Effect of Fluid Shear Stress on the Failure of Cancer Cell Membranes

Leah VanDenBosch¹, Benjamin Krog¹, Devon Moose¹, Michael Henry¹, and Sarah Vigmostad¹
¹University of Iowa, Iowa City, IA

TH-327

Thermal and Ultraviolet Acceleration of Bio-Chemo-Mechanical Aspects of Lens Lens Aging

Samuel Croarkin¹, Nicholas Pennza¹, and Matthew Reilly¹
¹Ohio State University, Columbus, OH

Track: Cancer Technologies

Circulating Biomarkers: CTCs Extracellular Vesicles and DNA

TH-328

Biophysical Separation of Ovarian Cancer Cells from Liquid Patient Samples

Nicholas Stone¹, Katherine Young¹, and Todd Sulchek¹
¹Georgia Institute of Technology, Atlanta, GA

Thursday, October 18 | 9:30 am–5:00 pm | GWCC Exhibit Hall

Poster Viewing with Authors & Refreshment Break | 9:30 am–10:15 am and 3:00 pm–3:45 pm

Track: Cancer Technologies, Bioinformatics, Computational and Systems Biology

Computational Modeling of Cancer

TH-329

A Multiscale *In Silico* Model of Endothelial-to-Mesenchymal Transformation and Tumor-Endothelial Cell InteractionsMukti Chowkale¹, Gretchen Mahler¹, Peter Huang¹, and Bruce Murray¹¹Binghamton University, Binghamton, NY

TH-330

Size Dependent Interactions of Graphene Quantum Dots with Tumor Related ProteinsAbimbola Ayoola¹, Sabita Saldanha², Prabir Patra¹, and Isaac Macwan¹¹University of Bridgeport, Bridgeport, CT, ²Alabama State University, Montgomery, AL

TH-331

A Hybrid Model of Tumor Growth and Angiogenesis: Cellular Interaction of Tumor and VasculatureCaleb Phillips¹, Ernesto Lima¹, and Thomas Yankeelov¹¹The University of Texas at Austin, Austin, TX

TH-332

Tumor Growth Kinetic Parameters Serve as Biomarkers for Anti-VEGF Treatment Outcome: Predictions from *In Silico* Mouse StudyQianhui (Jess) Wu¹, Alyssa Arnheim², and Stacey Finley¹¹University of Southern California, Los Angeles, CA, ²Boston University, Boston, MA

TH-333

A Predictive Model of Growth and Adaptation in MCF7 Cancer Cell Populations After Doxorubicin DosingGrant Howard¹, Yasmeen Zubair¹, and Amy Brock¹¹University of Texas at Austin, Austin, TX

TH-334

Utilizing Ecological Principles to Reveal Early Stage Growth Dynamics Relevant to Tumor Initiation and Metastasis DevelopmentKaitlyn Johnson¹, Amy Brock¹, Grant Howard¹, Isha Patel¹, and Le Hoang¹¹The University of Texas at Austin, Austin, TX

TH-335

Agent-Based Modeling of Bystander Effect Due to Chemotherapeutic Treatment in Head and Neck Squamous Cell CarcinomaAndrew Raddatz¹, Chad Glen¹, Josh Lewis¹, and Melissa Kemp¹¹Georgia Institute of Technology and Emory University, Atlanta, GA

TH-336

Modeling of Calcein Penetration in Multilayered Cellular SpheresJacob Kerner¹ and Stephanie McCalla¹¹Montana State University, Bozeman, MT

TH-337

A Computational-experimental Approach to Model Tumor Cell Growth as a Function of Glucose DynamicsJianchen Yang¹, Jack Virostko^{1,2}, and Thomas Yankeelov^{1,2,3}¹University of Texas at Austin, Austin, TX, ²Livestrong Cancer Institutes, Austin, TX, ³Institute for Computational and Engineering Sciences, Austin, TX

TH-338

Agent-Based Model of Epithelial and Mesenchymal Transitions in Heterogeneous Cell Cluster AssemblyHelen Warner¹, Matthew Lazzara¹, and Shayn Peirce¹¹University of Virginia, Charlottesville, VA

TH-339

Computational Methods to Model Cell Adhesion with Varying Receptor PatternsDaniel F. Puleri¹, Mahsa Dabagh¹, and Amanda Randles¹¹Duke University, Durham, NC

TH-340

Modeling the Delivery of an Active Compound Through the Blood-Brain Barrier for Glioblastoma TherapyElif Ozdemir-Kaynak¹, Amina Ann Qutub², and Ozlem Yesil Celiktas¹¹Ege University, Izmir, Turkey, ²Rice University, Houston, TX

TH-341

A Computational-experimental Model to Predict the Response Of Glioma Cells To RadiotherapyJunyan Liu¹, David Hormuth¹, Tessa Davis¹, and Thomas Yankeelov¹¹University of Texas at Austin, Austin, TX

TH-342

Evaluating the Influence of Size and Stiffness of Eukaryotic Cancer Cells in Microfluidic SimulationsSayan Roychowdhury¹, John Gounley¹, and Amanda Randles¹¹Duke University, Durham, NC

TH-343

Informatics-based Literature Mapping to Expedite Research for Chronic Myeloid LeukemiaNidhi Mehra¹, Andrew Sedler¹, and Cassie Mitchell²¹Georgia Institute of Technology, Atlanta, GA, ²Georgia Institute of Technology & Emory University, Atlanta, GA

Track: Drug Delivery & Intelligent Systems, Biomaterials

Drug Delivering Biomaterials

TH-344

Design, Formulation and Release Properties of Naproxen-starch Nanocrystals from *Digitaria exilis* and *Dioscorea dumetorum* StarchesMichael Odeniyi¹, Adewale Adepoju¹, and Kolawole Jaiyeoba¹¹University of Ibadan, Ibadan, Nigeria

TH-345

Soft Implantable Device Embedded with Multi-channels and Reservoirs for Controlled Drug Delivery

Han Bi Ji¹, Se-Na Kim¹, Seung Ho Lee¹, Beom Kang Huh¹, and Young Bin Choy¹

¹Seoul National University, Seoul, Korea, Republic of

TH-346

Targeted Delivery of Therapeutic Factors via Free Radical Mediated Immobilization

Emily DiMartini¹, Christopher Lowe¹, Keana Mirmajiles¹, Adam Gormley¹, and David Shreiber¹

¹Rutgers, The State University of New Jersey, Piscataway, NJ

TH-347

Simulation and Engineering of HDL-Mimetic Nanostructures Functionalized by Paraoxonase-1

Taeyoung Kim¹, Yoshitaka Sei¹, Michael Toth¹, Sang Eun Jee¹, Seung Soon Jang¹, and YongTae Kim¹

¹Georgia Institute of Technology, Atlanta, GA

TH-348

Multilayer Capsules as Theranostic Agents for Drug Delivery Using Pulsed HIFU

Sithira Ratnayaka¹, Aaron Alford¹, Veronika Koslovskaya¹, and Eugenia Kharlampieva¹

¹University of Alabama at Birmingham, Birmingham, AL

TH-349

Engineered Responsive Microbubbles Enable Intravenous Oxygen Delivery and Improve Survival from Cardiac Arrest

Brian Polizzotti¹, Yifeng Peng¹, Raymond Seekell¹, Alexis Cole², Jemima Lamothe², Andrew Lock², Sarah van den Bosch², Xiaoqi Tang², and John Kheir¹

¹Harvard Medical School and Boston Children's Hospital, Boston, MA,

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TH-350

Redox and pH Dual-Responsive Polymeric Micelle with Aggregation-Induced Emission Feature for Cellular Imaging and Chemotherapy

Weihua Zhuang¹, Gaocan Li¹, and Yunbing Wang¹

¹Sichuan University, Chengdu, China, People's Republic of

TH-351

TRAIL-coated Leukocytes Neutralize Tumor Cells in the Flowing Blood from Colorectal Cancer Patients

Nerymar Ortiz Otero^{1,2}, Tejas Subramanian¹, and Michael R. King¹

¹Vanderbilt University, Nashville, TN, ²Cornell University, Ithaca, NY

TH-352

Drug Elution Through Nanocoatings For Efficient Inhibition of Vascular Smooth Muscle Cells

Yu Mao¹ and Bin Zhi¹

¹Oklahoma State University, Stillwater, OK

TH-353

Alginate Encapsulation for Bupivacaine Delivery And MSC Co-therapy

Mollie Davis¹, Xiomara Perez¹, Ileana Marrero-Berrios¹, Timothy Maguire¹, Charles Rabolli¹, Rene Schloss¹, Joel Yarmush², and Martin Yarmush¹

¹Rutgers University, Piscataway, NJ, ²New York Presbyterian- Brooklyn Methodist Hospital, Brooklyn, NY

TH-354

Noninvasively Measuring Release from an Injectable Drug Implant using Diffusion-weighted MRI

Kelsey Hopkins¹, Nicole Vike¹, Xin Li¹, Joseph Rispoli¹, and Luis Solorio¹

¹Purdue University, West Lafayette, IN

TH-355

Combining Inhibition and Disruption of Bacterial Biofilms Using Polymerized Cyclodextrin Microparticles

Rebecca Haley¹, Sean Zuckerman¹, and Horst von Recum¹

¹Case Western Reserve University, Cleveland, OH

TH-356

Ocular Drug Delivery of *In Situ* Forming Bevacizumab-Hyaluronic Acid Hydrogel into the Suprachoroidal Space for Sustainable Drug Release

Jaehwan Jung¹, Seongshik Kim¹, and Mark Prausnitz¹

¹Georgia Institute of Technology, Atlanta, GA

TH-357

A Biodegradable, 3D-Printed Implantable for Minimally-Invasive Controlled Delivery

Priya Jain¹, Austin Schoppe¹, Joshua Gale¹, and R. Lyle Hood¹

¹University of Texas at San Antonio, San Antonio, TX

TH-358

Cas9 gRNA Barcoding for High Throughput Screening of Synthetic Lipid Nanoparticle Libraries

Zachary Glass¹, Mary Haas², Qiaobing Xu¹, Xin Jin², and Feng Zhang²

¹Tufts University, Medford, MA, ²The Broad Institute of MIT and Harvard, Cambridge, MA

TH-359

Prevention of Immune-Mediated Fibrosis and Host Rejection of Biomedical Implants via Engineered Drugs Crystals with Long Term and Controlled Localized Delivery

Shady Farah¹, Joshua Doloff¹, Robert Langer¹, and Daniel Anderson¹

¹MIT, Cambridge, MA

TH-360

Micelle-Encapsulated Liposomes for Dual Delivery of Synergistic Anti-Cancer Therapy

Zhenjiang Zhang¹, Su Bin Hahn¹, and Michael King¹

¹Vanderbilt University, Nashville, TN

TH-361

A Nanoparticle Multi-Drug Delivery Platform for the Treatment of Breast Cancer

Kisha Patel^{1,2}, Stephany Tzeng^{1,2}, and Jordan Green^{1,2}

¹Wilmer Eye Institute, Baltimore, MD, ²Whiting School of Engineering, Baltimore, MD

TH-362

Core-Removal of Hollow Thermo-responsive Sub-Micron Particles for Cell Penetrating Peptide Delivery

Marcus Deloney¹ and Alyssa Panitch¹

¹University of California-Davis, Davis, CA

Thursday, October 18 | 9:30 am–5:00 pm | GWCC Exhibit Hall

Poster Viewing with Authors & Refreshment Break | 9:30 am–10:15 am and 3:00 pm–3:45 pm

TH-363

Electrospun Fibers from a Degradable Poly(carbonate-estrogen) to Attenuate Astrocyte ReactivityDahlia Amato¹, Anthony D'Amato¹, Samuel Ellman¹, Alexis Ziemba¹, Edmund Palermo¹, and Ryan Gilbert¹¹Rensselaer Polytechnic Institute, Troy, NY

TH-364

Modulating the Inflammatory Response to Bioprosthetic Heart Valves Using a Loadable Affinity Based Cytokine Release SystemEmily B. Lurier¹, Anthal Smits², Carlijn Bouten², and Kara Spiller¹¹Drexel University, Philadelphia, PA, ²Technische Universiteit Eindhoven, Eindhoven, Netherlands

TH-365

Calcium Detection for Atherosclerosis using Hydroxyapatite-Binding MicellesDeborah Chin¹, Sampreeti Chowdhuri¹, and Eun Ji Chung¹¹University of Southern California, Los Angeles, CA

TH-366

Evaluation of Nitric Oxide (NO)-Polymer Formulations and their Antibacterial FunctionKagya Amoako¹ and Rana Gbyli¹¹University of New Haven, West Haven, CT

TH-367

Kidney-Targeting Multimodal Micelles for Renal DiseaseJonathan Wang¹ and Eun Ji Chung¹¹University of Southern California, Los Angeles, CA

TH-368

Self-assembly Regulated Anticancer Activity of Platinum Coordinated SelenomethionineTianyu Li¹ and Huaping Xu¹¹Tsinghua University, Beijing, China, People's Republic of

TH-369

Promotion of Skin Wound Healing Using Aptamer-functionalized Fibrin HydrogelsYong Wang¹, Nan Zhao¹, Ming Xu¹, Na Xiong¹, Guo-Hua Fong², and Li-Juan Duan²¹Pennsylvania State University, University Park, PA, ²University of Connecticut, Farmington, CT

TH-370

Radiation Responsible Diselenide-containing Nanoparticles Improve the Synergistic Effect in Cancer RadioimmunotherapyShiqian Gao¹ and Huaping Xu¹¹Tsinghua University, Beijing, China, People's Republic of

TH-371

A Simple Method to Reduce Cationic Nanoparticle Toxicity without Compromising Transfection EfficiencyRandall Toy¹, Pallab Pradhan¹, Vijayeetha Ramesh¹, Blake Lash¹, Jiaying Liu¹, Nelson Di Paolo², Dmitry Shayakhmetov², and Krishnendu Roy¹¹Georgia Institute of Technology, Atlanta, GA, ²Emory University, Atlanta, GA

TH-372

Simultaneous Release of Multiple Bioactive Agents from Electrospun FibersNicholas Schaub¹ and Joseph Corey¹¹University of Michigan, Ann Arbor, MI

TH-373

High Biocompatibility and Efficiency of a Novel *In Vivo* miRNA Delivery System for Rejuvenating Infarcted MyocardiumHuaxiao Yang¹, Kai Li^{1,2}, Huiyuan Wang¹, Xulei Qin¹, Xin Zhao¹, Haodong Chen¹, Hung-Ta Wo¹, Yonggang Liu¹, Chun Liu¹, Nazish Sayed¹, Oscar Abilez¹, and Joseph Wu¹¹Stanford University, Stanford, CA, ²A*STAR, Connexis, Singapore

TH-374

Simvastatin Release Profile from Four Differently Modified Electrospun Chitosan MembraneVishnu Priya Murali¹, Paul Cameron¹, and Joel Bumgardner¹¹University of Memphis, Memphis, TN

TH-375

Core-Shell Microneedle Gel for Self-Regulated Insulin DeliveryJinqiang Wang¹, Yanqi Ye¹, John Buse², and Zhen Gu¹¹The University of North Carolina at Chapel Hill and North Carolina State University, Raleigh, NC, ²University of North Carolina School of Medicine, Chapel Hill, NC

TH-376

Liquid-Infused Nitric Oxide-Releasing Commercial Urinary Catheters for Prevention of Associated Urinary Tract InfectionsKatie Homeyer¹, Marcus Goudie¹, and Priyadarshini Signha¹¹University of Georgia, Athens, GA

TH-377

Versatile Redox-Responsive Polymer-Based Nanoplatfoms for the Delivery of Plasmid DNA, Messenger RNA, and CRISPR-Cas9 Genome Editing MachineryYuyuan Wang¹, Ben Ma², Amr Abdeen¹, Guojun Chen¹, Ruosen Xie¹, Krishanu Saha¹, and Shaoqin Gong¹¹University of Wisconsin-Madison, Madison, WI, ²Fourth Military Medical University, Xi'an, China, People's Republic of

TH-378

Peptide-based Nano-materials For Delivery of Therapeutic FlavonoidsYasaman Hamedani¹, Elvira Lou Evangelista¹, Catherine Neto¹, and Milana Vasudev¹¹University of Massachusetts Dartmouth, North Dartmouth, MA

TH-379

Alginate-Liposomal Bupivacaine Formulation Provides Extended Local Analgesic Effects *In Vivo*Xiomara Perez¹, Mollie Davis¹, Ileana Marrero-Berrios¹, Timothy Maguire¹, Rene Schloss¹, Joel Yarmush², and Martin Yarmush¹¹Rutgers University, Piscataway, NJ, ²New York Presbyterian- Brooklyn Methodist Hospital, Brooklyn, NY

TH-380

Fabrication of Collagen Based Microneedles

Namsoo Kim¹, Rina Koyani², Abhilash Aditya², and Jongwha Chang²
¹The University of Texas at El Paso, EL Paso, TX, ²The University of Texas at El Paso, El Paso, TX

TH-381

Investigative Study on Nitric Oxide Production in Human Dermal Fibroblast Cells Under Normal and High Glucose Conditions

Maria Kwesiga¹, Jennifer Hannon¹, Emily Cook², Sarah Wayward¹, Caroline Gwaltney², Smitha Rao¹, and Megan Frost¹
¹Michigan Technological University, Houghton, MI, ²Central Michigan University, Mt. Pleasant, MI

TH-382

Influence of Poly-L-lysine Molecular Weight on Antibacterial Activity of Polyelectrolyte Films

Dahlia Alkekhia¹ and Anita Shukla¹
¹Brown University, Providence, RI

TH-383

Cargo Delivery via Thaw-Induced Gelation of Sponge-Hydrogel Hybrids and Liquid-Core Capsules

Dustin Hadley¹ and Eduardo Silva¹
¹University of California, Davis, Davis, CA

TH-384

Elucidating the Contrasting Effects of Hydrophobicity and Cationicity In the Stability and pH Responsiveness of Mesoporous Silicon Nanoparticle Composites

Isom Kelly¹ and Craig Duvall¹
¹Vanderbilt University, Nashville, TN

TH-385

Carbon Monoxide Releasing Poly(diol-nicotinamide-citrate) Polymer to Reduce Oxidative Stress

Antonio Webb¹, Bryan James¹, and Darcy Lichlyter¹
¹University of Florida, Gainesville, FL

TH-386

Exploring the Effects of Fabrication Parameters on PLG Particles for Small Molecule Delivery

Christopher Isely¹ and Michael Gower¹
¹University of South Carolina, Columbia, SC

TH-387

Month-Long Protein Release via a Biodegradable and Flexible PLA-CL Scaffold for Soft Tissue Repair

Anupama Prabhath¹, Varadraj Vernekar¹, Sangamesh Kumbhar¹, and Cato Laurencin¹
¹UConn Health, Farmington, CT

TH-388

Injectable Anti-Angiogenic Therapy for Diabetic Retinopathy

Peter Nguyen¹, Biplab Sarkar¹, Sruti Rachapudi¹, and Vivek Kumar¹
¹New Jersey Institute of Technology, Newark, NJ

TH-389

Targeted Stealth Liposomal Nano-Platform for Cancer Therapeutics

Lei Fang¹, Partha Karmakar¹, Rui Tang¹, Matt Mixdorf¹, and Samuel Achilefu¹
¹Washington University in St Louis, St Louis, MO

TH-390

Adhesive and Thermosensitive Gels for Local Virus Delivery *In Vivo*

Jeanette Caronia¹, Daniel Sorensen¹, Hope Leslie¹, Jop van Berlo¹, and Samira Azarin¹
¹University of Minnesota, Minneapolis, MN

TH-391

Bioinspired Diselenide-Bridged Mesoporous Silica Nanoparticles for Dual-Responsive Protein Delivery

Huize Yan¹
¹Columbia University, New York, NY

TH-392

Customized Biodegradable Polymeric Vehicles for Delivery of Nucleic Acids in Diabetic Foot Ulcers

Amy Kauffman¹, Alexandra Piotrowski-Daspit¹, Kay Nakazawa¹, Yuhang Jiang¹, and Mark Saltzman¹
¹Yale University, New Haven, CT

Track: Drug Delivery & Intelligent Systems, Cancer Technologies

Drug Delivery for Immunomodulation and Immunotherapy

TH-393

Formulation and Characterization of Gelatin-DNA Nanoparticles for Gelatin-Zein Nano-in-Microparticles for Oral Non-Viral Gene Delivery

Kari Sanderfer¹, Eric Farris¹, Amanda Ramer-Tait¹, and Angela Pannier¹
¹University of Nebraska-Lincoln, Lincoln, NE

TH-394

Polymer Photocaging Strategies for Signal Effectors of Adaptive Tumor Immunity

Lacey Perdue¹, Priscilla Do², James Kelvin¹, and Erik Dreaden¹
¹Georgia Institute of Technology and Emory University, Atlanta, GA, ²Emory University, Atlanta, GA

TH-395

Novel Antibody-Drug-Conjugate Development for Breast Cancer Treatment

Yingnan Si¹, Jianfa Ou¹, Daniel D Flanigan¹, Jiajia Song², Lufang Zhou², Runhua Liu³, Lizhong Wang³, and X. Margaret Liu¹
¹Department of Biomedical Engineering, University of Alabama at Birmingham, Birmingham, AL, ²Department of Medicine, University of Alabama at Birmingham, Birmingham, AL, ³Department of Genetics, University of Alabama at Birmingham, Birmingham, AL

TH-396

PEGylated PLGA Nanoparticle Delivery of Eggmanone for T Cell Modulation in Autoimmunity

Christopher Haycook¹, Jillian Rhoads¹, Charles Hong¹, Amy Major¹, and Todd Giorgio¹
¹Vanderbilt University, Nashville, TN

Thursday, October 18 | 9:30 am–5:00 pm | GWCC Exhibit Hall

Poster Viewing with Authors & Refreshment Break | 9:30 am–10:15 am and 3:00 pm–3:45 pm

TH-397

Method for Significant Reduction of Residual Copper in Alkyne-Azide “Click” Reaction ProductsEvan Glass¹, Shirin Masjedi¹, Stephanie Dudzinski¹, and Todd Giorgio¹
¹Vanderbilt University, Nashville, TN

TH-398

Tweaking the Immune System: Fusogenic Nanoparticles for Immunogene Treatment Against Bacterial InfectionByungji Kim¹, Hongbo Pang², Jinyoung Kang¹, Ji-Ho Park³, Erkki Ruoslahti², and Michael Sailor¹
¹UC San Diego, La Jolla, CA, ²Sanford Burnham Prebys Medical Discovery Institute, La Jolla, CA, ³Korea Advanced Institute of Science and Technology, Daejeon, Korea, Republic of

TH-399

A Responsive Hydrogel Platform to Deliver Resolution Mediators to Treat Chronic Inflammatory DiseasePadmini Pillai¹, James Webster¹, Ana Jaklenec¹, and Robert Langer¹
¹Massachusetts Institute of Technology (MIT), Cambridge, MA

TH-400

Sublingual Immunization Using a Self-Assembling Peptide-Polymer PlatformSean Kelly¹, Yaoying Wu¹, Ajay Varadhan¹, and Joel Collier¹
¹Duke University, Durham, NC

TH-401

Combined Epigenetic Modulation and Photothermal Therapy Using Indocyanine Green-Nexturastat A-PLGA Nanoparticles for Maximizing the Abscopal EffectDebbie Ledezma¹, Juliana Cano-Mejia², Melissa Beaty¹, Alejandro Villagra¹, and Rohan Fernandes^{1,2,3}
¹The George Washington University, Washington, D.C., DC, ²University of Maryland, College Park, MD, ³Children's National Health System, Washington, D.C., DC

TH-402

Developing Synergy between Immunotherapy and Focused Ultrasound Ablation for Metastatic Breast CancerNatasha Sheybani¹, Alexandra Witter¹, Aaron Stevens¹, Timothy Bullock¹, and Richard Price¹
¹University of Virginia, Charlottesville, VA**Track: Drug Delivery & Intelligent Systems****Topics in Drug Delivery**

TH-403

Preoccupation of Empty Carriers Decreases Endo-/Lysosome Escape and Reduces the Protein Delivery Efficiency of Mesoporous Silica NanoparticlesWen-Qing Li¹, Li-Ping Sun¹, Yiqiu Xia¹, Sijie Hao¹, Gong Cheng¹, Zhigang Wang¹, Yuan Wan¹, Chuandong Zhu¹, Hongzhang He¹, and Si-Yang Zheng¹
¹Penn State University, University Park, PA

TH-404

Acetazolamide and Verapamil: Innovative Drugs to Modulate Drug Clearance from the Brain via Cerebrospinal Fluid PathwaysMariagemiliana Dessi¹, Sonia Yevick¹, and Jay C Sy¹
¹Rutgers University, Piscataway, NJ

TH-405

Bilayer Microneedle Arrays for Passive and Active Drug DeliveryHossein Derakhshandeh¹, Ali Farzin², Mike Schot², Adele Fenalli², Andrea Gemma², Ian Ghanavati¹, Pooria Mostafalu², and Ali Tamayol¹
¹University of Nebraska-Lincoln, Lincoln, NE, ²Harvard Medical School, Boston, MA

TH-406

Deducing and Interpreting HIV Infection Probability and its Reduction by Integrating Mass Transfer Mechanisms for Virions and anti-HIV Molecules with Viral Infection DynamicsDaniel Adrianzen Alvarez¹ and David Katz¹
¹Duke University, Durham, NC**Track: Cellular and Molecular Bioengineering****Engineering and the Extracellular Matrix and Plasma Membrane**

TH-407

Specific MicroRNAs Present in Matrix Vesicles Regulate Growth Plate Chondrocyte Proliferation and MaturationNiels Asmussen¹, Michael McClure¹, Zhao Lin¹, Zvi Schwartz^{1,2}, and Barbara Boyan^{1,3}
¹Virginia Commonwealth University, Richmond, VA, ²The University of Texas Health Science Center, San Antonio, TX, ³Georgia Institute of Technology, Atlanta, GA**Track: Cellular and Molecular****Bioengineering, Tissue Engineering****Engineering Multi-cellular Systems**

TH-408

Longitudinal Label-free Visualization of Tumor Spheroid Morphology Via Optical Coherence TomographyCassandra Roberge¹, Denzel Faulkner¹, C. J. Sloat¹, David Kingsley¹, Xavier Intes¹, and David Corr¹
¹Rensselaer Polytechnic Institute, Troy, NY

TH-409

Pneumatic Actuation of Tension in 3D MicrotissuesAchini Opathalage¹, Alex Lammers¹, Samuel Ghilardi¹, Jeroen Eyckmans^{1,2}, and Allyson Sgro¹
¹Boston University, Boston, MA, ²Harvard University-Wyss Institute for Biologically Inspired Engineering, Boston, MA

TH-410

A 3D Bioprinted Model of an Artery with Living Vascular Endothelial Cells, Smooth Muscle Cells and FlowKarli Gold¹, Tyler Snell¹, Rachel Dedas¹, Akhilesh Gaharwar¹, and Abhishek Jain¹
¹Texas A&M University, College Station, TX

TH-411

Induction of Microvascular Network Growth in the Mouse Mesentery

Ariana Suarez-Martinez¹, Shayn Peirce-Cottler², Brant Isakson², Joshua Scallan³, and Walter Lee Murfee¹
¹University of Florida, Gainesville, FL, ²University of Virginia, Charlottesville, VA, ³University of South Florida, Tampa, FL

TH-412

Single-Cell RNA-Seq Confirms Growth Plate Zonal Architecture in 3D Alginate Hydrogel *In Vitro* Model

Sophie Walsh¹, Alek Erickson², Donghee Lee², Taylor Laughlin¹, Andrew Dudley², and Angela Pannier¹
¹University of Nebraska-Lincoln, Lincoln, NE, ²University of Nebraska Medical Center, Omaha, NE

TH-413

Human Colon Function *Ex Vivo*: Dependence on Cellular Diversity

Luke Schwerdtfeger¹, Nora Jean Nealon¹, Elizabeth Ryan¹, and Stuart Tobet¹
¹Colorado State University, Fort Collins, CO

TH-414

Tissue Engineered Nigrostriatal Pathway as a Test-Bed for Evaluating Axonal Pathophysiology

Elisia Clark^{1,2}, Laura Struzyna^{1,2}, Wisberty Gordián-Vélez^{1,2}, H. Isaac Chen^{1,2}, John E. Duda^{1,2}, and D. Kacy Cullen^{1,2}
¹University of Pennsylvania, Philadelphia, PA, ²Center for Neurotrauma, Neurodegeneration & Restoration, CMC VA Medical Center, Philadelphia, PA

TH-415

Exogenous Growth Factor Administration to Prevascularized Constructs and the Endothelial Response

Sarah Grace Dennis¹, Sanket Pattanaik¹, Heather Bainbridge¹, and Michael Yost¹
¹Medical University of South Carolina, Charleston, SC

TH-416

Role of Bacteria in Regulating Activity of Enzymes Responsible for Metabolism of Drugs

Chengyao Wang¹, Andrea Cancino¹, and Abhinav Bhushan¹
¹Illinois Institute of Technology, Chicago, IL

TH-417

3D-cultured Adipose Tissues for High-throughput Single Spheroid Assays

David Mertz¹ and Shuichi Takayama¹
¹Georgia Tech, Atlanta, GA

TH-418

Autologous Human *In Vitro* Platforms to Study the Effect of Macrophages on Engineered Heart Tissues

Emily Wrona^{1,2}, Adriana Beltran³, Ana Martins^{1,2}, Lewis Gaffney^{1,2}, and Donald Freytes^{1,2}
¹University of North Carolina-CH/North Carolina State University, Raleigh, NC, ²Comparative Medicine Institute, Raleigh, NC, ³University of North Carolina School of Medicine, Chapel Hill, NC

TH-419

Engineering Human Hepatocyte and Cholangiocyte Co-cultures for Disease Modeling

Jennifer Liu¹ and Salman Khetani¹
¹University of Illinois at Chicago, Chicago, IL

TH-420

Live-cell Imaging of Cancer Cell-derived Exosomes in the Tumor Microenvironment Inducing Normal Fibroblast Differentiation by Exosomal TGF-beta using a Microfluidic Device

Hyejin Park¹, Jaehoon Kim¹, Hyunjung Oh¹, and Seok Chung¹
¹Korea University, Seoul, Korea, Republic of

TH-421

Iron Homeostasis in Intestinal Epithelial Cells

Caroline Ghio¹, Marissa Puzan¹, Andrew Ghio², and Abigail Koppes¹
¹Northeastern University, Boston, MA, ²Environmental Protection Agency, Chapel Hill, NC

TH-422

Quantifying ERK Dynamics in Response to Wounding in a 3D Stromal Tissue Model

Breanna O'Reilly¹, Samuel Ghilardi¹, and Allyson Sgro¹
¹Boston University, Boston, MA

TH-423

The Effects of Pulsatile Shear on Cardiomyocyte Proliferation Via Endothelial Neuregulin Signaling

Matthew Watson¹, Lauren Baugh¹, Lauren Black III¹, and Erica Kemmerling¹
¹Tufts University, Medford, MA

Track: Stem Cell Engineering

Engineering Organoid Development & Morphogenesis

TH-424

The Role of Angiogenic Growth Factors in Islet Organoid Development from Stem Cells

Soujanya S Karanth¹, Huanjing Bi¹, Kaiming Ye¹, and Sha Jin¹
¹State University of New York, Binghamton, Binghamton, NY

TH-425

Engineering Spatial-Patterned Human Cardiac Organoids for Embryotoxicity Testing

Plansky Hoang¹, Stephanie Lemus¹, and Zhen Ma¹
¹Syracuse Biomaterials Institute-Syracuse University, Syracuse, NY

TH-426

Antibody-Based Platform for High Content Analysis of 3D iPSC-Derived Human Neural Cultures & Tissue Constructs

Martin Tomov^{1,2,3}, Alison O'Neil^{1,2}, Dosh Whye², Silvia Piccinotti^{1,2}, Kyle Karhohs¹, Maria Alimova¹, Jean Santos¹, Mark Bathe³, and Lee Rubin²
¹Broad Institute, Cambridge, MA, ²Harvard University, Cambridge, MA, ³Massachusetts Institute of Technology, Cambridge, MA

Track: Stem Cell Engineering

Gastrointestinal Stem Cell Engineering

TH-427

Application of the Intestinal Organoids as a Carrier for PLGA Nanoparticles to Treat Inflammatory Bowel Disease

Zahra Davoudi¹, Nathan Peroutka-Bigos¹, Bryan Bellaire¹, Michael Wannemuehler¹, Balaji Narasimhan¹, Terrence A. Barrett², and Qun Wang¹
¹Iowa State University, Ames, IA, ²University of Kentucky, Lexington, KY

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Track: Cellular and Molecular Bioengineering**Gene Delivery and Genome Bioengineering****TH-428****Overexpression of Nkx6.1 Leads to Neurogenesis After Spinal Cord Injury**Misaal Patel¹, Jeremy Anderson¹, Shunyao Lei¹, Rebecca Risman¹, and Li Cai¹¹Rutgers University, Piscataway, NJ**TH-429****Molecular Mechanisms of Glucocorticoid-Induced Enhancement of Non-Viral Gene Delivery to Human Mesenchymal Stem Cells**Andrew Hamann¹, Kelly Broad¹, Albert Nguyen¹, and Angela K. Pannier¹¹University of Nebraska--Lincoln, Lincoln, NE**TH-430****Neuroendocrine Tumor Stable Cell Line Development**Danny Flanigan¹, Yichen Guo¹, Ningning Xu¹, Patrick Ernst¹, Lufang Zhou¹, Renata Jaskula-Sztul¹, and Margaret Liu¹¹University of Alabama Birmingham, Birmingham, AL**TH-431****Targeted Exon Skipping using Adenine Base Editors**Jackson Winter¹, Michael Gapinske¹, Wendy Woods¹, and Pablo Perez-Pinera^{1,2}¹University of Illinois at Urbana Champaign, Urbana, IL,²Institute for Genomic Biology, Urbana, IL**TH-432****In Silico and Experimental Analysis of CRISPR/Cas9 Target Site Profile for Personalized Medicine**Yidan Pan¹, Ciaran Lee¹, Harshavardhan Deshmukh¹, and Gang Bao¹¹Rice University, Houston, TX**TH-433****Targeted Deletion of Expanded (GAA)n Repeats in Friedreich Ataxia using Triplex DNA Binding Agents**Virali Parekh¹, Roshan Thakuri², Janelle Fried³, Erica Everson¹, Kyden DeGross¹, Ary Marsee¹, Mark Novak¹, and Richard Sinden¹¹South Dakota School of Mines and Technology, Rapid City, SD,²Bureau of Criminal Apprehension, St Paul, MN, ³University of

Washington School of Medicine, Seattle, WA

TH-434**CRISPR/Cas9 based Gene Correction of CFTR Mutation in Induced Pluripotent Stem Cells**Mithil Chokshi¹, Gang Bao¹, and Ciaran Lee¹¹Rice University, Houston, TX**TH-435****Developing Gene Therapies for Inherited Blindness using CRISPR/Cas9 Genome Editing and Human Pluripotent Stem Cells**Amr Abdeen¹, Benjamin Steyer¹, Jared Carlson-Stevermer¹, Guojun Chen¹, Ruosen Xie¹, Yuyuan Wang¹, Pawan Shahi¹, Divya Sinha¹, David Gamm¹, Bikash Pattnaik¹, Shaoqin Gong¹, and Krishanu Saha¹¹University of Wisconsin-Madison, Madison, WI**TH-436****CRISPR-Cas9 Based Rapid and Efficient Engineering of Neoantigen Specific T Cells for Cancer Immunotherapy**So Hyun Park¹, Ciaran Lee¹, and Gang Bao¹¹Rice University, Houston, TX**TH-437****Optimization of Non-Viral Methods for Delivery of CRISPR-CAS9 and Donor Templates to Treat Familial Hypercholesterolemia**Tanner Rathbone¹, Renee Cottle², and Lawrence Fernando²¹Clemson University, Central, SC, ²Clemson University, Clemson, SC**TH-438****CRISPR Base Editing with BE3 Enables Permanent Exon Skipping**Michael Gapinske¹, Alan Luu¹, Jackson Winter¹, Wendy Woods¹,Kurt Kostan¹, Nikhil Shiva¹, Jun Song¹, and Pablo Perez-Pinera¹¹University of Illinois at Urbana-Champaign, Urbana, IL**TH-439****The Effect of Electroporation Buffer Composition on Cell Viability and Transfection Efficiency**Joseph Sherba¹, Jerry Shan¹, Hao Lin¹, David Shreiber¹, and Jeffrey Zahn¹¹Rutgers University, Piscataway, NJ**Track: Neural Engineering****Glial Cell Engineering****TH-440****Immunomodulation of Brain Immune Cells by Electrical Stimulation**Eunyoung Park¹ and Jennifer Shin¹¹KAIST, Daejeon, Korea, Republic of**Track: Cardiovascular Engineering****Heart Valve Structure, Function, and Disease****TH-441****MiR-483 Inhibits Shear-Induced Aortic Valve Endothelial Dysfunction and Calcification Via Silencing Of Ube2c And HIF1 α** Joan Fernandez Esmerats¹, Nicolas Villa-Roel¹, Sandeep Kumar¹, Lina Gu², and Hanjoong Jo¹¹Georgia Institute of Technology and Emory University, Atlanta, GA,²Georgia Institute of Technology, Atlanta, GA**TH-442****The Effect of Leaflet Prestrain on the Dynamic Function of the Aortic Heart Valve**Rana Zakerzadeh¹, Ming-Chen Hsu², and Michael Sacks¹¹University of Texas at Austin, Austin, TX, ²Iowa State University

Ames, IA

TH-443**A Patient-Specific Approach to Address Clinical Complications in Transcatheter Aortic Valve Replacement**Matteo Bianchi¹, Ram Ghosh¹, Gil Marom², Vladimir Kashirin³, Praveen Sridhar⁴, Karl D'souza⁵, Wojtek Zietak⁶, and Danny Bluestein¹¹Stony Brook University, Stony Brook, NY, ²Tel Aviv University, Tel Aviv,Israel, ³Capvidia, NV, Moscow, Russian Federation, ⁴Dassault Systemès,Simulia, Aachen, Germany, ⁵Dassault Systemès, Simulia, Johnston, RI,⁶Capvidia, NV, Leuven, Belgium

TH-444

Time-varying Geometry Determination of a TAVR Leaflet using Stereophotography

Cetin Canpolat¹, Vahid Sadri¹, Eric L. Pierce¹, Shelly Singh-Gryzbon¹, Beatrice Ncho¹, Sanchita Bhat¹, and Ajit P. Yoganathan¹
¹Georgia Institute of Technology, Atlanta, GA

TH-445

Towards Patient-specific Procedural Planning for Trans-catheter Mitral Valve Replacement

Keshav Kohli¹, Zhenglun Alan Wei¹, Vahid Sadri¹, Thomas Easley¹, John Oshinski², Vasilis Babaliaros², and Ajit Yoganathan¹
¹Georgia Institute of Technology/ Emory University, Atlanta, GA, ²Emory University, Atlanta, GA

TH-446

Paracrine Effects of Oscillatory Shear Stress on Valvular Endothelial to Interstitial Cells in the Context of Aortic Valve Calcification

Sana Nasim¹, Denise Medina¹, Joshua Hutcheson¹, and Sharan Ramaswamy¹
¹Florida International University, Miami, FL

TH-447

Label-Free Optical Biomarkers for Assessing Calcification Progression in the Aortic Valve

Ishita Tandon¹, Olivia Kolenc¹, Alan Woessner¹, Isaac Vargas Lopez¹, Kyle Quinn¹, and Kartik Balachandran¹
¹ University of Arkansas, Fayetteville, AR

TH-448

Celecoxib Use is Associated with Aortic Stenosis Diagnosis in a Large Electronic Medical Record

Michael Raddatz¹, Meghan Bowler¹, and W. David Merryman¹
¹Vanderbilt University, Nashville, TN

TH-449

Mechanical Hardness of Calcified Lesions in Aortic Stenosis and Prediction using Computed Tomography

Takashi Shirakawa^{1,2,3}, Masao Yoshitatsu², Koichi Maeda³, Yasushi Koyama⁴, Akira Kurata⁵, Toru Miyoshi⁶, Hiroki Mizoguchi², Takanori Shibukawa¹, Koichi Toda³, Toru Kuratani³, Nobuo Sakagoshi¹, and Yoshiki Sawa³
¹Kinan Hospital, Wakayama, Japan, ²Kansai Rosai Hospital, Hyogo, Japan, ³Osaka University Graduate School of Medicine, Osaka, Japan, ⁴Sakurabashi Watanabe Hospital, Osaka, Japan, ⁵Ehime University Graduate School of Medicine, Ehime, Japan, ⁶Okayama University Graduate School of Medicine, Okayama, Japan

TH-450

Effect of Cyclic Stretch on MiR-214 And MiR-122-5p Expression in Aortic Valve

Md Tausif Salim¹, Joan Fernandez Esmerats^{1,2}, Sivakkumar Arjunon^{1,2}, Hanjoong Jo^{1,2}, and Ajit Yoganathan^{1,2}
¹Georgia Institute of Technology, Atlanta, GA, ²Emory University, Atlanta, GA

TH-451

Histological Comparison of Healthy and Diseased Pediatric Cardiac Valve Tissue

Daniel Perry¹, Rebekah Deardurff¹, Arielle Waller¹, Nava Rijal¹, Farhan Zafar², David Morales², and Daria Narmoneva¹
¹University of Cincinnati, Cincinnati, OH, ²Cincinnati Children's Hospital Medical Center, Cincinnati, OH

TH-452

Aortic Valve Endothelial Dysfunction is Attenuated by Flow-Mediated Increased Expression of MiR-483 and Downregulation of its Target, Ash2L

Nicolas Villa-Roel¹, Joan Fernandez Esmerats¹, Sandeep Kumar¹, and Hanjoong Jo¹
¹Georgia Tech & Emory University, Atlanta, GA

TH-453

A First Mathematical Model for Valvular Interstitial Cell Signaling

Daniel P Howsmon¹ and Michael S Sacks¹
¹The University of Texas at Austin, Austin, TX

TH-454

Patient-specific Image-based Prediction of Mitral Valve Function After Annuloplasty Surgery

Amir Khalighi¹, Bruno Rego¹, Andrew Drach¹, Robert Gorman², Joseph Gorman², and Michael Sacks¹
¹The University of Texas at Austin, Austin, TX, ²University of Pennsylvania, Philadelphia, PA

TH-455

3D Bioprinting a Multilayer Heart Valve Scaffold by Mimicking Leaflet Microstructure

Aline Nachlas¹, Siyi Li¹, and Michael Davis¹
¹Georgia Institute of Technology, Atlanta, GA

TH-456

Investigating Endothelial to Mesenchymal Transformation: A Microfluidic Model of Calcific Aortic Valve Disease

Melissa Mendoza¹, Sara Mina², Peter Huang¹, Bruce Murray¹, and Gretchen Mahler¹
¹Binghamton University, Binghamton, NY, ²Massachusetts Institute of Technology, Cambridge, MA

Track: Stem Cell Engineering

Hematopoietic Stem Cell Engineering

TH-457

Gelatin Platform for Selective Domains of Autocrine and Paracrine Signaling in HSC Maintenance

Aidan Gilchrist¹ and Brendan Harley¹
¹University of Illinois at Urbana-Champaign, Urbana, IL

Track: Cardiovascular Engineering, Biomechanics

Hemodynamics and Vascular Mechanics

TH-458

Effects of an Aneurysm on Wall Shear Rates at a Parent-Daughter Tube Junction

Tyler Will¹ and Daniel Cavanagh¹
¹Bucknell University, Lewisburg, PA

TH-459

Simulation of Helical Buckling of Arteries under Combined Lumen Pressure and Axial Torque

Mohammad Sharzehee¹ and Hai-Chao Han¹
¹University of Texas at San Antonio, San Antonio, TX

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TH-460

Dilatative Cardiomyopathy Reduces Left Ventricle Efficiency and Ejection FractionElizabeth Jermyn¹, Francesco Viola², James Warnock³, and Roberto Verzicco²¹Mississippi State University, Mississippi State, MS, ²Università di Roma Tor Vergata, Rome, Italy, ³University of Georgia, Athens, GA

TH-461

Analysis of Red Blood Cell Lingerin in Artificial Bifurcating MicrovasculatureAndrew Pskowski¹ and Jeffrey Zahn¹¹Rutgers, The State University of New Jersey, Piscataway, NJ

TH-462

A Role for Cadherin-11 in Macrophage-Driven Vascular InflammationCamryn Johnson¹, MacRae Linton¹, and W. David Merryman¹¹Vanderbilt University, Nashville, TN

TH-463

Intra-aneurysmal Hemodynamics and Clotting are Modulated by Coil Placement and Shape *In Vitro*Brittany Earnest¹, Avery Evans¹, and Brian Helmke¹¹University of Virginia, Charlottesville, VA

TH-464

Artifact in Pressure Measurement With Pulmonary Artery Pressure CathetersAbhinav Kanukunta¹, Mark Slaughter², Landon Tompkins¹, Todd Adams², Michael Sobieski², Steven Koenig^{1,2}, Joanna Joly³, and Robert Bourge³¹Department of Bioengineering, University of Louisville, Louisville, KY, ²Department of Cardiovascular & Thoracic Surgery, University of Louisville, Louisville, KY, ³Department of Medicine, The University of Alabama at Birmingham, Birmingham, AL

TH-465

Hydration Level Assessment with Peripheral Venous Pressure Waveform AnalysisAli AlAlawi¹, Md Abul Hayat¹, Patrick Bonasso², Jeffrey M Burford², Melvin S Dassinger², Hanna K Jensen¹, Jingxian Wu¹, Kevin W Sexton², and Morten O Jensen¹¹University of Arkansas at Fayetteville, Fayetteville, AR, ²University of Arkansas for Medical Sciences, Little Rock, AR

TH-466

Thrombus-inhibited Oxygen Transport in Abdominal Aortic AneurysmsSudharsan Madhavan¹, Robert Peattie², Robert Fisher³, Simone Melchionna⁴, and Erica Kemmerling¹¹Tufts University, Medford, MA, ²Tufts Medical Center, Boston, MA, ³Massachusetts Institute of Technology, Cambridge, MA, ⁴Exa Corporation, Burlington, MA

TH-467

Non-axisymmetric Model of Abdominal Aortic Aneurysm Growth and DilatationWenjian Lin¹, Mark Iafrati², Robert Peattie³, and Luis Dorfmann¹¹Tufts University, Medford, MA, ²Tufts Medical Center, Boston, MA, ³Tufts University / Tufts Medical Center, Boston, MA

TH-468

Effects of Highly Elevated Upstream Shear Forces on Priming of Platelets for**Downstream Adhesion and Activation**Shekh Rahman¹ and Vladimir Hlady¹¹University of Utah, Salt Lake City, UT

TH-469

A Combined Fluid-solid-growth Model of the Uterine Vasculature in Normal Pregnancy and PreeclampsiaRudolph Gleason¹¹Georgia Institute of Technology, Atlanta, GA

TH-470

Novel Non-Invasive Quantification of Coronary Artery StenosisJavad Hashemi¹, Shahab Ghafghazi¹, and R. Eric Berson¹¹University of Louisville, Louisville, KY

TH-471

Simulating Elevated Velocities in the Carotid and Cerebral Arteries of a Sickle Cell Mouse ModelChristian Rivera^{1,2}, Li Li², George McAlear¹, Shuangyi Cai¹, Victor Omojola¹, Alessandro Veneziani¹, Yunlong Huo², and Manu Platt¹¹Georgia Institute of Technology and Emory University, Atlanta, GA,²Peking University, Beijing, China, People's Republic of

TH-472

The Effect of Shear Stress Gradients on Endothelial Cell Migration and Vascular RemodelingNir Maimon¹, Despina Bazou², Ethel Pereira¹, Huabing Li¹, James Baish³, and Lance Munn¹¹Massachusetts General Hospital/ Harvard Medical School, Boston, MA, ²mater Misericordiae University Hospital, Dublin, Ireland,³Bucknell University, Lewisburg, PA

TH-473

Sensitivity of Predicted Hemodynamic Environment in Murine Aorta to Prescribed Boundary ConditionsKelly Smith¹, Lucas Timmins¹, Edward Hsu¹, and Samer Merchant¹¹University of Utah, Salt Lake City, UT

TH-474

Probing the Effects of Hyperglycemia on Endothelial Intercellular StressMd. Mydul Islam¹ and Robert Steward Jr.¹¹University of Central Florida, Orlando, FL**Track: Biomedical Imaging and Instrumentation, Translational Biomedical Engineering****Image Guided Therapies**

TH-475

Low Cost Automated Microscope Stage with Fluorescent Image Tracking CapabilitiesConnor Watson¹, Kevin Mathew¹, Mahdy Nouredine¹Richie Ramdhanie¹, Helena van Nieuwenhuizen¹, Arjun Chopra¹, and Helmut Strey¹¹Stony Brook University, Stony Brook, NY

Track: Biomedical Imaging and Instrumentation, Cardiovascular Engineering

Imaging in Cardiovascular Systems

TH-476

Redistribution of Blood Volume in Arteries and Veins Due to Changes in Core Body Temperature

A. Colleen Crouch¹, Amos Cao¹, Ulrich Scheven¹, and Joan Greve¹
¹University of Michigan, Ann Arbor, MI

TH-477

Endoscopic Micro-Optical Coherence Tomography (M μ -OCT) For Coronary Artery Imaging

Junyoung Kim¹, Jingchao Xing¹, Min Woo Lee¹, Joon Woo Song², Youngdae Joo², Jin Won Kim², and Hongki Yoo¹
¹Hanyang University, Seoul, Korea, Republic of, ²Korea University Medical School, Seoul, Korea, Republic of

TH-478

Inter-Observer Reproducibility of Regional Myocardial Strain Using Strain-ENCodeD (SENC) Cardiac MRI-A Multicenter Validation Study

Asma Shuaibi¹, Kohei Matsumoto^{1,2,3}, Neha Goyal², Darius Dabir⁴, Sebastian Kelle⁵, Marcella Vaicik^{1,2}, Amit R. Patel², and Keigo Kawaji^{1,2}
¹Illinois Institute of Technology, Chicago, IL, ²The University of Chicago, Chicago, IL, ³University of Illinois-Chicago, Chicago, IL, ⁴University of Bonn, Bonn, Germany, ⁵German Heart Institute, Berlin, Germany

TH-479

Imaging the Functional Response of the Preeclamptic Placenta to Therapy

Dylan Lawrence¹ and Carolyn Bayer¹
¹Tulane University, New Orleans, LA

TH-480

Artificial Intelligence Predicts Heart Disease: Neural Network Plaque Classification on IVOCT Images

Victoria Milosek¹, Vikram Baruah¹, and Thomas Milner¹
¹The University of Texas- at Austin, Austin, TX

TH-481

Stress Analyses of 3D Coronary Plaque Models Based on Intravascular Ultrasound Images

Goksu Avdan¹, Jon Klingensmith¹, Felix Lee¹, Serdar Celik¹, Vikas Alluri¹, and Naga Maddali¹
¹Southern Illinois University Edwardsville, Edwardsville, IL

TH-482

A New 3D Appearance Model for Accurate Segmentation of Brain Vascular System

Fatma Taher¹, Ahmed Soliman², Ali Mahmoud², Ahmed Shalaby², and Ayman El-Baz²
¹Zayed University, Dubai, United Arab Emirates, ²University of Louisville, Louisville, KY

TH-483

Intra- and Inter-observer Variability and Reliability of The Femoral Artery Pseudoaneurysms Neck Measurements from B-mode Ultrasound Images

Reham Kaifi¹, Lauren Price¹, Babak Sarani¹, and Vesna Zderic¹
¹George Washington University, Washington, DC

TH-484

Light-sheet Imaging of Cardiovascular Development

Yichen Ding¹, Junjie Chen¹, Chih-Chiang Chang¹, Kyung In Baek¹, Jeffrey Hsu¹, René R. Sevag Packard¹, and Tzung K. Hsiai¹
¹University of California, Los Angeles, Los Angeles, CA

TH-485

Quantification of Heterogeneous Circumferential Strain in Healthy and Aneurysmal Aortas by DENSE MRI

John Wilson¹, Bradley Leshnowar¹, W. Robert Taylor^{1,2}, and John Oshinski^{1,2}
¹Emory University, Atlanta, GA, ²Georgia Tech / Emory University, Atlanta, GA

TH-486

Differentiating Cardiac Tissue Types Using Spectral Analysis of Raw Ultrasound Backscatter

Akhila Karlapalem¹, Amy Givan¹, Maria Fernandez-del-Valle¹, Miranda Fulton¹, and Jon Klingensmith¹
¹Southern Illinois University Edwardsville, Edwardsville, IL

TH-487

4-D Light-Sheet Imaging of Developing Heart Tubes in Zebrafish Embryos

Varun Gudapati¹, Yichen Ding¹, Adam Langenbacher¹, Chih-Chiang Chang¹, Jau-Nian Chen¹, and Tzung Hsiai¹
¹University of California Los Angeles, Los Angeles, CA

TH-488

Measuring the Effect of Mannitol on Myocardium using Optical Coherence Tomography

Tara Diba¹, Isabel Verghese¹, Sharon George¹, Jason Zara¹, and gor Efimov¹
¹The George Washington University, Washington, DC

TH-489

High-resolution Imaging of 3D Collagen Fiber Organization in Mitral Valve Using PSOCT

Leila Azinfar¹, Diane Mcconnell¹, Mohammadreza Ravanfar¹, Yuanbo Wang¹, and Gang Yao¹
¹University of Missouri, Columbia, MO

TH-490

Real Time Magnetic Resonance Imaging (RTMRI) Technique for Assessing Left Ventricular End Systolic Pressure Area Relationship and Geometry

Duc Giao^{1,2}, Yan Wang¹, Renan Rojas^{1,2}, Kiyooki Takaba^{1,2}, Anusha Badathala^{1,2}, Kimberly Spaulding^{1,2}, Gilbert Soon^{1,2}, Yue Zhang^{1,2}, Vicky Wang^{1,2}, Henrik Heraldsson¹, Jing Liu¹, David Saloner^{1,2}, Liang Ge^{1,2}, Julius Guccione^{1,2}, Arthur Wallace^{1,2}, and Mark Ratcliffe^{1,2}
¹University of California, San Francisco, San Francisco, CA, ²San Francisco VA Medical Center, San Francisco, CA

TH-491

Ultra-Structure of Endothelial Surface Glycocalyx Revealed by Stochastic Optical Reconstruction Microscopy

Jie Fan¹, Yi Sun¹, Yifan Xia¹, John Tarbell¹, and Bingmei Fu¹
¹The City College of New York, New York, NY

Thursday, October 18 | 9:30 am–5:00 pm | GWCC Exhibit Hall

Poster Viewing with Authors & Refreshment Break | 9:30 am–10:15 am and 3:00 pm–3:45 pm

TH-492

Vector Flow Imaging for Cardiovascular Applications in Pediatric Patients and Models

R. Thomas Collins II¹, Megan Laughlin², Hanna Jensen², Sean Lang³, Elijah Bolin^{4,5}, Joshua Daily^{4,5}, and Morten Jensen²
¹Stanford University School of Medicine, Stanford, CA, ²University of Arkansas, Fayetteville, AR, ³The Heart Institute, Cincinnati Children's Hospital Medical Center, Cincinnati, OH, ⁴Arkansas Children's Hospital, Little Rock, AR, ⁵University of Arkansas for Medical Sciences, Little Rock, AR

TH-493

3-Dimensional Light-Sheet Fluorescent Imaging To Characterize Doxorubicin-Induced Cardiac Injury And Notch Signaling-Dependent Regeneration

Chadi Nahal¹, Michael Chen¹, Cynthia Chen¹, Sally Tu², Jonathan Gau³, Yichen Ding¹, Junjie Chen¹, Tzung Hsiai^{1,3}, and Rene Packard³
¹Department of Bioengineering, Henry Samueli School of Engineering and Applied Sciences, University of California, Los Angeles, CA, Westwood, CA, ²Department of Neuroscience, College of Letters and Science, University of California, Los Angeles, California, Westwood, CA, ³Division of Cardiology, Department of Medicine, David Geffen School of Medicine, University of California, Los Angeles, CA, Westwood, CA

Track: Biomedical Imaging and Instrumentation, Neural Engineering**Imaging in Neuroscience and Brain Initiatives**

TH-494

Identify Local and Global Functional Connectivity Dependence on Lower Limb Motor Tasks in Stroke Survivors

Kaleb Vinehout¹, Sheila Schindler-Ivens¹, and Brian Schmit¹
¹Marquette University, Milwaukee, WI

TH-495

Typicality of Functional Connectivity Predicts Healthy Social Function

Fiona Weathersby¹, Jace King¹, Jonathan C. Fox², Amy D. Loret¹, and Jefferey Anderson¹
¹University of Utah, Salt Lake City, UT, ²Brigham Young University, Provo, UT

TH-496

3D Cultures From Rat And Human IPSC Derived Neurons Exhibit Epileptic Seizure-like Activity

Md Fayad Hasan¹, Shabnam Ghiasvand², and Yevgeny Berdichevsky^{1,2}
¹Department of Electrical and Computer Engineering, Lehigh University, Bethlehem, PA, ²Department of BioEngineering, Lehigh University, Bethlehem, PA

TH-497

Dictionary Transfer Learning for Fast Analysis of Resting State fMRI

Debadatta Dash¹, Bharat Biswal², Anil Kumar Sao³, and Jun Wang¹
¹University of Texas at Dallas, Richardson, TX, ²New Jersey Institute of Technology, Newark, NJ, ³Indian Institute of Technology, Mandi, India

TH-498

Characterizing Cognitive Memory Function in Middle-Aged and Older Adults

Julia Tang¹, Yuxuan Chen¹, Lisa De Stefano¹, Tory Worth¹, Melissa Craft², Barbara Carlson², Michael Wenger¹, Lei Ding¹, and Han Yuan¹
¹University of Oklahoma, Norman, OK, ²University of Oklahoma Health Sciences Center, Oklahoma City, OK

TH-499

Principles of Computer Numerical Control Applied to Microsurgical Procedures

Mathew Rynes¹, Leila Ghanbari¹, Jay Hu¹, Daniel Sousa Schulman¹, Gregory Johnson¹, Michael Laroque¹, and Suhasa Kodandaramaiah¹
¹University of Minnesota, Minneapolis, MN

TH-500

Language Proficiency and Executive Function An fNIRS Study

Valentina Dargam¹, Melissa Baralt¹, Ranu Jung¹, Anil Thota¹, and Liliana Rincon Gonzalez¹
¹Florida International University, Miami, FL

TH-501

Fully-Passive Wireless Recording of Neural Activation in Wistar Rats

Carolina Moncion¹, Satheesh Bojja Venkatakrishnan¹, John Volakis¹, and Jorge Riera Diaz¹
¹Florida International University, Miami, FL

TH-502

Application of Convolutional Recurrent Neural Network for Individual Identification Using Resting-state fMRI Data

Xiaoping Hu¹ and Lebo Wang¹
¹University of California, Riverside, Riverside, CA

TH-503

Network Architecture of Neurons, Astrocytes, Vasculature & Nuclei Within Cortical Brain Tissue

Jared Lechner¹ and Wei-Chiang Lin¹
¹Florida International University, Miami, FL

TH-504

Novel MRI-based Imaging of Neural Activity using MRI-compatible *In Vivo* Stimulation Electrodes

Neeta Ashok Kumar¹, Munish Chauhan¹, and Rosalind Sadleir¹
¹Arizona State University, Tempe, AZ

TH-505

A Matlab Toolbox for Multivariate Analysis of Brain Networks

Mohsen Bahrami¹, Paul Laurienti², and Sean Simpson²
¹Virginia Tech-Wake Forest School of Biomedical Engineering and Sciences, Winston-Salem, NC, ²Wake Forest School of Medicine, Winston-Salem, NC

Track: Biomedical Imaging and Instrumentation**From Diagnostics to Theranostics and Image-Guided Therapy**

TH-506

Using MRI Segmentation to Differentiate and Diagnose Glioma and Metastasis

Connor Virgile¹, Timothy Baran¹, and Edward Lin¹
¹University of Rochester, Rochester, NY

TH-507

Preclinical Testing of Targeted Multiplexing Photoacoustic Patchy Theranostic Carriers for Breast Cancer Treatment

Carolina Nino-Vargas¹, Esprit Blatchford-Rodriguez¹, Zepher Begnell¹, Rameen Khalid¹, Gregory Petrucio¹, Mikell Paige¹, and Carolina Salvador-Morales¹

¹George Mason University, Manassas, VA

Track: Biomedical Imaging and Instrumentation

Advances in Multimodal and Multiscale Imaging

TH-509

Superresolution Imaging of Mitochondrial Network through Early Pancreatic Cancer Progression

Matthew Rames¹, Lei Wu¹, Fehmi Civitci¹, Ting Zheng¹, Jason Link¹, Rosalie Sears¹, and Xiaolin Nan¹

¹OHSU, Portland, OR

TH-510

Remote Focusing Multi-photon Intravital Volumetric Microscopy

Kayvan Forouhesh Tehrani¹, William M. Southern², Emily G. Pendleton¹, Ana Maslesa¹, Jarrod Call², and Luke Mortensen^{1,2}

¹University of Georgia, Athens, GA, ²University of Georgia, Athens, GA

TH-510

Three-dimensional Imaging and Mapping of Crown-Like Structures in Intact Adipose Tissue in Obesity

Junlong Geng¹, Haichao Yu², Suma Prabhu³, Thomas Huang³, yunchao Wei³, Honghui Shi³, Kelly Swanson³, and Andrew Smith⁴

¹Beckman Institute-UIUC, Urbana, IL, ²ECE-UIUC, Urbana, IL, ³UIUC, Urbana, IL, ⁴University of Illinois Urbana Champaign, Urbana, IL

TH-511

Multiparametric Proteomic Profiling via Simultaneous Imaging of Dozens of Markers in Tissue Samples

Joseph Kim¹, Pieter Noordam¹, Pascual Starink¹, Jaskirat Singh¹, Gajalakshmi Dakshinamoorthy¹, and Julia Kennedy-Darling¹

¹Akoya Biosciences, Menlo Park, CA

Track: Biomedical Imaging and Instrumentation

Nuclear Medicine Imaging (PET/SPECT)

TH-512

A Novel Significant Based CAD System of Alzheimer's Disease using 11C PIB-PET Scans

Fatma El-zahraa Elgama^{1,2}, Mohammed Elmogy², Hassan Soliman¹, Ahmed Atwan¹, Mohammed Ghazal^{2,3}, Gregory Barnes⁴, Robert Keynton², and Ayman El-Baz²

¹Faculty of Computers and Information, Mansoura University, Mansoura, Egypt, ²University of Louisville, Louisville, KY, ³Abu Dhabi University, Abu Dhabi, United Arab Emirates, ⁴University of Louisville Autism Center, University of Louisville, Louisville, KY

TH-513

Imaging Synaptic Density in the Developing Nonhuman Primate Brain Using 11C-UCB-J PET

Samantha Rossano¹, Krista Fowles¹, Daniel Holden¹, Steven R. Wilson¹, Jennifer Asher¹, Helene Benveniste¹, Manuel Fontes¹, and Richard Carson¹

¹Yale University, New Haven, CT

Track: Biomedical Imaging and Instrumentation

Optical Imaging, Microscopy and Spectroscopy (Optics)

TH-514

Two-stage Local Outlier Factor for Multivariate Identification of Outliers in Optical Spectroscopy and Imaging

Yu Sun¹, Miki Haifler^{1,2}, Brandon Harrison¹, Alexander P. Dumont¹, and Chetan A. Patil¹

¹Temple University, Philadelphia, PA, ²Temple Health-Fox Chase Cancer Center, Philadelphia, PA

TH-515

Spatial Frequency Domain Imaging of Pressure Induced Skin Injury and Chronic Wounds

Jeffrey Chen¹, Justin Nguyen¹, Damian Torres¹, Eddy Salas¹, Rachel Thompson¹, Rolf Saager¹, Rebecca Rowland¹, Robert Wilson¹, and Anthony Durkin¹

¹University of California, Irvine, Irvine, CA

TH-516

Low Cost Low Complexity Lifetime Imaging via Night Vision Intensifier

Samer Habeel¹ and Joe Lo¹

¹University of Michigan at Dearborn, Dearborn, MI

TH-517

Custom Built Fiber Amplifier and Diamond Raman Laser as Alternative Multiphoton Microscopy Sources

Shaun Engelmann¹, Ahmed Hassan¹, Jeremy Jarrett¹, Evan Perillo¹, David Miller¹, and Andrew Dunn¹

¹University of Texas at Austin, Austin, TX

TH-518

Structural Changes in Cardiac Myosin Filaments Detected by Polarization-Resolved Second Harmonic Generation Microscopy

Cai Yuan¹, Catalin Baicu², Amy Bradshaw², Michael Zile², Thomas Borg², and Bruce Gao¹

¹Clemson University, Clemson, SC, ²Medical University of South Carolina, Charleston, SC

TH-519

Classification of Ovarian Cancers Using a Hybrid Photoacoustic/Ultrasound System

Eghbal Amidi¹, Atahar Mostafa¹, Sreyankar Nandy¹, and Quing Zhu^{1,2}

¹Washington university in St. Louis, St. Louis, MO, ²Mallinckrodt Institute of Radiology, Washington University School of Medicine, St. Louis, MO

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TH-520

Advances in Raman Monte Carlo Modeling using a GPU Accelerated PlatformAlexander Dumont¹ and Chetan Patil¹
¹Temple University, Philadelphia, PA

TH-521

Label-free SERS Platforms for Rapid Screening and Identification of Biologics and Drugs of AbuseSoumik Siddhanta¹, Santosh Paidi¹, Maciej Wróbel², and Ishan Barman¹
¹Johns Hopkins University, Baltimore, MD, ²Gdansk University of Technology, Gdansk, Poland

TH-522

An Affordable Smartphone Whole Slide Scanner for Digital PathologyHanyang Huang¹, Ye Niu¹, Anil Parwani¹, and Yi Zhao¹
¹The Ohio State University, Columbus, OH

TH-523

Monitoring of Muscle Hemodynamics during Exercise Using Hybrid Near-infrared Spectroscopy and Diffuse Correlation Spectroscopy in Older AdultsMingjun Zhao¹, Danielle Jones¹, D. Travis Thomas¹, and Guoqiang Yu¹
¹University of Kentucky, Lexington, KY

TH-524

3D Imaging of Optically Cleared Tissue Using On-Chip MicroscopyYibo Zhang¹, Yoonjung Shin¹, Kevin Sung¹, Sam Yang¹, Harrison Chen¹, Hongda Wang¹, Da Teng¹, Yair Rivenson¹, Rajan Kulkarni¹, and Aydogan Ozcan¹
¹University of California, Los Angeles, Los Angeles, CA

TH-525

High Density-Diffuse Optical Tomography of the Human Motor CortexDaniel Cheong¹, Fan Zhang¹, and Han Yuan¹
¹University of Oklahoma, Norman, OK

TH-526

FPGA Analyzer in Diffuse Correlation SpectroscopyWei Lin¹, Chia Chieh Go¹, David Busch², Arjun Yodh³, and Thomas Floyd²
¹Stony Brook University, Stony Brook, NY, ²UT Southwestern Medical Center, Dallas, TX, ³University of Pennsylvania, Philadelphia, PA

TH-527

Concurrent Photoacoustic and Ultrasound Microscopy with a Coaxial Dual-Element Ultrasonic TransducerYuqi Tang¹, Wei Liu¹, Yang Li², Qifa Zhou², and Junjie Yao¹
¹Duke University, Durham, NC, ²University of Southern California, Los Angeles, CA

TH-528

Robust, Quantitative Bright Field Imaging Using Physical PrinciplesNicholas Schaub^{1,2}, Nathan Hotaling³, Kapil Bharti³, and Carl Simon²
¹University of Michigan, Ann Arbor, MI, ²National Institute of Standards and Technology, Gaithersburg, MA, ³National Institutes of Health, Bethesda, MA

TH-529

Investigation of 1064-nm Laser Fluence within Tissue Phantoms for Better Understanding of Transcranial PhotobiomodulationTyrell Pruitt¹, Hasan Parvez¹, and Hanli Liu¹
¹University of Texas at Arlington, Arlington, TX

TH-530

Investigation of Acute Radiation-induced Changes in Oxygenation in a Murine Breast Tumor ModelAlaa Abdelgawad¹, Sina Dadgar¹, and Narasimhan Rajaram¹
¹University of Arkansas, Fayetteville, AR

TH-531

Discovery of Two-Photon and Aggregation-Induced Emission Probe for Mitochondria ImagingGaocan Li¹, Weihua Zhuang¹, and Yunbing Wang¹
¹Sichuan University, Chengdu, China, People's Republic of

TH-532

Quantitative Drug Resistance Detection Via Spectroscopic Photon Localization MicroscopyJanel Davis¹, Biqin Dong², Yang Zhang², Cheng Sun², and Hao Zhang²
¹Northwestern University, Chicago, IL, ²Northwestern University, Evanston, IL

TH-533

Focus Tracking in Tissue Pathology With Multichannel Confocal MicroscopyJuehyung Kang¹, Incheon Song², Hongrae Kim³, Hyunjin Kim³, Sunhye Lee³, Yongdoo Choi³, Hee Jin Chang³, Dae Kyung Sohn³, Byung-Seon Chun⁴, and Hongki Yoo¹
¹Hanyang University, Seoul, Korea, Republic of, ²Nanoscope Systems Inc., Daejeon, Korea, Republic of, ³National Cancer Center, Goyang, Korea, Republic of, ⁴Nanoscope Systems Inc., Goyang, Korea, Republic of

TH-534

Motion-Corrected Multimodality Volumetric Ophthalmic Imaging using Spectrally Encoded Coherence Tomography and Reflectometry (SECTR)Yuankai Tao¹, Mohamed El-Haddad¹, Joseph Malone¹, Ivan Bozic¹, Kelsey Leeburg¹, and Benjamin Terrones¹
¹Vanderbilt University, Nashville, TN**Track: Biomedical Imaging and Instrumentation****X-ray and Computed Tomographic Imaging (CT)**

TH-535

3D Quantitative Analysis of Craniofacial Abnormalities in Mice Embryos Exposed to Electronic Cigarette Aerosol MixturesSuraj Kandaram¹, Omprakash Lankalappalli¹, Jefferson Overlin¹, and Rene Olivares-Navarrete¹
¹Virginia Commonwealth University, Richmond, VA

TH-536

Effect of Low-Dose X-Ray Radiation on Endothelial Cells *In Vitro*

Justin Napolitano¹, Aniq Chowdhury¹, Suzanne Bradley¹, Leon Zheng¹, Donald Medlin¹, Endre Takacs¹, and Delphine Dean¹
¹Clemson University, Clemson, SC

TH-537

Methods for Generating and Viewing CT images Containing Multiple Kernels, Slice Thicknesses, and Display Settings

Brandon Nelson¹, Kent Thielen¹, and Cynthia McCollough¹
¹Mayo Clinic, Rochester, MN

TH-538

Efficient Multi-Modality Medical Image Joint Reconstruction via Vectorized Gradient

Yun Liang¹, Yao Xiao¹, Yunmei Chen¹, Xiaojing Ye², and Ruogu Fang¹
¹University of Florida, Gainesville, FL, ²Georgia State University, Atlanta, GA

TH-539

CT Monitoring of Changes in Brain Perfusion Caused by Hypothermic Saline Flow Treatment of the Head and Neck

Gregory Michalak¹, Seth Rodgers², Tom Kreck², Ramanathan Kadirvel¹, Cynthia McCollough¹, and David Kallmes¹
¹Mayo Clinic, Rochester, MN, ²NeuroSave Inc., San Francisco, CA

TH-540

Integration of Imaging based Markers and Clinical Biomarkers for Early Detection of Lung Cancer

Ahmed Shaffie¹, Ahmed Soliman¹, Victor Van Berkel¹, Neal Dunlap¹, Brian Wang¹, Mohammed Ghazal¹, Georgy Gimel'farb², Xiao-An Fu¹, Michael Nantz¹, Guruprasad Giridharan¹, and Ayman El-Baz¹
¹University of Louisville, Louisville, KY, ²University of Auckland, Auckland, New Zealand

Track: Biomedical Imaging and Instrumentation, Biomechanics

Imaging Techniques in Biomechanics

TH-541

Anisotropic Composite Material Phantom to Improve Skeletal Muscle Characterization Using Magnetic Resonance Elastography

Martina Guidetti¹, Gloria Lorgna², Margaret Hammersley³, Dieter Klatt¹, Pasquale Vena², Ramille Shah³, and Thomas J. Royston¹
¹University of Illinois at Chicago, Chicago, IL, ²Politecnico di Milano, Milan, Italy, ³Northwestern University, Chicago, IL

TH-542

Three-dimensional, Biomechanical Characterization of Localized Corneal Collagen Crosslinking via Brillouin Microscopy

Joshua Webb¹ and Giuliano Scarcelli¹
¹University of Maryland, College Park, MD

TH-543

Validation of Stereo-Digital Image Correlation for Full Field Analyses of Mouse Aortas in Aqueous Media

Brooks Lane¹, Xiaoying Wang², Susan Lessner^{1,3}, Michael Sutton¹, Narendra Vyavahare², and John Eberth^{1,3}
¹University of South Carolina, Columbia, SC, ²Clemson University, Clemson, SC, ³University of South Carolina School of Medicine, Columbia, SC

TH-544

Simultaneous 2D Strain and Structural Analysis of Collagenous Tissues Using Polarized Spatial Frequency Domain Imaging

Samuel Potter¹, Will Goth¹, James Tunnell¹, and Michael Sacks¹
¹University of Texas at Austin, Austin, TX

TH-545

Ultrasound-based Observations of Apparent Achilles Tendon Shortening

Allison McCrady¹, Erika Kasen¹, and Laura C. Slane¹
¹Trine University, Angola, IN

Track: Biomedical Imaging and Instrumentation, Translational Biomedical Engineering

Imaging Technologies in Clinical Translation

TH-546

Longitudinal Imaging Device Created for Preclinical Studies in a Model of Traumatic Brain Injury

Chelsea Pernici¹ and Teresa Murray¹
¹Louisiana Tech University, Ruston, LA

TH-547

Computer-Aided Design (CAD) Development and 3-Dimensional Printing to Produce a Laryngeal Cleft Model

Kimberly Cabrera¹, Allison Powell^{2,3}, Sudharsan Srinivasan^{2,3}, and David Zopf⁴
¹University of Michigan Engineering, Ann Arbor, MI, ²University of Michigan Medical School, Ann Arbor, MI, ³University of Michigan Biomedical Engineering, Ann Arbor, MI, ⁴University of Michigan Department of Otolaryngology Head and Neck Surgery, Ann Arbor, MI

TH-548

Reproducibility of Free Water in Parkinson's Disease

Winston Chu¹, Derek Archer¹, Roxana Burciu¹, Song Lai¹, Samuel Wu¹, Michael Okun¹, Nikolaus McFarland¹, and David Vaillancourt¹
¹University of Florida, Gainesville, FL

TH-549

Ultrasound-Induced Insulin Release

Tania Singh¹, Shane Haar¹, Tyler Salvador², Hyunji Kim¹, Dunya Karimi¹, Diti Chatterjee Bhowmick¹, Ivan Suarez Castellanos³, Joshua Cohen⁴, Kevin Cleary², Aleksandar Jeremic¹, and Vesna Zderic¹
¹The George Washington University, Washington, DC, ²Children's National Medical Center, Washington, DC, ³INSERM, Lyon, France, ⁴GW Medical Faculty Associates, Washington, DC

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TH-550

New Protocols for Imaging Ultrasound Effects on the PancreasAndrew Chen¹, Tania Singh¹, Diti Chatterjee Bhowmick¹, Aleksandar Jeramic¹, and Vesna Zderic¹¹The George Washington University, Washington, DC

TH-551

Accurate Diagnosis of Diabetic Retinopathy Using Convolutional Neural NetworksMohamed Shaban¹, Zeliha Ogur², Ali Aslantas², Ali Mahmoud², Ahmed Shalaby³, Mohammed Ghazal³, Harpal Sandhu³, Henry Kaplan³, and Ayman El-Baz³¹Southern Arkansas University, Arkansas, AR, ²University of Louisville, Louisville, KY, ³UofL, Louisville, KY

TH-552

Design and Manufacturing of a 3D printed, Low-Cost, High-Fidelity Cleft Palate SimulatorNatalie Halphen¹, Allison Powell¹, and Sudharsan Srinivasan¹¹University of Michigan, Ann Arbor, MI

TH-553

Real-Time Mosaicking of Thick Tissue Using Structured Illumination Microscopy and HiLo MicroscopySiyang Hu¹ and J. Quincy Brown¹¹Tulane University, New Orleans, LA

TH-554

Near Infrared Fluorescence Image Guidance System for Thoracic Duct Visualization During Pediatric Cardiac SurgeryChris Hansen¹, Jaidip Jagtap¹, Gayatri Sharma¹, Abdul Parchur¹, Kenneth Allen¹, Ron Woods¹, Viktor Hraska¹, and Amit Joshi¹¹Medical College of Wisconsin, Milwaukee, WI

TH-555

Intraoperative 3D Imaging of Blood Flow Distributions in Mastectomy Skin Flaps using Noncontact Speckle Contrast Diffuse Correlation TomographySiavash Mazdeyasna¹, Chong Huang¹, Mingjun Zhao¹, Nneamaka Agochukwu¹, Ahmed Bahrani¹, Lesley Wong¹, and Guoqiang Yu¹¹University of Kentucky, Lexington, KY

TH-556

Design, Development and Cadaveric Validation of a Minimally Invasive Theranostic Device for Ablative Neuro-OncologyNao Gamo¹, Rajiv Iyer¹, Stephen Restaino², Kyle Morrison³, Alan Cohen¹, Henry Brem¹, Mari Groves¹, and Amir Manbachi¹¹Johns Hopkins University, Baltimore, MD, ²Maryland Development Center, Baltimore, MD, ³Sonic Concepts Inc., Seattle, WA

TH-557

Spatially Resolved Metagenomics to Create Micron-scale Maps of Microbial CommunitiesHao Shi¹, Ilana Brito¹, and Iwijn De Vlaminc¹¹Cornell University, Ithaca, NY

TH-558

Guiding Fluorescence-Augmented Imaging System for Breast Cancer SurgeryMaria Leiloglou¹, Ji Qi¹, Daniel Rees Whippey², Angharad Curtis², Chris Price², Nigel Copner², Paula Martin-Gonzalez¹, George Hanna¹, Ara Darzi¹, Daniel R. Leff¹, and Daniel S. Elson¹¹Imperial College London, London, United Kingdom, ²Cymtec Ltd, Astrid Mynach, United Kingdom

TH-559

Changes of Brain Connectivity Among Different Human Vigilance States Investigated by EEGYudhajit Das¹, Xinlong Wang¹, Olajide Babawale¹, Thien Nguyen², Mark Gladwin¹, and Hanli Liu¹¹University of Texas at Arlington, Arlington, TX, ²Gwangju Institute of Science and Technology, Gwangju, Korea, Republic of**Track: Biomedical Imaging and Instrumentation, Respiratory Bioengineering****Imaging the Respiratory System (*Imaging)**

TH-560

Neutrophil Extracellular Traps Promote Lung Vaso-occlusion in Sickle Cell DiseaseRavi Vats¹, Tomasz Brzoska¹, Maritza Montanez¹, Egemen Tutuncuoglu¹, Tirhadipa Pradhan-Sundd¹, Jesus Tejero¹, Mark Gladwin¹, and Prithu Sundd¹¹University of Pittsburgh, Pittsburgh, PA**Track: Biomedical Imaging and Instrumentation, Tissue Engineering****Imaging Techniques in Tissue Engineering**

TH-561

Indirect Assessment of Implant Revascularization Using Near-Infrared Oximetry and Diffuse Correlation SpectroscopyAshley Dacy¹, Hanli Liu¹, Kytai Nguyen¹, and Liping Tang¹¹University of Texas at Arlington, Arlington, TX**Track: Tissue Engineering****Immunoengineering and Immunomodulation in Tissue Engineering**

TH-562

The Effect of Manuka Honey on Neutrophil Factor Release Under Various Environmental ConditionsBenjamin Minden-Birkenmaier¹, Richard Smith², Marko Radic², and Gary Bowlin¹¹University of Memphis, Memphis, TN, ²University of Tennessee, Memphis, TN

TH-563

Tissue-Engineered Stromal Reticulum to Study the Role of Lymph Node Fibroblastic Reticular Cell Networks in Autoimmune DiabetesFreddy Gonzalez Badillo^{1,2}, Shane Wright^{1,2}, Mackenzie Scully^{1,2}, Nicholas DeAngelis^{1,2}, and Alice Tomei^{1,2}¹Diabetes Research Institute, Miami, FL, ²Department of Biomedical Engineering-University of Miami, Coral Gables, FL

TH-564

3D Bioengineered Model of Inflammatory Bowel Disease

Terrence Roh¹, Ying Chen¹, and David Kaplan¹
¹Tufts University, Medford, MA

TH-565

Allogeneic Ovarian Tissue Encapsulated in Synthetic and Membrane Immunoisolators Restores Endocrine Function in Ovariectomized Mice

Anu David¹, James Day¹, Mayara Barbosa¹, Marilia Cascalho¹, and Ariella Shikanov¹
¹University of Michigan, Ann Arbor, MI

TH-566

Secretome Analysis of Macrophages Treated with Hemoglobin-Haptoglobin Complexes

Paulina Krzyszczyk¹, Kishan Patel¹, Maurice O'Reggio¹, Kristopher Richardson², Martin Yarmush¹, Andre Palmer², and Francois Berthiaume¹
¹Rutgers University, Piscataway, NJ, ²Ohio State University, Columbus, OH

TH-567

Encapsulation of C3d Producing Cells in a Dual Poly(ethylene glycol) Capsule Enhances Anti-tumor Immunity Against the Onset of Multiple Myeloma

James Day¹, Anu David¹, Mayara Barbosa¹, Marilia Cascalho¹, and Ariella Shikanov¹
¹University of Michigan, Ann Arbor, MI

TH-568

Defining the Immune Response to Resveratrol Releasing Polymer Scaffolds Implanted in Adipose Tissue

Kendall Murphy¹ and Michael Gower¹
¹University of South Carolina, Columbia, SC

TH-569

Engineered Skin Substitutes for the Controlled Delivery of SDF-1 α to Modulate Macrophage Polarization

Justine Yu^{1,2,3} and John Fisher^{1,3}
¹University of Maryland, College Park, College Park, MD, ²University of Maryland School of Medicine, Baltimore, MD, ³Center for Engineering Complex Tissues, College Park, MD

TH-570

Immunomodulatory Microcarriers Accelerate Bone Healing in Diabetes Condition

Zhai Hu¹ and Xiaohua Liu¹
¹Texas A&M University College of Dentistry, Dallas, TX

TH-571

3D Biomaterial Matrix to Support Long Term, Full Thickness, Immuno-competent Human Skin Equivalents with Nervous System Components

Sarah Lightfoot Vidal¹, Kasey Tamamoto¹, Hanh Nguyen¹, Rosalyn Abbott², Dana Cairns¹, and David Kaplan¹
¹Tufts University, Medford, MA, ²Carnegie Mellon University, Pittsburgh, PA

TH-572

Functionalization of Brain Region-specific Organoids with Isogenic Microglia-like Cells

liqing Song¹, Xuegang Yuan¹, Zachary Jones¹, Kyle Griffin¹, Yu Miao¹, Jingjiao Guan¹, Teng Ma¹, Yi Zhou¹, and Yan Li¹
¹Florida State University, Tallahassee, FL

Track: Cellular and Molecular Bioengineering

Immunoengineering

TH-573

Galectin-3 Anchored Indoleamine 2,3-Dioxygenase Ameliorates Periodontal Disease

Sabrina Freeman¹, Evelyn Bracho-Sanchez¹, Fernanda Rocha¹, Shaheen Farhadi¹, Shannon Wallet¹, Gregory Hudalla¹, and Benjamin Keselowsky¹
¹University of Florida, Gainesville, FL

TH-574

Microscale Methods for Investigating CRISPR Generated CAR T Cell Killing Efficacy

Nicole Piscopo¹, Katherine Mueller¹, Amritava Das¹, Yasmin Alvarez-Garcia¹, David Beebe¹, Christian Capitini¹, and Kris Saha¹
¹University of Wisconsin-Madison, Madison, WI

TH-575

Identification of Macrophage Polarization Dynamics for Closed Loop Control of Inflammation

Laura Weinstock¹, James Forsmo¹, Alexis Wilkinson¹, and Levi Wood¹
¹Georgia Institute of Technology, Atlanta, GA

TH-576

High-sensitivity Detection of Stem Cell Secretome using Immuno-disaggregation Bioassays

Pawan KC¹, Fan Liu¹, Jiang Zhe¹, and Ge Zhang¹
¹University of Akron, Akron, OH

TH-577

Influenza Infection Alters Skeletal Muscle Inflammatory Milieu to a Greater Degree in Aged Mice

Ronak Mahatme^{1,2}, Spencer Keilich², Jenna Bartley², and Laura Haynes²
¹Johns Hopkins University, Baltimore, MD, ²University of Connecticut Health Center, Farmington, CT

TH-578

Environmentally Responsive RIG-I Prodrugs: Design and Considerations

Christian Palmer¹, Max Jacobson¹, Olga Fedorova², Anna Pyle², and John Wilson¹
¹Vanderbilt University, Nashville, TN, ²Yale University, New Haven, CT

TH-579

Investigating the Effects of Homotypic Paracrine Signaling in Macrophage Activation

Ssu-Chieh Hsu¹ and Wendy Liu¹
¹University of California-Irvine, Irvine, CA

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TH-580

Engineering Multi-Epitopic Antibodies for Receptor DownregulationSeth Ludwig¹, Rakeeb Kureshi¹, and Jamie Spangler¹
¹Johns Hopkins University, Baltimore, MD

TH-581

Engineering a Magnetized Natural Killer Cell Biohybrid as a Nanoimmunotherapy for Solid TumorsRachel Burga^{1,2}, C. Russell Y. Cruz^{1,2}, Catherine M. Bollard^{1,2}, and Rohan Fernandes¹
¹George Washington University, Washington, DC, ²Children's National Health System, Washington, DC

TH-582

Macrophage Polarization and Reprogramming Using ECM Nanoparticles in Experimental Lung InjuryMichael Valentine¹, Patrick Link¹, Franck Kamga Gninzeko¹, Manav Parekh¹, Alexandria Ritchie¹, Gabrielle Cotman¹, Angela Reynolds¹, and Rebecca Heise¹
¹Virginia Commonwealth University, Richmond, VA**Track: Tissue Engineering****Integration of Developmental Biology and Morphogenesis in Tissue Engineering**

TH-583

Ectopic Sources of Fibroblast Growth Factor 10 Induce Supernumerary Buds in Cultured Embryonic LungsKara Peak¹ and Victor Varner¹
¹University of Texas at Dallas, Richardson, TX

TH-584

Cardiac ECM Developmental Age and Cyclic Stretch Synergistically Improve Twitch Force in Engineered Cardiac TissuesMark Daley¹, Matthew Watson¹, Luke Perreault¹, Ross Bretherton¹, Whitney Stoppel¹, and Lauren Black¹
¹Tufts University, Medford, MA**Track: Tissue Engineering, Cellular and Molecular Bioengineering****Mechanobiology in Cell and Tissue Engineering**

TH-585

Aspiration-ejection Creates an *In Vitro* Model to Study Cancer Cell MechanobiologyRuby Huynh¹, Alexa Guittari¹, Manal Yousof¹, Bidhan Bandyopadhyay², Xiaolong Luo³, and Christopher Raub¹
¹Department of Biomedical Engineering, The Catholic University of America, Washington, DC, ²Research Service, Veterans Affairs Medical Center, Washington, DC, ³Department of Mechanical Engineering, The Catholic University of America, Washington, DC

TH-586

Inhibited LINC Complex in Osteoblasts Enhances Differentiation in Response to Osteogenic NanoenvironmentsKatherine Kloecker¹, Otto Juhl IV¹, Daniel Conway¹, and Henry Donahue¹
¹Virginia Commonwealth University, Richmond, VA

TH-587

Engineering Optimal Chemo-Mechanical Substrates for Human Liver Cell CultureChase Monckton¹, David Kukla¹, Aidan Brougham-Cook², Erika Ferarri¹, Gregory Underhill², and Salman Khetani¹
¹University of Illinois at Chicago, Chicago, IL, ²University of Illinois at Urbana-Champaign, Champaign, IL

TH-588

PEG Hydrogel Degradation Mechanism and Rate Impacts Adventitial Fibroblast PhenotypeKaryn Robinson¹, Rebecca Scott^{1,2}, Robert Akins¹, and Kristi Kiick²
¹Nemours-Alfred I. duPont Hospital for Children, Wilmington, DE, ²University of Delaware, Newark, DE

TH-589

Protocol Development to Measure the Concentration of Cell Free Nucleic Acid in MinipigsKatrina Colucci-Chang¹, Elizabeth McNeil¹, and Pamela VandeVord^{1,2}
¹Virginia Polytechnic Institute and State University, Blacksburg, VA, ²Veteran Affairs Medical Center, Salem, VA

TH-590

Tissue Engineered 3D Construct for Modeling Ductus Arteriosus ClosureBrian O'Grady¹, Courtney Berger², Jeff Reese², Leon Bellan¹, and Elaine Shelton²
¹Vanderbilt University, Nashville, TN, ²Vanderbilt Medical Center, Nashville, TN**Track: Cardiovascular Engineering, Biomechanics****Mechanobiology of Cardiac and Smooth Muscle**

TH-591

Imbalance in Reactive Oxygen and Nitrogen Species lead to Impaired Contractility and Remodeling of Collecting Lymphatic VesselsZhanna Nepiyushchikh¹, Anish Mukherjee¹, Mohammad Razavi¹, and Brandon Dixon¹
¹Georgia Institute of Technology, Atlanta, GA

TH-592

Adhesion Strength Shows Clonal Heterogeneity Associated with Non-Coding Locus in iPSC-Derived Smooth Muscle CellsJaimie Mayner¹, Aditya Kumar¹, Pranjali Beri¹, Jesse Placone¹, Aki Torkamani², Kristin Baldwin³, and Adam Engler¹
¹UCSD, La Jolla, CA, ²Scripps Translational Science Institute, La Jolla, CA, ³The Scripps Research Institute, La Jolla, Afghanistan

Track: Biomechanics

Mechanobiology of Cell Adhesion

TH-593

CD11c Affinity Modulates Mon2 Recruitment and Adoption of a Pro-inflammatory Phenotype Correlating with Increased Risk of Myocardial Infarction

Alfredo Hernandez¹ and Scott Simon¹
¹UC Davis, Davis, CA

TH-594

On the Measurement of Energy Dissipation of Adherent Cells with Quartz Crystal Microbalance with Dissipation Monitoring

Amir Monemian Esfahani¹ and Ruiguo Yang¹
¹University of Nebraska-Lincoln, Lincoln, NE

TH-595

Is Cell Alignment Modulated by Cell-Matrix Interaction or Cell-Cell Interaction?

Stephen Coyle¹, Micheal Grigola¹, Philip LeDuc¹, and Jimmy Hsia¹
¹Carnegie Mellon University, Pittsburgh, PA

TH-596

Cortical Actin Cytoskeleton Regulates Cadherin Mediated Cell-Cell Adhesion

Ramesh Koirala¹, Andrew V. Priest¹, Chi-Fu Yen¹, and Sanjeevi Sivasankar¹
¹Iowa State University, Ames, IA

TH-597

Biomimetic E-cadherin Adhesion Interface Identifies E-cadherin Mechanosensitivity to Epithelial Cell Stiffness

Siddharth Chatterji¹ and Venkat Maruthamuthu¹
¹Old Dominion University, Norfolk, VA

Track: Stem Cell Engineering

Mechanobiology of Stem Cell Engineering

TH-598

Cortical Compaction in 3D Aggregates Induces Metabolic Reprogramming Through Release of Aldolase A

Brent Bijonowski¹, Susan Daraiseh¹, Xuegang Yuan¹, and Teng Ma¹
¹Florida State University, Tallahassee, FL

TH-599

Investigating The Utility Of Human Neural Progenitor Cells As Reliable Indicators of Neurotoxicity And Biophysical Changes Under Toxicant-Aberrant Conditions

Gautam Mahajan¹, Moo-Yeal Lee¹, and Chandra Kothapalli¹
¹Cleveland State University, Cleveland, OH

TH-600

Nuclear Morphology Determines Stem Cell Fate

Xinlong Wang¹, Vasundhara Agrawal¹, Chongwen Duan¹, Vadim Backman¹, and Guillermo Ameer¹
¹Northwestern University, Evanston, IL

Track: Biomechanics

Mechanobiology of the Vascular and Nervous System

TH-601

Substrate Stiffness and Composition Regulate Endothelial Cell Biomechanics

Nick Merna¹, Christine Crosfield¹, Victor Barahona¹, Cydnee Bacci¹, and Sina Rabbany^{1,2}
¹Hofstra University, Hempstead, NY, ²Weill Cornell Medicine New York, NY

Track: Biomechanics

Topics in Mechanobiology

TH-602

Quantifying Lumbar Musculature and Adipose Tissue Changes with Spaceflight using qCT Analysis

Katelyn Greene^{1,2}, Kyle McNamara^{1,2}, Austin Moore^{1,2}, Nisha Subramanian^{2,3}, Lisa Maez², and Ashley Weaver^{1,2}
¹Wake Forest School of Medicine, Winston-Salem, NC, ²Virginia Tech-Wake Forest School of Biomedical Engineering and Sciences, Winston-Salem, NC, ³University of California, Berkeley, Berkeley, CA

TH-603

Cardiac Contractility and Hemodynamics Regulate Cardiac Valve Leaflet Development via Notch1b in an Embryonic Model

Jeffrey Hsu¹, Vijay Vedula², Kyung Baek¹, Yichen Ding¹, Chih-Chiang Chang¹, Yin Tintut¹, Linda Demer¹, Alison Marsden², and Tzung Hsiai¹
¹UCLA, Los Angeles, CA, ²Stanford University, Stanford, CA

TH-604

High-throughput Mechanotransduction in Drosophila with a Microfluidic Device

Ardon Shorr¹, Utku Sönmez¹, Jon Minden¹, and Philip LeDuc¹
¹Carnegie Mellon University, Pittsburgh, PA

TH-605

Biophysical Phenotyping of the Cytotoxicity of Environmental Pollutants

Peiran Zhu¹, Xiaofei Song², and Yubing Sun¹
¹University of Massachusetts Amherst, Amherst, MA, ²South China University of Technology, Guangzhou, China, People's Republic of

Track: Cancer Technologies

Metastasis, Dormancy & Treatment Response

TH-606

Synthetic Poly(ethylene glycol) Matrix Confines Cancer Cells and Prevents their Reintroduction Following Ovarian Tissue Autotransplantation

Anu David¹, James Day¹, Catherine Long¹, and Ariella Shikanov¹
¹University of Michigan, Ann Arbor, MI

TH-607

Multifunctional Drug Resistance Triggered by Creep Under 3D Confinement

Qionghua Shen¹, Loan Bui², Rami Barakat¹, Tamara Hill¹, James Battiste³, and Young-tae Kim¹
¹University of Texas at Arlington, Arlington, TX, ²University of Notre Dame, Notre Dame, IN, ³University of Oklahoma Health Science Center, Oklahoma, OK

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Poster Viewing with Authors & Refreshment Break | 9:30 am–10:15 am and 3:00 pm–3:45 pm

TH-608

Fluid Shear Stress Causes Resistance to Chemotherapy Drugs Doxorubicin and Paclitaxel in Breast CancerUrsula Triantafyllou¹ and Yonghyun Kim¹¹The University of Alabama, Tuscaloosa, AL

TH-609

HIFU Re-sensitizes Tamoxifen-resistant Breast Cancer in Preclinical and Patient-derived Xenograft ModelsDamir Khismatullin¹, Hakm Murad¹, Rachel Sabol¹, Shirley Hong¹, Emma Bortz¹, Charles Kelly¹, Matthew Burow¹, and Bruce Bunnell¹¹Tulane University, New Orleans, LA

TH-610

Capturing Microenvironmental Regulation of Disseminated Human Tumor Cells using Implantable Humanized Pre-metastatic NichesRyan Carpenter¹ and Jungwoo Lee¹¹University of Massachusetts Amherst, Amherst, MA

TH-611

Tissue Architectural Cues and Differential Extravasation Patterns Drive the Non-random Trafficking of Tumor Cells in Larval ZebrafishColin Paul¹, Kevin Bishop², Alexis Devine¹, William Wulfstange³, Elliott Paine¹, Jack Staunton¹, Steven Shema¹, Val Bliskovsky¹, Lisa Miller Jenkins¹, Nicole Morgan³, Raman Sood², and Kandice Tanner¹¹National Cancer Institute, Bethesda, MD, ²National Human Genome Research Institute, Bethesda, MD, ³National Institute of Biomedical Imaging and Bioengineering, Bethesda, MD

TH-612

Silica Gel Encapsulation as a Tool to Identify Dormant and Chemoresistant Ovarian Cancer CellsTiffany Lam¹, Hak Rae Lee¹, Melissa Geller¹, Alptekin Aksan¹, and Samira Azarin¹¹University of Minnesota Twin Cities, Minneapolis, MN

TH-613

Role for Thromboxane A2 Receptor in Platelet-Assisted Breast Cancer MetastasisThomas Werfel¹, Matt Duvernay², Robert Lavieri², Jae Maeng², Donna Hicks¹, Bushra Rahman¹, Jess Roetman¹, Mellissa Nixon², David Elion¹, Shan Wang², Dana Brantley-Sieders², Justin Balko², Heidi Hamm², and Rebecca Cook¹¹Vanderbilt University, Nashville, TN, ²Vanderbilt University Medical Center, Nashville, TN

TH-614

Aldolase B-Mediated Fructose Metabolism Drives Metabolic Reprogramming of Colon Cancer Liver MetastasisKun Xiang¹, Pengcheng Bu^{1,2}, Kai-Yuan Chen¹, Christelle Johnson³, Scott B. Crown¹, Mark Herman¹, David Hsu¹, Guo-Fang Zhang¹, and Xiling Shen¹¹Duke University, Durham, NC, ²Chinese Academy of Sciences, Beijing, China, People's Republic of, ³Cornell University, Ithaca, NY

TH-615

Tunable PEG-Based Hydrogels to Control Breast Cancer Cell FateShantanu Pradhan¹ and John Slater¹¹University of Delaware, Newark, DE

TH-616

Modeling Adaptive Resistance of Colon Cancer to Targeted Therapies Using Tumor SpheroidsPradip Shahi Thakuri¹, Megha Gupta¹, Gary Luker², and Hossein Tavana¹¹University of Akron, Akron, OH, ²University of Michigan, Ann Arbor, MI

TH-617

Physical and Biochemical Gradients in the Tumor Microenvironment Cooperate to Drive Local Invasion and MetastasisMadeleine Oudin¹, Oliver Jonas², Tatiana Kosciuk², Andrew Riching³, Miles Miller², Jeff Wyckoff², Michael Cima², Doug Lauffenburger², Patricia Keely³, and Frank Gertler²¹Tufts University, Medford, MA, ²MIT, Cambridge, MA, ³University of Wisconsin-Madison, Madison, WI

TH-618

Follicular Fluid Increases Cell Aggregation and Apoptosis Resistance to Promote Metastasis in Ovarian CancerAndrew Fleszar¹, Will Flanigan¹, and Pamela Kreeger¹¹University of Wisconsin-Madison, Madison, WI

TH-619

Substratum Stiffness Regulates Cancer Cell Dormancy and AutophagyAlisya Anlas¹ and Celeste Nelson¹¹Princeton University, Princeton, NJ**Track: Cancer Technologies****Tumor Microenvironment**

TH-620

Heparin Hydrogel as a Biomimetic Tumor MicroenvironmentNidhi Menon¹, Ha Dang², Udaya Sree Datla¹, Maryam Moarefian¹, and Caroline N. Jones¹¹Virginia Polytechnic Institute and State University, Blacksburg, VA,²Washington University School of Medicine, St. Louis, MO

TH-621

Fructose Analog Containing 3D Scaffolds as Controllable Microenvironments to Isolate and Study Metabolic Cues in Breast CancerSrinivas Kannan¹, Samerender Nagam Hanumantharao¹, Kristine Fink¹,Carolynn Que¹, Marina Tanasova¹, and Smitha Rao¹¹Michigan Technological University, Houghton, MI

TH-622

Creating an Ex-Vivo 3D Cell-Culture Model from Decellularized Mice Colons (DMC) To Study Colorectal CancerBusola Alabi¹, Ryan La-Ranger², Woodring Wright¹, and Jerry Shay¹¹The University of Texas Southwestern Medical Center, Dallas, TX, ²Yale University, New Haven, CT

TH-623

Immunological Remodeling Coincides with Vascular and Lymphatic Remodeling in Breast CancerMeghan O'Melia¹, Paul Archer¹, and Susan N. Thomas¹¹Georgia Institute of Technology, Atlanta, GA

TH-624

Effects of Anti-CCL2 Cytokine Inhibition In A Subcutaneous Balb/c-CT26 Colon Carcinoma Murine Model

Shelby N. Bess¹, Gage J. Greening¹, and Timothy J. Muldoon¹
¹University of Arkansas, Fayetteville, AR

TH-625

Engineering a Microfluidic System to Model Tumor-Draining Lymph Node Transformation

Garrett Beeghly¹, Hafsa Munir¹, Magda Gerigk¹, Yan Yan Shery Huang¹, and Jacqueline Shields¹
¹University of Cambridge, Cambridge, United Kingdom

TH-626

HSF1 Drives a Pro-lymphomagenic Microenvironment Through Stromal Re-education and Matrix Remodeling

Jude Phillip¹, Nieves Calvo-Vidal¹, Maria Victoria Revuelta¹, Nahuel Zamponi¹, Benet Pera-Gresely¹, Tharu Fernando¹, Wayne Tam¹, Giorgio Inghirami¹, Ari Melnick¹, and Leandro Cerchietti¹
¹Weill Cornell Medicine, New York, NY

TH-627

The Effect of Extracellular Hyaluronic Acid and Hypoxia on Glioblastoma Stem Cell Invasiveness

Jee Wei Emily Chen¹, Jacopo Ferruzzi², Jann Sarkaria³, Muhammad Zaman², and Brendan Harley¹
¹University of Illinois at Urbana-Champaign, Urbana, IL, ²Boston University, Boston, MA, ³Mayo Clinic, Rochester, MN

TH-628

Analysis of Tumor-stroma Interactions that mediate HER2-targeted Therapy Resistance in Breast Cancer using Drug Screening, Proteomics and in situ Immunofluorescence

Ioannis Zervantonakis¹, Jia-Ren Lin¹, Peter Sorger¹, Gordon Mills², and Joan Brugge¹
¹Harvard Medical School, Boston, MA, ²Oregon Health & Science University, Portland, OR

TH-629

Single Grb2 Recruitment Dynamics Reflect RTK Environmental Sensing

Dhruv Thakar¹, Shalini Low-Nam², Jay Groves², and Valerie Weaver¹
¹University of California, San Francisco, San Francisco, CA, ²University of California, Berkeley, Berkeley, CA

TH-630

An Engineered Human Liver Cancer Co-Culture Platform for Novel Drug Discovery

Jennifer Liu¹ and Salman Khetani¹
¹University of Illinois at Chicago, Chicago, IL

TH-631

2D or not 2D: Whether to Culture MDAMB231 in the Third Dimension

Jennifer Munson¹, Shelly Peyton², and James Field³
¹Virginia Tech, Blacksburg, VA, ²University of Massachusetts- Amherst, Amherst, MA, ³West Virginia University, Morgantown, WV

TH-632

3D Bio-printed Glioblastoma-Vascular Niche Models

Vivian Lee¹, Hongyan Zou², Roland Friedel², and Guohao Dai¹
¹Northeastern University, Boston, MA, ²Icahn School of Medicine at Mount Sinai, New York, NY

TH-633

Extracellular Matrix Density Triggers Differential Migratory Phenotypes in Breast Cancer Spheroids

Jacopo Ferruzzi¹, Stephan A. Koehler², Jessica Kim¹, Kavon Karrobi¹, Darren Roblyer¹, Jeffrey J. Fredberg², and Muhammad H. Zaman^{1,3}
¹Boston University, Boston, MA, ²Harvard T.H. Chan School of Public Health, Boston, MA, ³Howard Hughes Medical Institute, Boston, MA

TH-634

Redirection of Human HER2-positive Breast Cancer Cells Using *In Vitro* Model

Anastasia Frank-Kamenetskii¹, Julia Mook¹, and Brian Booth¹
¹Clemson University, Clemson, SC

TH-635

Three-dimensional Hyaluronic Acid Hydrogels to Investigate Glioblastoma Stem Cell Behaviors

Pinaki Nakod¹, Shreyas Rao¹, and Yonghyun Kim¹
¹The University of Alabama, Tuscaloosa, AL

TH-636

Impact of ECM-bound CXCL12 Isoforms on Tumor Angiogenesis

Chia-Wen Chang¹, Alex Seibel¹, and Jonathan W. Song^{2,3}
¹Department of Chemical and Biomolecular Engineering, The Ohio State University, Columbus, OH, ²Department of Mechanical and Aerospace Engineering, The Ohio State University, Columbus, OH, ³Comprehensive Cancer Center, The Ohio State University, Columbus, OH

TH-637

Effects of Tumor-Targeting Drugs on Breast Cancer Cells In 3D-Printed Bone Scaffolds

Lauren Holtslander^{1,2}, Miranda Sowder^{1,2}, Julie A Sterling^{1,2,3}, and Rachelle W Johnson²
¹Vanderbilt University, Nashville, TN, ²Vanderbilt University Medical Center, Nashville, TN, ³Tennessee Valley Healthcare System, Nashville, TN

TH-638

Interrogating Glioma Stem Cell-Vascular Interactions Using a Three-Dimensional (3D) Organotypic Microfluidic Model

Danh Truong¹, Roberto Fiorelli², Eric S. Barrientos¹, Ernesto L. Melendez², Nader Sanai², Shwetal Mehta², and Mehdi Nikkhah¹
¹Arizona State University, Tempe, AZ, ²Barrow Neurological Institute, Phoenix, AZ

TH-639

Understanding the Role of ECM in Prostate Cancer Progression Using Advanced 3D Organoid Culture

Nicky Tam¹, Graham Dellaire¹, and John Frampton¹
¹Dalhousie University, Halifax, NS, Canada

TH-640

Identification of Molecular Signaling Cues between Cancer Cells and Stromal Fibroblasts Enhancing ECM Deregulation in a 3D Microengineered Platform

Harpinder Saini¹, Kiarash Rahmani¹, Meryl Rodrigues¹, Tanxi CAI¹, Mayar Allam¹, Casey Silva¹, Danh Truong¹, Tony Hu¹, Robert Ros¹, and Mehdi Nikkhah¹
¹Arizona State University, Tempe, AZ

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TH-641

Stromal Cell-Laden 3D Hydrogel Microwell Arrays as Tumor Microenvironment Model for Studying Stiffness Dependent Stromal Cell-Cancer InteractionsXiaoshan Yue¹, Trung Dung Nguyen¹, Victoria Zellmer¹, Siyuan Zhang¹, and Pinar Zorlutuna¹¹University of Notre Dame, Notre Dame, IN

TH-642

Engineered Prostate Tumor-on-a-Chip Model for In Vitro Recapitulation of the Tumor MicroenvironmentNicole Habbit¹, Benjamin Anbiah¹, Iman Hassani¹, Matthew Eggert¹, Shanese Jasper¹, Balabhaskar Prabhakarpandian², Robert Arnold¹, and Elizabeth Lipke¹¹Auburn University, Auburn, AL, ²Synvivo, Huntsville, AL

TH-643

Dynamic ECM Stiffening Results in EMT and Migratory Transformation in Epithelial CellsShane Allen¹ and Laura Suggs¹¹Department of Biomedical Engineering, The University of Texas at Austin, Austin, TX

TH-644

Metabolism and the Perivascular Niche Regulate Cancer Stem Cell PropertiesMatthew Tan¹, Katharina Wittmann¹, Emily Bell¹, Ofer Reizes², Jan Lammerding¹, and Claudia Fischbach-Teschl¹¹Cornell University, Ithaca, NY, ²Lerner Research Institute, Cleveland Clinic, Cleveland, OH

TH-645

Stiffening of the Extracellular Matrix Increases MDA-MB-231 Resistance to DoxorubicinMarshall Joyce¹, Carolyne Lu¹, Emily James¹, Rachel Hegab², and Amy Brock¹¹University of Texas at Austin, Austin, TX, ²Louisiana Tech University, Ruston, LA

TH-646

Diversifying Implantation Site of Porous Biomaterials to Create Tissue-specific MicroenvironmentsRyan Carpenter¹ and Jungwoo Lee¹¹University of Massachusetts Amherst, Amherst, MA

TH-647

A Novel, Patient-specific 3D Platform for High Throughput Analysis of Breast Cancer TherapeuticsKarel-Bart Celie¹, Daniel Lara², Yoshiko Toyoda², Justin Buro^{2,3}, Alexandra Lin¹, Matthew Wright¹, Arash Samadi², Priya Bhardwaj², Sofya Oshchepkova², Kristy Brown², and Jason Spector²¹Columbia University Vagelos College of Physicians and Surgeons, New York, NY, ²Weill Cornell Medicine, New York, NY,³George Washington University School of Medicine and Health Sciences, Washington, D.C., DC

TH-648

Hydrogel-based In Vitro Glioblastoma Spheroid ModelsLindsay Hill¹, Sana Syed¹, John Ortlund¹, and Silviya Petrova Zustiak¹¹Saint Louis University, Saint Louis, MO

Track: Cancer Technologies

Microfluidic Cancer Models

TH-649

An In Vitro Breast Tumor Mimetic Microfluidic Chip to Evaluate the Anti-cancer Drug EfficaciesBenjamin Anbiah¹, Iman Hassani¹, Nicole L Habbit¹, Shanese L Jasper¹, Matthew Eggert¹, Robert D Arnold¹, Balabhaskar Prabhakarpandian², and Elizabeth Lipke¹¹Auburn University, Auburn, AL, ²CFD Research Corporation, Huntsville, AL

TH-650

3D Cancer-on-a-chip with Vasculature for Chemotaxis TrackingLi Wan¹, Philip LeDuc¹, and Carola Neumann²¹Carnegie Mellon University, Pittsburgh, PA, ²University of Pittsburgh, Pittsburgh, PA

TH-651

A Spontaneous 3D Bone-On-a-Chip for Bone Metastasis Study of Breast Cancer CellsSijie Hao¹, Laura Ha¹, Gong Cheng¹, Yuan Wan¹, Yiqiu Xia¹, Donna Sosnoski¹, Andrea Mastro¹, and Si-Yang Zheng¹¹Penn State University, University Park, PA

TH-652

Interplay of Lymphatic Vasculature and Breast Cancer on Lymphatic InvasionLoan Bui¹ and Donny Hanjaya-Putra¹¹University of Notre Dame, Notre Dame, IN

TH-653

Development of a Dynamic Bioprinted Tumor ModelWilliam Hynes¹, Monica Moya¹, Jonathon Adorno¹, Nicholas Hum¹, Wei He¹, Aïmy Sebastian¹, Matthew Coleman¹, Gabriela Loots¹, and Elizabeth Wheeler¹¹Lawrence Livermore National Laboratory, Livermore, CA

TH-654

Adhesion Chromatography Microfluidic to Interrogate Selectin-Mediated Cancer Metastasis MechanismsKatherine Birmingham¹ and Susan Thomas¹¹Georgia Institute of Technology, Atlanta, GA

TH-657

In Vitro Model of Invasion and Intravasation from a Solid Breast Tumor into a Micro-Lymphatic VesselUsman Ghani¹, Allison Simi², Andreas Kourouklis², Siyang Han², Emily Margolis¹, Celeste Nelson², and Joe Tien¹¹Boston University, Boston, MA, ²Princeton University, Princeton, NJ

TH-658

Drug Cytotoxicity Quantification with a Mathematical Model and Three-dimensional Biomimetic MicrofluidicMaryam Moarefian¹, Nidhi Menon¹, Caroline Jones¹, Luke Achenie¹, and Danesh Tafti¹¹Virginia Tech, Blacksburg, VA

TH-659

A Vascularized Microfluidic Model for Evaluating Metastatic Tumor Migration and Colonization of Secondary Sites

Deborah Ramsey¹, Balabhaskar Prabhakarpandian¹, Dylan Gordon¹, Dustin Haithcock¹, Lauren Stokes¹, Charles Garson¹, Elizabeth Lipke², Robert Arnold², and Kapil Pant¹
¹CFD Research Corporation, Huntsville, AL, ²Auburn University, Auburn, AL

TH-660

Utilizing Microfluidic Platform to Screen Perivascular Signals Promoting Glioblastoma Tumor Cell Migration

Mai Ngo¹, Elijah Karvelis¹, and Brendan Harley¹
¹University of Illinois Urbana Champaign, Urbana, IL

Track: Nano and Micro Technologies

Micro/Nano Fluidic Engineering and Lab-on-Chip Systems

TH-661

Microfluidic Mucus Barrier for Capturing Dynamic Barrier Homeostasis in Response to Extrinsic Stimuli

Abhinav Sharma¹, Justinne R Guarini¹, Neil Forbes¹, and Jungwoo Lee¹
¹University of Massachusetts Amherst, Amherst, MA

TH-662

Affecting the Directional Migration of Transplantable Retinal Progenitor Cells using a Novel Electro-chemotactic Approach

Shawn Mishra¹, Kameron Starr¹, and Maribel Vazquez¹
¹City College of New York, New York, NY

TH-663

Versatile Microfluidic-based Platforms for High-throughput Antibiotic Susceptibility Testing

Seunggyu Kim¹, Fahim Masum¹, Seokhun Lee¹, and Jessie S. Jeon¹
¹KAIST, Daejeon, Korea, Republic of

TH-664

Ultrasound-enhanced Molecular Delivery to Red Blood Cells in a Microfluidic System for Dry Storage

Emily M. Murphy¹, Mariah C. Priddy¹, Brett R. Janis¹, Michael A. Menze¹, and Jonathan A. Kopechek¹
¹University of Louisville, Louisville, KY

TH-665

Simulation Model for the Small Intestine-on-a-Chip: Anti-inflammatory Testing at the Microscale

Chiara A.M. Fois¹, Thi Yen Loan Le¹, David F. Fletcher¹, and Fariba Dehghani¹
¹The University of Sydney, Sydney, Australia

TH-666

A Rapid Diagnostic System Using New Sample Preparation Technique in Clinical Applications

Choong Eun Jin^{1,2}, Bonhan Koo^{1,2}, and Yong Shin^{1,2}
¹University of Ulsan College of Medicine, Seoul, Korea, Republic of, ²Asan Medical Center, Seoul, Korea, Republic of

TH-667

All-in-one Automated Microfluidics Control System

Craig Watson¹ and Samuel Senyo¹
¹Case Western Reserve University, Cleveland, OH

TH-668

Automated Design of Microfluidic Chips for Biomedical Applications

William Grover¹
¹University of California, Riverside, Riverside, CA

TH-669

Continuous Separation of Lipoproteins via Acoustic Contrast Factor

Mengxi Wu^{1,2}, Chuyi Chen², Hunter Bachman², Po-Hsun Huang², and Tony Hunag²
¹Pennsylvania State University, State College, PA, ²Duke University, Durham, NC

TH-670

Micro-Particle Operations Using Asymmetric Traps

Jaesung Lee¹, Sarah Mena¹, and Mark Burns¹
¹The University of Michigan, Ann Arbor, MI

TH-671

Acoustofluidic Pumping to Mimic Blood Flow: Towards Improved On-chip Biological Systems

Hunter Bachman¹, Po-Hsun Huang¹, Shujie Yang¹, Pieran Zhang¹, and Tony Jun Huang¹
¹Duke University, Durham, NC

TH-672

Acoustofluidic Cell Trapping for Medium Transfer

Hunter Bachman¹, Joseph Rufo¹, Shujie Yang¹, and Tony Jun Huang¹
¹Duke University, Durham, NC

TH-673

Fluidic Platform for Long-Term Culture of Explanted Zebrafish Hearts

Joycelyn Yip¹, Michael Harrison^{2,3}, Ching-Ling (Ellen) Lien^{2,3,4,5}, and Megan McCain^{1,6}
¹Laboratory for Living Systems Engineering, Department of Biomedical Engineering, USC Viterbi School of Engineering, University of Southern California, Los Angeles, CA, ²Heart Institute, The Saban Research Institute of Children's Hospital Los Angeles, Los Angeles, CA, ³Program of Developmental Biology and Regenerative Medicine, The Saban Research Institute of Children's Hospital Los Angeles, Los Angeles, CA, ⁴Department of Surgery, Keck School of Medicine of USC, University of Southern California, Los Angeles, CA, ⁵Department of Biochemistry and Molecular Biology, Keck School of Medicine of USC, University of Southern California, Los Angeles, CA, ⁶Department of Stem Cell Biology and Regenerative Medicine, Keck School of Medicine of USC, University of Southern California, Los Angeles, CA

TH-674

Local Control of Oxygen Tension in Cell Cultures Using a Hybrid Microfluidic Device

Yandong Gao¹, Gulnaz Stybayeva¹, and Alexander Revzin¹
¹Mayo Clinic, ROCHESTER, MN

TH-675

Impedance Based MEMS Biosensor for Oocyte Cryopreservation

Rafal Ali¹, Ibrahim Jasim¹, Sura Muhsin¹, Lu Zhao¹, Yuksel Agca¹, Cansu Agca¹, James Benson², and Mahmoud Almasri¹
¹University of Missouri Columbia, Columbia, MO, ²University of Saskatchewan, Saskatoon, Canada

TH-676

Microfluidic Lab on a Chip for Determining Water Permeability of Red Blood Cells

Lining Huang¹, James Benson², Cansu Agca¹, Yuksel Agca¹, and Mahmoud Almasri¹

¹University of Missouri Columbia, Columbia, MO, ²University of Saskatchewan, Saskatoon, Canada

TH-677

Engineering a Perfusable Human Proximal Kidney Tubule “On a Chip” with Off-the-Shelf Equipment

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TH-678

Pressure-Driven Asymmetric Droplet Bilayer Networks

Taylor Schimel¹, Mary-Anne Nguyen¹, Stephen Sarles¹, and Scott Lenaghan¹

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TH-679

Spatial Hydrogel Sensor on Hypoxia Gradient for In Situ Beta Cell Characterization

Kai Duan¹, Jessica Hallgath¹, and Joe Lo¹

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TH-680

Optimizing Microfluidic Pumping of Variable Viscosities via a Micro Tesla Pump

Jessica Hallgath¹, Hussam Mawari¹, and Joe Lo¹

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TH-681

Immunoaffinity-Based Leukocyte Depletion from Whole Blood Via 3D-Printed Microfluidic Chips

Chia-Heng Chu¹, Ruxiu Liu¹, Tevhide Ozkaya Ahmadov¹, and Ali Fatih Sarioglu¹

¹Georgia Institute of Technology, Atlanta, GA

TH-682

White Blood Cell Manipulation on Microfluidic Paper-Based Analytical Devices via DC Electrokinetic Forces

Robin Furnish¹, Madison Hatkevich¹, Paul Jackemeyer¹, Anna Kersey¹, Mahmoud Khalil¹, and Melanie G Watson¹

¹Trine University, Angola, IN

TH-683

Dielectrophoretic Corral Trap for Single Particle Trapping and Characterization Technique

Tae Joon Kwak¹, Jörg C. Woehl², and Woo-Jin Chang^{1,3}

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TH-684

Spatial Command of PDMS Optical and Mechanical Properties by Controlled Diffusion-Reaction Processes

Bryan James¹ and Josephine Allen¹

¹University of Florida, Gainesville, FL

TH-685

Simultaneous Monitoring of Different Classes of Molecules Secreted by Perfused Hepatocytes in Microfluidic Tissue-Chips

Abhinav Bhushan¹, Sonali Karnik¹, and Qiyue Luan¹

¹Illinois Institute of Technology, Chicago, IL

TH-686

Monoclonal Antibody Cell Line Generation Using a Microfluidic Single-cell Proliferation Platform

Hao-Chen Chang^{1,2}, Hui-Ying Lin¹, Pei-Tzu Lia¹, Duane S. Juang¹, Chia-Yu Tang¹, and Chia-Hsien Hsu^{1,2}

¹National Health Research Institutes, Miaoli, Taiwan, ²National Chung Hsing University, Taichung, Taiwan

TH-687

A Microfluidic Biochip Platform for Electrical Quantification Of Proteins

Jacob Berger¹, Enrique Valera¹, Umer Hassan¹, and Rashid Bashir¹

¹University of Illinois, Champaign, IL

TH-688

Point-of-care Microfluidic Platform Using ZnO Nanowire Template for Virus Detection by Plasmonic Colorimetric Reaction

Yiqiu Xia¹, Yizhu Chen¹, Xu Yu¹, Zhiwen Liu¹, and Si-Yang Zheng¹

¹Penn State University, University Park, PA

TH-689

Intracellular Antibody Labelling Using Microfluidics for Convectively Driven Delivery

Vikram Varadarajan¹

¹Georgia Institute of Technology, Atlanta, GA

TH-690

Microfluidic Microinjection System for Ae. Aegypti Embryos

Jeonghyeon Cheon¹ and Seunghyun Kim¹

¹Baylor University, WACO, TX

TH-691

Modeling Particle-Particle Interactions in the Transport of Non-Spherical Particles in Microfluidic Channels

Raymond Yeung¹, William Grover¹, Victor Rodgers¹, and Philip Brisk¹

¹University of California, Riverside, Riverside, CA

**Track: Nano and Micro Technologies,
Cellular and Molecular Bioengineering**

**Micro/Nano Tools in Molecular and
Cellular Biology (Genomics, Proteomics)**

TH-692

**Microfluidic Method for the On-Chip
Electrochemical Determination of
Endothelial Permeability**

Jeremy Wong¹ and Craig Simmons¹
¹University of Toronto, Toronto, ON, Canada

TH-693

**High-Throughput Droplet-Based Microfluidic
Platform to Study and Engineer Cellular Fusion**

Benjamin Yang¹, Meng Ting Chung¹, Katsuo Kurabayashi¹, and
Carlos Aguilar¹
¹University of Michigan, Ann Arbor, Ann Arbor, MI

TH-694

**Microfluidic System To Examine Retinal Müller
Glia Migration and Interconnectivity**

Juan Pena¹, Eric Sun¹, Jack Twiddy¹, and Maribel Vazquez¹
¹The City College of New York, New York, NY

TH-695

**Scratch-based Micropatterning: A Low-
cost, High-resolution Technique to Control
Multicellular Shape**

Raymond Tran¹, Corinne A. Hoesli¹, and Christopher Moraes^{1,2}
¹McGill University, Montreal, QC, Canada, ²Goodman Cancer Research
Center, Montreal, QC, Canada

TH-696

**Feasibility of Isolation of Exosomes using
Ultrathin Nano Membranes**

Mehdi Dehghani¹ and Thomas Gaborski¹
¹Rochester Institute of Technology, Rochester, NY

TH-697

**Trapping and Visualizing DNA Holliday
Junctions Using DNA Curtains**

Harrison Khoo¹, Luke Strauskulage², and Sy Redding²
¹UC Berkeley, Berkeley, CA, ²UC San Francisco, San Francisco, CA

TH-698

**Single-Cell Metabolomic and Lipidomic Imaging
and Analysis by Laser Desorption/Ionization
Droplet Delivery Mass Spectrometry**

Jae Kyoo Lee¹, Hong Gil Nam², and Richard Zare¹
¹Stanford University, Stanford, CA, ²DGIST, Daegu, Korea, Republic of

TH-699

**Unusual Kinetic and Thermodynamic Behaviors of
Biomolecules in Water Microdroplets**

Jae Kyoo Lee¹, Inho Nam¹, Hong Gil Nam², and Richard Zare¹
¹Stanford University, Stanford, CA, ²DGIST, Daegu, Korea, Republic of

TH-700

RNA Thermometer Capstone Project

Isaiah Weidmann¹, Moriah Wiggins¹, Ting Hung-Lin¹, and
Olivia Auduong¹
¹University of Massachusetts Dartmouth, Dartmouth, MA

TH-701

**A Diffusion-based Microfluidic Device for
Single-cell RNA-Seq**

Mimosa Sarma¹, Jiyoun Lee¹, Song Li¹, and Chang Lu¹
¹Virginia Tech, Blacksburg, VA

Track: Cellular and Molecular Bioengineering

**Molecular and Cellular Engineering for
Functional Materials and Sensors**

TH-702

**Engineering a Magnetic Material Interface
Using Microbial Consortia for Improved
Patient Outcomes**

Michael Behrens¹, Warren C. Ruder¹, and Felicia Y. Scott²
¹University of Pittsburgh, Pittsburgh, PA, ²Virginia Polytechnic Institute
and State University, Blacksburg, VA

TH-703

**Microstructured Titanium Surfaces Mediate Bone
Remodeling through Coupling Factors**

Jingyao Deng¹, Zvi Schwartz^{1,2}, and Barbara Boyan^{1,3}
¹Virginia Commonwealth University, Richmond, VA, ²University of
Texas Health Science Center at San Antonio, San Antonio, TX, ³Georgia
Institute of Technology, Atlanta, GA

Track: Cellular and Molecular Bioengineering

Molecular and Cellular ImmunoEngineering

TH-704

**Manufacturing of Large-Scale T-Lymphocytes
Culture in Novel Bioreactor System**

Jianfa Ou¹, Yingnan Si¹, and X. Margaret Liu¹
¹The University of Alabama at Birmingham, Birmingham, AL

Track: Nano and Micro Technologies

**Molecular Sensors and Nanodevices
for Diagnostics**

TH-705

**Increased Dwell Time for DNA Transport
Through Solid State Nanopores By LiCl
Concentration Gradients**

Julian Bello¹, Maksudul Mowla¹, Nicholas Troise¹, and Jiwook Shim¹
¹Rowan University, Glassboro, NJ

TH-706

A Low-Cost, Point-Of-Care Test for Liver Function

Saundria Moed¹, Devika Nadkarni¹, Katie Clifford¹, Darash Desai¹, and
Muhammad H Zaman^{1,2}
¹Boston University, Boston, MA, ²Howard Hughes Medical Institute,
Boston, MA

TH-707

MiRNA Biomarker Detection in Serum Samples with Integrated Dielectrophoretic and Plasmonic Sensor

Logeeshan Velmanickam¹, Manpreet Baines¹, Glenn Dorsam¹, and Dharmakeerthi Nawarathna¹

¹North Dakota State University, Fargo, ND

TH-708

High Sensitive Integrated Dielectrophoretic and LSPR Sensor for Biomarker Detection

Logeeshan Velmanickam¹, Michael Fondakowski¹, Ivan Lima¹, and Dharmakeerthi Nawarathna¹

¹North Dakota State University, Fargo, ND

TH-709

Highly Sensitive Detection of Ascorbic Acid using Electronic Devices based on 2D MoS₂

Chengye Dong^{1,2}, Donna Deng¹, Kehao Zhang¹, Ritvik Muralidharan³, Joshua Robinson¹, and Aida Ebrahimi³

¹Penn State University, University Park, PA, ²Xi'an Jiaotong University, Shannxi, China, People's Republic of, ³Penn State University, State College, PA

TH-710

A Multiplexed Intracellular Probing (IP) Nanochip for Interrogation of Genetic Transforming in Cardiac Fibrosis

Lingqian Chang¹, Chandani Chitrakar¹, Junfeng Shi², and Ly James Lee²

¹University of North Texas, Denton, TX, ²Ohio State University, Columbus, OH

TH-711

Astigmatic Microscopy Allows Optimization of Convection in Rehydrating Aqueous Two-Phase System Assays

Cameron Yamanishi^{1,2}, C. Ryan Oliver², Taisuke Kojima¹, and Shuichi Takayama^{1,2}

¹Georgia Institute of Technology, Atlanta, GA, ²University of Michigan, Ann Arbor, Ann Arbor, MI

TH-712

A Hand-held Detection Platform for Clinical Diagnostics at Point-of-need Settings

Fatih Inci¹, Yeseren Saylan^{1,2}, Adil Denizli², and Utkan Demirci¹

¹Stanford University School of Medicine, Palo Alto, CA, ²Hacettepe University, Ankara, Turkey

TH-713

Molecularly Imprinted PEDOT/Polystyrene Microbeads for Dopamine Detection

John Molinski¹, Alexander Halliwell¹, Christopher Rego¹, Joshua Teixeira¹, Lewis Shabshelowitz¹, Prathyushakrishna Macha¹, and Milana Vasudev¹

¹University of Massachusetts Dartmouth, Dartmouth, MA

TH-714

Analysis of Physiological Hyaluronan Size Distribution with a Solid-state Nanopore Sensor

Felipe Rivas Duarte¹, Adam Hall¹, Elaheh Rahbar¹, Aleksander Skardal¹, Osama Zahid¹, Heidi Reesink², and Paul L. DeAngelis³

¹Wake Forest University, Winston Salem, NC, ²Cornell University Ithaca, NY, ³Hyalose LLC, Stillwater, OK

TH-715

Aptamer-Based ATP Biosensor for Characterizing Engineered Heart Tissue

Mehenor Sarwar¹ and Chen-Zhong Li¹

¹Florida International University, Miami, FL

TH-716

Translational Analysis of Hyaluronic Acid with a Solid-State Nanopore Sensor

Felipe Rivas¹, Paul DeAngelis², Heidi Reesink³, Elaheh Rahbar¹, and Adam Hall¹

¹Wake Forest University School of Medicine, Winston Salem, NC,

²University of Oklahoma Health Sciences Center, Oklahoma City, OK,

³Cornell University, Ithaca, NY

TH-717

GO-Based Paper Sensor for Point Of Care Detection of Stress-Related Markers

Kyung Eun You¹, Seung Mi Kim¹, and Hyeun Joong Yoon¹

¹University of Nevada Reno, Reno, NV

Track: Stem Cell Engineering, Orthopedic and Rehabilitation Engineering

Musculoskeletal Stem Cell Engineering

TH-718

Minerals and Their Role in Modulating Human Mesenchymal Stem Cell Activity

Anna Brokesh¹, Lauren Cross¹, Jake Carrow¹, Beth Vonasek¹, and Akhilesh Gaharwar¹

¹Texas A&M University, College Station, TX

TH-719

Muscle Stem Cell Niche Dysregulation in Volumetric Muscle Loss

Shannon Anderson¹, Woojin Han¹, Vunya Srinivasa¹, Mahir Mohuiddin¹, Marissa Ruehle¹, Austin Moon¹, Eunjung Shin¹, Cheryl San Emeterio¹, Edward Botchwey¹, Nick Willett^{2,3}, and Young Jang¹

¹Georgia Institute of Technology, Atlanta, GA, ²Emory University, Atlanta, GA, ³Atlanta Veteran's Affairs Medical Center, Atlanta, GA

TH-720

NANOG Reverses the Senescent Phenotype of Skeletal Muscle Myoblasts.

Aref Shahini¹, Debanik Choudhury¹, Kalyan Vydiam¹, Nika Rajabian¹, Thy Nguyen¹, Pedro Lei¹, and Stelios Andreadis¹

¹University at Buffalo, Buffalo, NY

TH-721

Migration of Dental Pulp Stem Cell-derived Chondrogenic Cells In Collagen Hydrogel

Li Yao¹, Nikol Flynn¹, and Pranita Kaphe¹

¹Wichita State University, Wichita, KS

TH-722

Regulation of Myogenesis by Substrate and Stimulation

Anjali Patel¹, Sara Vendrell Gonzalez¹, Gabriel Haas¹, Madison Marcinczyk¹, Natalia Ziemkiewicz¹, Muhamed Talovic¹, Krishna Patel¹, and Koyal Garg¹

¹Saint Louis University, Saint Louis, MO

Track: Tissue Engineering, Orthopedic and Rehabilitation Engineering

Musculoskeletal Tissue Engineering

TH-723

Optimizing a Scalable Platform for Engineering Skeletal Muscle Bundles

Nethika R. Ariyasinghe¹ and Megan L. McCain^{1,2}

¹Laboratory for Living Systems Engineering, Department of Biomedical Engineering, USC Viterbi School of Engineering, University of Southern California, Los Angeles, CA, ²Department of Stem Cell Biology and Regenerative Medicine, Keck School of Medicine at USC, University of Southern California, Los Angeles, CA

TH-724

Controlled Delivery of VEGF Mimetic Peptides on Bone Grafts to Elicit a Proangiogenic Response

Nicholas Pensa¹, Andrew Curry¹, Michael Reddy¹, and Susan Bellis¹

¹University of Alabama at Birmingham, Birmingham, AL

TH-725

Cryopreservation and Revival of Tissue Engineered Skeletal Muscle

Lauren Grant¹, Ritu Raman², Pierce Hadley¹, Gelson Pagan-Diaz¹, and Rashid Bashir¹

¹University of Illinois at Urbana-Champaign, Urbana, IL, ²Massachusetts Institute of Technology, Cambridge, MA

TH-726

Macroporous Inorganic-Organic Hybrid Hydrogels for Bone Regeneration

Michael Frassica¹, Sarah Jones¹, Mariah Hahn², and Melissa Grunlan¹

¹Texas A&M University, College Station, TX, ²Rensselaer Polytechnic Institute, Troy, NY

TH-727

Osteone-Like 3D Printed Scaffolds Enhanced Paracrine Signaling of Mesenchymal Stem Cells and Endothelial Cells, and Neovascularization

Charlotte Piard¹ and John Fisher^{1,2}

¹University of Maryland, College Park, MD, ²NIH Center for Engineering Complex Tissues, College Park, MD

TH-728

Regenerative Repair of Volumetric Muscle Loss Injuries is Sensitive to Age

John Kim¹, Benjamin Kasukonis¹, Grady Dunlap¹, Richard Perry¹, Tyrone Washington¹, and Jeffrey Wolchok¹

¹University of Arkansas, Fayetteville, AR

TH-729

Hydrazone Covalent Adaptable Networks to Modulate ECM Deposition for Cartilage Tissue Engineering

Benjamin Richardson^{1,2}, Daniel Wilcox¹, Mark Randolph^{3,4}, and Kristi Anseth^{1,2}

¹University of Colorado Boulder, Boulder, CO, ²BioFrontiers Institute, Boulder, CO, ³Harvard Medical School, Boston, MA, ⁴Massachusetts General Hospital, Boston, MA

TH-730

Modeling Inflammatory Rheumatoid Arthritis in Engineered Human Skeletal Muscle

Lingjun Rao¹ and Nenad Bursac²

¹Duke University, Durham, NC, ²Duke University, Durham, NC

TH-731

Bioactive Cryogel Scaffolds as Templates for the Regeneration of Cleft-Craniofacial Bone Defects

Katherine Hixon¹, Meghana Pendyala¹, Savannah Bogner¹, Marissa Carletta¹, Sarah McBride-Gagyi¹, and Scott Sell¹

¹Saint Louis University, St. Louis, MO

TH-732

Low Amino Acid and Growth Factor Reduced Conditions Promote Decreased Basal Glucose Uptake In Tissue Engineered Human Skeletal Muscle

Megan Kondash¹ and George Truskey¹

¹Duke University, Durham, NC

TH-733

The Influence Of TGF- β 1 On Fiber Formation and Alignment in Fibrochondrocyte-Seeded High-Density Collagen Constructs

Jongkil Kim¹ and Lawrence Bonassar¹

¹Cornell University, Ithaca, NY

TH-734

Driving Osteogenesis in ASCs by Targeting BMP Antagonists with CRISPR Epigenome Editing

Jacob Weston¹, Hunter Levis¹, Brandon Lawrence¹, and Robert Bowles¹

¹University of Utah, Salt Lake City, UT

TH-735

Investigating the Effects of Cell-Cell Junctions on Stem Cell Behavior for Tendon Tissue Engineering

Alexander Q. Wixom¹, Sophia K. Theodossiou¹, John R. Tokle¹, and Nathan R. Schiele¹

¹University of Idaho, Moscow, ID

TH-736

Optimizing Myoblast Cell Sources for Robustly Engineering Functional Skeletal Muscle Disease Models

Jeffrey W. Santoso¹ and Megan L. McCain^{1,2}

¹Laboratory for Living Systems Engineering, Department of Biomedical Engineering, USC Viterbi School of Engineering, University of Southern California, Los Angeles, CA, ²Department of Stem Cell Biology and Regenerative Medicine, Keck School of Medicine at USC, University of Southern California, Los Angeles, CA

TH-737

On the Road to Sports Medicine: Meta-Analyses Driven Device Specification

Samantha Magliato¹, Dhruv Seshadri¹, Colin Drummond¹, and James Voos²

¹Case Western Reserve University, Cleveland, OH

²University Hospitals Sports Medicine Institute, Cleveland, OH

TH-738

Achilles Tendon Mechanical Properties and Weight-Bearing Locomotion in Developing Neonatal Rats

Sophia K. Theodossiou¹, Abigail R. Raveling¹, Jordan J. Becker¹

Nicholas Burgett², Leah R. Kollmeyer², Michele R. Brumley², and Nathan R. Schiele¹

¹University of Idaho, Moscow, ID, ²Idaho State University, Pocatello, ID

Thursday, October 18 | 9:30 am–5:00 pm | GWCC Exhibit Hall

Poster Viewing with Authors & Refreshment Break | 9:30 am–10:15 am and 3:00 pm–3:45 pm

Track: Nano and Micro Technologies, Drug Delivery & Intelligent Systems

Nanotechnologies for Drug and Nucleic Acid Delivery

TH-739

Reproducible Formulation of Long-term, Stable Targeted ECO/siRNA nanoparticles for Treating Triple Negative Breast CancerNadia Ayat¹, Zhanhu Sun¹, Michelle Yin¹, Andrew Schilb¹, Da Sun¹, and Zheng-Rong Lu¹¹Case Western Reserve University, Cleveland, OH

TH-740

In Vivo Assessment of Toxicity of Gold Nantheranostic AgentNagwa El-Baz¹, Kurtis James¹, Rajat Chauhan¹, Betty Nunn¹, Andy Switala¹, Ayman El-Baz¹, Robert Keynton¹, Paula Bates¹, Tariq Malik¹, and Martin O'Toole¹¹University of Louisville, Louisville, KY

TH-741

Microparticle-Mediated Membrane Puncture Enhances Lipofection of Human Mesenchymal Stem CellsAlbert Nguyen¹, Azade Mostafavi¹, Yogendra Mishra², Ali Tamayol¹, and Angela Pannier¹¹Biomedical Engineering Program, University of Nebraska-Lincoln, Lincoln, NE, ²Institute for Materials Science, Kiel University, Kiel, Germany

TH-742

Encapsulation of Hydrophobic Piperlongumine into Nanoscale Liposomes for Cell Treatment via Complexation with CyclodextrinKalana Jayawardana¹, Nidhi Jyotsana¹, Zhenjiang Zhang¹, Michael King¹¹Vanderbilt University, Nashville, TN

TH-743

Targeted Modulators of Macrophage Phenotype for Obesity TherapyNatalia Gonzalez Medina¹, Yang Liu¹, Hongping Deng¹, Suma Prabhu¹, Kelly Swanson¹, and Andrew Smith¹¹University of Illinois at Urbana-Champaign, Urbana, IL

TH-744

Hybrid Nanoparticles as Platform for Combined Hyperthermia and Drug DeliveryCatalina-Paula Spatarelu¹, Shan Zhao¹, Kniya De'De¹, and Zi Chen¹¹Dartmouth College, Hanover, NH

TH-745

Liposomal Combination Drug and siRNA Delivery to Combat Drug-Resistant Ovarian CancerEmily Miller¹ and Angela Alexander-Bryant¹¹Clemson University, Clemson, SC

TH-746

Silencing SOX4 with ECO/siSOX4 Nanoparticles Inhibits Invasiveness and Migratory Ability of Triple Negative Breast CancerAndrew Schilb¹, Josef Scheidt¹, Nadia Ayat¹, Amita Vaidya¹, Zhanhu Sun¹, and Zheng-Rong Lu¹¹Case Western Reserve University, Cleveland, OH

TH-747

ABT-737-Loaded PLGA Nanoparticles for Triple Negative Breast Cancer TherapyDanielle Valcourt¹ and Emily Day^{1,2}¹University of Delaware, Newark, DE, ²Helen F. Graham Cancer Center & Research Institute, Newark, DE

TH-748

Poly(DL-lactide) Particles with Sustained Antigen Release and Higher Antigen Loading Improved Amelioration at the Acute and Chronic Stage of Experimental Autoimmune EncephalomyelitisEiji Saito¹, Robert Kuo¹, Kevin Kramer¹, Nishant Gohel¹, Brandon Cheung¹, Neha Kaushal¹, and Lonnie Shea¹¹University of Michigan, Ann Arbor, MI

TH-749

Enhancing Therapeutic Efficacy of Extracellular Vesicles via Exogenous Co-loading of MiRNA CargoesAnjana Jeyaram¹, Louis Born¹, Tek Lamichhane¹, and Steven Jay¹¹University of Maryland, College Park, MD

TH-750

Intravenously Administered Nanoparticles Activate Retinoid Signaling in the Central Nervous System and are Neuroprotective in ALSDavid Medina¹, Collin Teague¹, Eugene Chung¹, Robert Bowser¹, and Rachael Sirianni^{1,2}¹Barrow Neurological Institute, Phoenix, AZ, ²University of Texas Health Science Center, Houston, AZ

Track: Nano and Micro Technologies

Nanotechnologies for Global Health

TH-751

Size, Concentration, And Time Dependent Effects of PEGylated Gold Nanoparticles on Cardiovascular Cell ViabilityJeffrey Henson¹, Jin-Woo Kim¹, Hanna Jensen¹, and Morten Jensen¹¹University of Arkansas, Fayetteville, AR

TH-752

Atrazine-Loaded PLGA Nanobercides: An Engineering Approach to Mitigate Environmental ProblemsBrian Schnoor¹, Ahmad Elhendawy¹, Suzanna Joseph¹, Mark Putman¹, Randall Chacón-Cerdas², Dora Flores-Mora², Felipe Bravo-Moraga³, Fernando Gonzalez-Nilo³, and Carolina Salvador-Morales¹¹George Mason University, Manassas, VA, ²Instituto Tecnológico de Costa Rica, Cartago, Costa Rica, ³Universidad Andres Bello, Santiago, Chile

TH-753

Smart-Phone Paper-Based Fluorescent Sensor for Ultra-Low Inorganic Phosphate DetectionMehenu Sarwar¹ and Chen-Zhong Li¹¹Florida International University, Miami, FL

TH-754

Engineering Antibacterial Nanosurfaces for Clinical ImplementationJames Moxley¹, Paria Ghannadian¹, and Thomas Webster¹¹Northeastern University, Boston, MA

TH-755

High Sensitive Influenza Lateral Flow Assay by Integration of Sample Preconcentration Unit

Cheonjung Kim¹, Hyungsuk Kim¹, and Jeong Hoon Lee¹
¹Kwangwoon University, Seoul, Korea, Republic of

Track: Nano and Micro Technologies, Biomedical Imaging and Instrumentation

Nanotechnology-Enabled Biomedical Imaging

TH-756

Trackable Ultrasmall Iron Oxide Nanoparticles (USNPs) for Neural Stem Cell Transplantation Therapy

Joe Park¹, Jennifer Sherwood¹, Yuping Bao¹, and Yonghyun Kim¹
¹The University of Alabama, Tuscaloosa, AL

TH-757

Activatable Magnetic Resonance Contrast Agents for the Detection of Reactive Oxygen Species

Chukwuazam Nwasike¹, Eunsoo Yoo¹, and Amber Doiron¹
¹SUNY Binghamton, Binghamton, NY

TH-758

A Biocompatible and Biodegradable Nanoparticle Alternative to Contrast Dyes in Angiograms using Selective Plane Illumination Microscopy

Victoria Messerschmidt¹, Aneetta Kuriakose¹, Kytai Nguyen¹, and Juhyun Lee¹
¹University of Texas at Arlington, Arlington, TX

TH-759

Using Brownian Fluctuations to Reconstruct Adhesive Energy Landscapes

Todd Sulchek¹, Ahmad Haider¹, and Alan Liu¹
¹Georgia Tech, Atlanta, GA

Track: Biomaterials

Natural and Bioinspired Biomaterials

TH-760

Bio-inspired Preservation of Human Natural Killer Cells for Cancer Immunotherapy

Rami El Assal¹, Lotfi Abou-Elkacem¹, Alessandro Tocchio¹, Shannon Pasley², Sandro Matosevic², David L. Kaplan³, Claudia Zylberberg², and Utkan Demirci¹
¹Stanford University School of Medicine, Palo Alto, CA, ²Akron Biotech, LLC, Boca Raton, FL, ³Tufts University, Medford, MA

TH-761

Osteoblast-to-Osteocyte Differentiation via Mechanoculture of Stacked Demineralized Bone Slices

Yongkuk Park¹ and Jungwoo Lee¹
¹University of Massachusetts Amherst, AMHERST, MA

TH-762

Bioinspired Anti-Fouling Surface for Orthopedics & Dental Implants

Drew Elliott¹, Brandon Knouse², and Rupak Dua¹
¹Hampden-Sydney College, Hampden Sydney, VA, ²Hampden-Sydney College, Hampden-Sydney, VA

TH-763

Effects of Spider Wrapping Silk Dope on Fibre Properties

Lingling Xu¹, Nathan Weatherbee-Martin¹, Jan Rainey¹, and Xiangqin Liu¹
¹Dalhousie University, Halifax, NS, Canada

TH-764

Development of a Collagen and Biomaterialized Silk Bone-Ligament-Bone Graft

Joseph Pearson¹, Grecia Gonzalez², Bailey Cole¹, Joo Ong¹, and Teja Guda¹
¹University of Texas at San Antonio, San Antonio, TX

TH-765

Electrospun Chitosan Membranes Loaded with Raspberry Ketone for Guided Bone Regeneration Applications

Paul Cameron¹, Fernanda Delbuque Guerra¹, Vishnu P. Murali¹, Hengjie Su¹, and Joel D. Bumgardner¹
¹University of Memphis, Memphis, TN

TH-766

Microstructural, Chemical and Nanomechanical Analysis of Cat Vibrissae

Gari Eberly¹ and Donna Ebenstein¹
¹Bucknell University, Lewisburg, PA

TH-767

Incorporation of Honey-Based Phenolic Acids Into Shape Memory Polymers for Antimicrobial Hemostats

Katharyn Grant¹, Alexandra Easley¹, Mary Beth Browning Monroe¹, and Duncan J. Maitland¹
¹Texas A&M University, College Station, TX

TH-768

A Non-Recombinant Way to Fine Tune Transition Temperature of Elastin-like Polypeptides

A. L. Prasanga Silva¹, Rohan Ingrole¹, Angelit Fernandes¹, Twaritha Vijay¹, Nithya Mudaliar¹, Jatindra Tripathy¹, and Harvinder Singh Gill¹
¹Texas Tech University, Lubbock, TX

TH-769

Synthesis and Characterisation of Tellurium Nanowires using Both Chemical and Green Routes and Their Comparison in Terms of Biocompatibility and Anticancer Properties

Ada Vernet Crua¹, David Medina¹, and Thomas Webster¹
¹Northeastern University, Boston, MA

TH-770

Aloe Vera-mediated Green Synthesis of Tellurium Nanostructures with both Antimicrobial and Anticancer Activity

David Medina¹, Ada Vernet¹, and Thomas Webster¹
¹Northeastern University, Boston, MA

TH-771

Molecular Design of Tandem-repeat Proteins by Synthetic Biology and their Mechanical Properties.

Huihun Jung¹, Abdon Pena-Francesch², Benjamin Allen³, and Melik Demirel¹
¹Pennsylvania state university, University park, PA, ²Max Planck Institute for Intelligent Systems, Stuttgart, Germany, ³Pennsylvania state university Department of Biochemistry and Molecular Biology, University park, PA

TH-772

Resorbable Silk Splints for the Treatment of Severe Pediatric Tracheomalacia

Meghan McGill¹, Nikhila Raol^{2,3}, Kevin S. Gipson⁴, Sarah Bower³, Jackson Fulk-Logan¹, Anahita Nourmahnad³, Joon Yong Chung⁴, Michael J. Whalen⁴, Christopher J. Hartnick³, and David L. Kaplan¹
¹Tufts University, Medford, MA, ²Emory University School of Medicine, Atlanta, GA, ³Massachusetts Eye and Ear Infirmary, Boston, MA, ⁴Massachusetts General Hospital, Boston, MA

TH-773

An Automated Process for the Fabrication of Aligned Collagen Substrates with Tunable Fiber Properties

Adeel Ahmed¹, Nicole Mazzola¹, Matthew Williams¹, Thomas Gaborski¹, and Vinay Abhyankar¹
¹Rochester Institute of Technology, Rochester, NY

TH-774

Tunable Synthetic Mucin for Structural Studies of Mucus Gels

Austin Schlirf¹, Zach Clauss¹, Nathaniel Wright¹, and Jessica Kramer¹
¹University of Utah, Salt Lake City, UT

TH-775

Bacterial Detection by Fluorescence Quenching Based on Carbon Dot-Dopamine Interactions

Joo Hoon Lee¹ and Hyun Jung Chung¹
¹Korea Advanced Institute of Science and Technology, Daejeon, Korea, Republic of

TH-776

Rapid and Ubiquitous Detection of Gram-Negative Bacteria Using Colistin as the Targeting Ligand

Jea Sung Ryu¹ and Hyun Jung Chung¹
¹Korea Advanced Institute of Science and Technology, Daejeon, Korea, Republic of

TH-777

Tunable Nitric Oxide (NO)-releasing Polymers for Hemocompatible and Antimicrobial Surfaces

Elizabeth Brisbois¹, Jitendra Pant², Priyadarshini Singha², and Hitesh Handa²
¹University of Central Florida, Orlando, FL, ²University of Georgia, Athens, GA

TH-778

Photocrosslinkable Unnatural Amino Acids Enable Synthesis of Thermoresponsive Nano-to Micro-gels

Simone Costa^{1,2}, Joseph Simon^{1,2}, Miriam Amiram^{3,4}, Lei Tang¹, Stefan Zauscher^{1,2}, Eric Brustad⁵, Farren Isaacs⁴, and Ashutosh Chilkoti¹
¹Duke University, Durham, NC, ²National Science Foundation Triangle Materials Research Science and Engineering Center, Durham, NC, ³Ben-Gurion University, Beer-Sheva, Israel, ⁴Yale University, New Haven, CT, ⁵University of North Carolina-Chapel Hill, Chapel Hill, NC

TH-779

A Study on the Biomechanics of Insect Respiration as a Platform for Microfluidic Devices

Khaled Adjerid¹, Nitika Sood², Raffaella De Vita¹, and Jake Socha¹
¹Virginia Tech, Blacksburg, VA, ²Pulaski County High School, Dublin, VA

TH-780

Biomimetic Hydroxyapatite Precipitation Induced by Polydopamine Nanolayers

Ravi Shankar¹, Seyed Mohsen Latifi¹, Ushna K.B. Arora¹, and Henry J. Donahue¹
¹Virginia Commonwealth University, Richmond, VA

TH-781

Biological Inspiration from Salt-exclusion in Mangroves Toward Anti-biofouling Reverse Osmosis Membranes

Adam Wood¹, Kyle Justus¹, Eric Parigoris¹, Philip LeDuc¹, and Alan Russell¹
¹Carnegie Mellon University, Pittsburgh, PA

TH-782

Physiochemical and Biological Characterization of a Bioinspired Hybrid Wound Dressing

Jitendra Pant¹, Sean Hopkins¹, Marcus Goudie¹, Megan Douglass¹, and Hitesh Handa¹
¹University of Georgia, Athens, GA

TH-783

Dual Functionality of Nitric Oxide Releasing Tethered Moieties: Antifouling and Antibacterial

Priyadarshini Singha¹, Marcus Goudie¹, Sean Hopkins¹, and Hitesh Handa¹
¹University of Georgia, Athens, GA

TH-784

Weaving Demineralized Bone Slices

Eugene Cheong¹, Grace Yi², Ryan Carpenter², and Jungwoo Lee²
¹University of Massachusetts-Amherst, Amherst, MA, ²University of Massachusetts, Amherst, MA

Track: Tissue Engineering, Biomaterials

Naturally-Derived and Extracellular Matrix Biomaterials in Tissue Engineering

TH-785

Hyaluronic Acid as a Macromolecular Crowding Agent for Biomanufacturing of Human Cell-Derived Matrices

Dalia Shendi¹, David Dolivo¹, Tanja Dominko¹, and Marsha Rolle¹
¹Worcester Polytechnic Institute, Worcester, MA

TH-786

Electrospun Branched-Clusters: A New Approach to Tissue-Engineered Cartilage

Kasyap Cherukuri¹, Benjamin Minden-Birkenmaier¹, Mallory Gullet¹, and Gary Bowlin¹
¹University of Memphis, Memphis, TN

TH-787

Bioinformatic Analysis of Decellularized Pancreatic Extracellular Matrix for Stem Cell Differentiation

Huanjing Bi¹, Kaiming Ye¹, and Sha Jin¹
¹SUNY-Binghamton, Binghamton, NY

TH-788

Developing Bioactive Polymers Using Cell-Assembled Extracellular Matrix for Nerve Regeneration

Zhenyuan Xu¹ and Greg Harris¹
¹University of Cincinnati, Cincinnati, OH

TH-789

Structured Biomaterials for Tissue Engineered Meats and Meat Analogues

Luke MacQueen¹, Grant Gonzalez¹, Charles Alver¹, Christophe Chantre¹, John Zimmerman¹, Seunkuk Ahn¹, Pina Fritz¹, and Kevin Kit Parker¹
¹Harvard University, Cambridge, MA

TH-790

Angiogenic Potential of Decellularized Pancreatic Extracellular Matrix

Soojin Kim¹, Daniel Lee², Natalija Tasovac¹, and Eun Jung Alice Lee¹
¹New Jersey Institute of Technology, Newark, NJ, ²Rutgers University - Newark, Newark, NJ

TH-791

In Vitro Antifibrotic Effect Of Porcine Derived Lamina Propria Extracellular Matrix Hydrogel

Andreea Badileanu^{1,2}, Camilo Mora-Navarro^{1,2}, Emily Wrona^{1,2}, Ana Gracioso Martins^{1,2}, Lewis Gaffney^{1,2}, Connor Campbell³, Erin Harrell³, Xinxia Peng^{3,4}, Ryan Branski⁵, and Donald Freytes^{1,2}
¹UNC-Chapel Hill/NCSU Joint Department of Biomedical Engineering, Raleigh, NC, ²Comparative Medicine Institute, North Carolina State University, Raleigh, NC, ³NCSU Department of Molecular Biomedical Sciences, Raleigh, NC, ⁴NC State Bioinformatics Research Center, Raleigh, NC, ⁵NYU Voice Center, Department of Otolaryngology - Head and Neck Surgery, New York, NY

TH-792

Resorbable Hyaluronan Hydrogel Coatings on Acellular Dermis Grafts-A Potential Strategy to Improve Biologic Graft Durability in Hernia Repair Applications

Sambit Sahoo¹, Jinjin Ma¹, Luciano Tastaldi¹, Andrew Baker¹, Jacqueline Loftis¹, Michael Rosen¹, and Kathleen Derwin¹
¹Cleveland Clinic, Cleveland, OH

TH-793

A Thermoreversible and Photoactive Collagen-Based Scaffold for Tissue Engineering Applications

Yolielm S. Miranda Alarcón¹, Dorota Jazwinska², and David Shreiber²
¹Rutgers University, Piscataway township, NJ, ²Rutgers University, Piscataway township, NJ

TH-794

Engineering Highly Aligned Human Muscle using Plant-derived Cellulose Scaffolds

Daniel Shiwarski¹, Ya-wen Cheng¹, Rebecca Ball¹, Kathryn Whitehead¹, and Adam Feinberg¹
¹Carnegie Mellon University, Pittsburgh, PA

TH-795

Exploration of a Modular Microcapsule Scaffold System for Cartilage Tissue Engineering

Patrick Erickson¹, Kevin Miles¹, and Howard Matthew¹
¹Wayne State University, Detroit, MI

TH-796

Fast Healing of Diabetic Foot Ulcers using SIS-based Regenerative Therapy and Antimicrobial 3D Scaffolds

L. Lorena Cárdenas¹, Juliana Jaramillo¹, Carolina Muñoz¹, Juan C. Cruz¹, and Juan C. Briceño¹
¹Universidad de los Andes, Bogotá, Colombia

TH-797

Novel Methods for Collagen Microsphere Fabrication

Colten Snider¹, Mitch Bellrichard¹, David Grant¹, and Sheila Grant¹
¹University of Missouri, Columbia, MO

TH-798

A Study of Optimizing Gold Nanoparticle-ECM Genipin Crosslinking

Mitch Bellrichard¹, Colten Snider¹, John Brockman¹, David Grant¹, and Sheila Grant¹
¹University of Missouri, Columbia, MO

TH-799

Development of a Decellularization Process for the Intervertebral Disc to Preserve Key Matrix Components

David Lillyman¹, Logan Piening¹, Lauren Hunt¹, and Rebecca Wachs¹
¹University of Nebraska-Lincoln, Lincoln, NE

TH-800

Electrospun Decellularized Extracellular Matrix Scaffolds for Myogenic Differentiation

Mollie Smoak¹, Albert Han¹, Alysha Kishan², Elizabeth Cosgriff-Hernandez², and Antonios Mikos¹
¹Rice University, Houston, TX, ²Texas A&M Health Science Center, Houston, TX

Thursday, October 18 | 9:30 am–5:00 pm | GWCC Exhibit Hall

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TH-801

A 3D Printing Approach To Extensional Flow-Induced Crystallization Of Type I CollagenShravani Kakarla¹, Jeffrey Paten², Jeffrey Ruberti², and Guohao Dai²
¹Northeastern University, Brookline, MA, ²Northeastern University, Boston, MA

TH-802

Apoptosis-Mediated Decellularization Approaches for Lung Tissue EngineeringYoung Hye Song¹, Daniel Visosevic¹, Kaitlyn Daramola¹, Stacy Porvasnik¹, and Christine Schmidt¹
¹University of Florida, Gainesville, FL

TH-803

Engineering A Long-Term and Functional 3D Human Liver Model Using Silk ScaffoldsDavid Kukla¹, Whitney Stoppel², David Kaplan³, and Salman Khetani¹
¹University of Illinois at Chicago, Chicago, IL, ²University of Florida, Gainesville, FL, ³Tufts University, Medford, MA

Track: Translational Biomedical Engineering

Tissue/Organoid Biofabrication

TH-804

Development of Devices for Rapid Extraction of StemCell-Collagen Patches from Human Umbilical CordsTushar Sharma¹, Mitchell George¹, Kevin Aroom¹, Cecilia Martin¹, Karthik Prabhakara¹, Max Skibber¹, Fabio Triolo¹, Charles Cox¹, and Brijesh Gill¹
¹UT Health, Houston, TX

Track: Tissue Engineering

Tissue Engineering—Other/Non-specified

TH-805

Dimensionality of In Vitro Growth Environment and its Effects on Mesenchymal Stem Cell DifferentiationFatema Zohora¹, Nasim Nosoudi¹, Puspendra P Singh¹, and Jaime E Ramirez-Vick¹
¹Wright State University, Dayton, OH

TH-806

Effect of Hypoxia and Confinement on the Expression of Biomolecules in Migrating Glioblastoma CellsRami Barakat¹, Qionghua Shen¹, Loan Bui¹, James Battiste², and Young-tae Kim¹
¹University of Texas at Arlington, Arlington, TX
²University of Oklahoma, Oklahoma, OK

TH-807

Selective Serotonin Reuptake Inhibitors Adversely Impact Placental Barrier CellsNavein Arumugasaamy^{1,2}, Peter Kim^{2,3}, and John Fisher^{1,2}
¹University of Maryland, College Park, College Park, MD, ²Children's National Health System, Washington, DC, ³The George Washington University, Washington, DC

TH-808

Modeling Glaucomatous Damage in the Trabecular Meshwork with Oxidative StressKristin Gao¹, Eric Snider¹, and Ross Ethier¹
¹Georgia Institute of Technology, Atlanta, GA

TH-809

Polymeric Scaffold Loaded with Simvastatin and Beta-cyclodextrin Modified Hydroxyapatite Inclusion Complex for Bone RegenerationJung Bok Lee¹, Young Min Shin¹, Su A Park², Il Keun Kwon³, and Hak-Joon Sung¹¹Severance Biomedical Science Institute, College of medicine, Yonsei University, Seoul, Korea, Republic of, ²Korea Institute of Machinery and Materials, Daejeon, Korea, Republic of, ³Kyung Hee University, Seoul, Korea, Republic of

TH-810

Multiphase Modeling of Monocyte Migration in a Flow Bioreactor System: An In Silico StudyMax Kozak¹, Heather Fahlenkamp¹, and Yu Feng¹
¹Oklahoma State University, Stillwater, OK

TH-811

Engineered Basal Lamina Equivalent for Detection of EMT Biomarkers in Cancer ProgressionTamara Hill¹, Chidalu Mosey¹, Nicholas Prasatporn¹, Turki Almugaiteeb¹, Loan Bui¹, and Rami Barakat¹
¹University of Texas at Arlington, Arlington, TX

TH-812

Chemotherapy Resistance and Oncoprotein Expression in Cells Migrating in Confined SpaceTamara Hill¹, Turki Almugaiteeb¹, Qionghua Shen¹, and Young-Tae Kim¹
¹University of Texas at Arlington, Arlington, TX

TH-813

Biocompatibility of Insulin and Insulin Subcomponents in Modified "Air Pouch" Model of Continuous Subcutaneous Insulin Infusion (CSII)Chafica Kesserwan¹, Yi Qiao², Donald Kreutzer², and Ulrike Klueh¹
¹Wayne State University, Detroit, MI, ²University of Connecticut, Farmington, CT

Track: Tissue Engineering, Neural Engineering

Neural and Neurovascular Tissue Engineering

TH-814

Development of a 3D Human Brain Microtissue Model For Disease, Drug And Toxicity TestingAurora Washington¹, Taylor Pullinger¹, Liane Livi¹, and Diane Hoffman-Kim¹
¹Brown University, Providence, RI

TH-815

RGD Functionalized Nanofibers Increase Neural Differentiation of Mouse Embryonic Stem CellsDiana Philip¹, Elena Silantyeva¹, Wafaa Nasir¹, Matthew Becker¹, and Rebecca Willits¹
¹The University of Akron, Akron, OH

TH-816

Nerve-Muscle Co-Culture on a 3D Polymeric Scaffold for Potential Tissue Engineering Applications

Suradip Das^{1,2}, Kritika Katiyar^{1,2,3}, Justin Burrell^{1,2}, Foteini Mourkioti¹, and Daniel Cullen^{1,2}

¹University of Pennsylvania, Philadelphia, PA, ²CMC VA Medical Center, Philadelphia, PA, ³Drexel University, Philadelphia, PA

TH-817

Templated Extracellular Matrix-Based Hydrogel for Peripheral Nerve Regeneration in a Tissue-Engineered Electronic Nerve Interface (TEENI)

Benjamin Spearman¹, Eric Atkinson¹, Sahba Mobini¹, Cary Kuliasha¹, Elizabeth Nunamaker¹, Kevin Otto¹, Carlos Rinaldi¹, Jack Judy¹, and Christine Schmidt¹

¹University of Florida, Gainesville, FL

TH-818

Single-Step Co-Axial Extrusion (SS-CAE) for Construction of Human 3D Blood-Brain Barrier Model in 3D

Isaac Wetzel¹ and Hansang Cho¹

¹University of North Carolina at Charlotte, Charlotte, NC

TH-819

Three-dimensional Microfluidic Brain Microphysiological System for High-throughput Toxicity Screening

Lumei Liu¹, Youngmi Koo^{1,2}, Teal Russell¹, Elaine Gay³, Daniel Laskowitz⁴, and Yeoheung Yun¹

¹North Carolina A&T State University, Greensboro, NC, ²WENeoBio Co., Gunsan-Si, Korea, Republic of, ³Center for Drug Discovery, RTI international, Durham, NC, ⁴Duke University, Durham, NC

TH-820

Schwan Cell Response to PEGDA Hydrogels

Carlisle DeJulius¹, Matthew Becker¹, and Rebecca Willits¹

¹The University of Akron, Akron, OH

TH-821

Bottom-up Engineering Genetically Tractable 3D Neural Tissues to Model the Brain

Halil Tekin¹, Sean Simmons¹, Beryl Cummings¹, Linyi Gao¹, Xian Adiconis¹, Cindy Hession¹, Ayan Ghoshal¹, Danielle Dionne¹, Sourav Choudhury¹, Volkan Yesilyurt¹, Neville Sanjana¹, Xi Shi¹, Congyi Lu¹, Matthias Heidenreich¹, Jen Pan¹, Joshua Levin¹, and Feng Zhang¹

¹Broad Institute of MIT and Harvard, Cambridge, MA

TH-822

Repeated Flex μ CEA Stimulation Induced and Maintained Reduced MAP at Multiple Locations along the CPN

Zakia Mizan¹, Nick Acevedo¹, Shu Kang¹, Erick Dominguez², Vivana Casas Iberico¹, Ryan Landrith³, Caleb Nothnagle³, Qionghua Shen¹, Muthu Wijesyndara³, and Young-Tae Kim¹

¹University of Texas at Arlington, Arlington, TX, ²University of El Paso, El Paso, TX, ³University of Texas at Arlington Research Institute, Fort Worth, TX

Track: Neural Engineering

Neural Cell Model Systems

TH-823

3-D Geometry and Irregular Connectivity Dictate Neuronal Firing in Frequency Domain and Synchronization

Tanchen Ren¹, Bianca Grosshäuse^{1,2}, Kaushik Sridhar¹, Thomas Nieland¹, Alessandro Tocchio¹, Ute Schepers², and Utkan Demirci¹

¹Stanford University, Palo Alto, CA, ²Karlsruhe Institute of Technology, Eggenstein-Leopoldshafen, Germany

TH-824

Investigating the Internal Responses of Neurons and Neuron-like Cells to External Electric Fields

Kate O'Neill¹, Sylvester Gates III¹, Phillip Alvarez¹, Yuan Wang², Houpu Li², Quan Qing², Gloria Ortiz³, Evan Miller³, Stephan Brenowitz¹, and Wolfgang Losert¹

¹University of Maryland College Park, College Park, MD, ²Arizona State University, Tempe, AZ, ³University of California Berkeley, Berkeley, CA

TH-825

Aberrant Astrocyte Metabolism Following High-Rate Insult Involves Mechanical and Cellular Influences

Nora Hlavac¹ and Pamela VandeVord^{1,2}

¹Virginia Tech, Blacksburg, VA, ²Salem Veterans Affairs Medical Center, Salem, VA

TH-826

Beta Amyloid Internalization is Mediated By $\alpha 7\beta 2$ nACh Receptors and Contributes to Cell Death

Kayla Ponder¹, Grace Williams¹, Bryant Hollins¹, and Teresa Murray¹

¹Louisiana Tech University, Ruston, LA

TH-827

In Vitro Embryonic Stem Cell-Derived Neuromuscular Junction on a Microfluidic Platform

Jae Won Lee¹ and Shelly Sakiyama-Elbert¹

¹University of Texas at Austin, Austin, TX

TH-828

Engineering Multicellular Human Brain Model and Assessing Adverse Toxicity of BoNT/A Leading to Synaptic Impairment in Alzheimer's Disease

Ghuncha Ambrin¹, Cai Showei², Bal Ram Singh³, and Cho Hansang⁴

¹University of Massachusetts Dartmouth, University of North Carolina, Charlotte, N. Dartmouth, MA, ²University of Massachusetts Dartmouth, N. Dartmouth, MA, ³Institute of Advanced Sciences, N. Dartmouth, MA, ⁴University of North Carolina, Charlotte, Charlotte, NC

TH-829

Long-Term Functional Neuromuscular Junction (NMJ) on an Electrospun Nanofiber-Assisted Dish

Baiwen Luo¹, Nuan Chen^{1,2}, Seeram Ramakrishna², In Hong Yang^{1,3}, and Nitish Thakor^{1,3}

¹Singapore Institute for Neurotechnology, National University of Singapore, Singapore, Singapore, ²Department of Mechanical Engineering, National University of Singapore, Singapore, Singapore, ³Department of Biomedical Engineering, School of Medicine, Johns Hopkins University, Baltimore, MD

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Track: Neural Engineering

Peripheral Nerve Stimulation and Repair

TH-830

Electrical Characterization of Nerve Cuffs or Electrodes for Neuroscience Applications

Omid Haji Maghsoudi¹, Annie Vahedipour¹, Tommy Hallowell¹, Shaun George¹, Benjamin Robertson¹, and Andrew Spence¹
¹Temple University, Philadelphia, PA

TH-831

In Situ Polymerized PEDOT Electrodes for Peripheral Nerve Interfaces

Jamie Murbach¹, Yuxin Tong², Shrirang Chhatre³, Vivek Subramanian³, Blake Johnson², David Martin³, and Kevin Otto¹
¹University of Florida, Gainesville, FL, ²Virginia Tech, Blacksburg, VA, ³University of Delaware, Newark, DE

TH-832

Ultrasound-induced Morphological Changes in DRG Neurons in Coculture with Schwann Cells

Dan Ventre¹
¹Northeastern University, Boston, MA

TH-833

Peripheral Nerve Repair Using Tissue Engineered "Living Scaffolds" Promotes Survival of Spinal Cord Motor Neurons

Joseph Maggiore^{1,2}, Justin Burrell^{1,2}, Kevin Browne^{1,2}, Kritika Katiyar^{1,2,3}, and D. Kacy Cullen^{1,2}
¹University of Pennsylvania, Philadelphia, PA, ²CMC VA Medical Center, Philadelphia, PA, ³Drexel University, Philadelphia, PA

TH-834

Evaluating Sensory Percepts Elicited by Macrosieve Stimulation: A Rat Behavioral Model

Nikhil Chandra¹, Weston McCarron², Harold Burton², Leonard Green¹, Daniel Moran¹, Wilson Ray², and Matthew MacEwan²
¹Washington University in St. Louis, St. Louis, MO, ²Washington University School of Medicine, St. Louis, MO

TH-835

Electrical Stimulation of Hyaluronic Acid-CNT Nanofibers Results in Increased Neurite Outgrowth

Elisabeth Steel¹, Mallak Taleb¹, Jean-Yves Azar¹, and Harini Sundararaghavan¹
¹Wayne State University, Detroit, MI

TH-836

Injectable Micro-Tissue Engineered Nerve Grafts to Maintain the Pro-Regenerative Environment of the Distal Nerve Sheath Following Major Peripheral Nerve Injury

Justin C. Burrell^{1,2}, Suradip Das^{1,2}, Kritika S. Katiyar^{1,2,3}, Franco A. Laimo^{1,2}, Zarina Ali¹, and D. Kacy Cullen^{1,2}
¹University of Pennsylvania, Philadelphia, PA, ²CMC VA Medical Center, Philadelphia, PA, ³Drexel University, Philadelphia, PA

TH-837

Release of Therapeutics from Porous Silicon/PLGA Nanofibers Enhances Neurite Extension

Jonathan Zuidema¹, Courtney Dumont^{2,3}, Jinyoung Kang¹, Alessandro Bertucci¹, Lonnie Shea², and Michael Sailor¹
¹University of California San Diego, La Jolla, CA, ²University of Michigan, Ann Arbor, MI, ³University of Miami, Coral Gables, FL

Track: Nano and Micro Technologies, Tissue Engineering

Organ-on-Chip for Regenerative Medicine

TH-838

Engineering Small-scale Perfused Vascularized Adipose Tissues

Xuanyue Li¹, Calin Nicolescu¹, Miles Massidda¹, Jingyi Xia¹, Tyler Ryan¹, and Joe Tien¹
¹Boston University, Boston, MA

TH-839

Adipogenic Differentiation and Characterization of Primary Murine Adipocytes on Chip

Nida Tanataweethum¹, Adelyn Zelaya¹, Feipeng Yang¹, Ronald Cohen², Eric Brey³, and Abhinav Bhushan¹
¹Illinois Institute of Technology, Chicago, IL, ²The University of Chicago, Chicago, IL, ³University of Texas at San Antonio, San Antonio, TX

TH-840

Long-term 2D and 3D Human Liver Models with Hepatocytes and Liver Fibroblasts

Grace Brown¹, Brenton Ware¹, and Salman Khetani¹
¹University of Illinois at Chicago, Chicago, IL

TH-841

Bone Marrow-on-a-Chip: An In Vitro Model for Human Hematopoietic Stem Cell Maintenance, Proliferation, and Differentiation

Drew Glaser¹, Natalie Ng², Leif Anderson³, Aravind Anand³, Alyssa Deely³, Daniel Link², Katherine Weilbaeher², and Steven George³
¹UC Davis, Sacramento, CA, ²Washington University, Saint Louis, MO, ³University of California, Davis, Davis, CA

TH-842

Using Hydrogel-coated Microfluidic Devices to Investigate the Effects of Substrate Mechanical Properties and Local Volume on Hepatic Stellate Cell Activation

Pouria Fattahi¹, Jiahui Li¹, Gulnaz Stybayeva¹, Meng Yin¹, and Alexander Revzin¹
¹Mayo Clinic, Rochester, MN

TH-843

Investigating the Effect of Pericytes on Vascularization In Vitro

Scott Erickson¹, Yukako Teraoka¹, Yuji Nashimoto², Yuichiro Arima³, Sanshiro Hanada³, Hidetoshi Kotera¹, Koichi Nishiyama³, Takashi Miura⁴, Ryuji Yokokawa¹, and Scott Erickson¹
¹Kyoto University, Kyoto, Japan, ²Tohoku University, Sendai, Japan, ³Kumamoto University, Kumamoto, Japan, ⁴Kyushu University, Fukuoka, Japan

TH-844

Control of Intestinal Barrier Dysfunction Orchestrates the Onset of Proinflammatory Crosstalk in a Pathomimetic Gut Inflammation-on-a-chip

Woojung Shin¹ and Hyun Jung Kim¹
¹The University of Texas at Austin, Austin, TX

TH-845

Optimization of Lung Airway Organoids for Physiological Modeling

Tim Leach^{1,2}, Dipasri Konar², Uma Gandhi², Shiny Rajan^{1,2}, Adam Hall², Anthony Atala², and Sean Murphy²
¹Wake Forest School of Medicine, Winston-Salem, NC, ²Wake Forest Institute for Regenerative Medicine, Winston-Salem, NC

TH-846

Development of Brain Microvascular Niche on a Chip

Max Winkelman¹ and Guohao Dai¹
¹Northeastern University, Boston, MA

TH-847

Integrating Unidirectional Perfusion for Shear Stress-Sensitive Tissues Into Pumpless Body-On-A-Chip Systems

Ying Wang¹ and Michael Shuler^{1,2}
¹Cornell University, Ithaca, NY, ²Hesperos, Orlando, FL

TH-848

Interactive Tissue Patterning through Spatially-Defined Addressable Delivery of Growth Factors

Nhat Anh Nguyen Tong¹, Quang Long Pham¹, Paul Abatemarco¹, Vatsal Shah¹, and Roman Voronov¹
¹New Jersey Institute of Technology, NEWARK, NJ

TH-849

Dual Scale Porous Ultrathin Membranes for Vasculature Barrier Modeling

Alec Salminen¹, Jingkai Zhang¹, Greg Madejski¹, Tejas Khire¹, Richard Waugh¹, James McGrath¹, and Thomas Gaborski²
¹University of Rochester, Rochester, NY, ²Rochester Institute of Technology, Rochester, NY

TH-850

Human iPSC-derived Liver-microphysiological Systems for Drug Development

Caleb Lee¹, Felipe Lee-Montiel¹, Alexander Laemmler², Brian Siemons¹, Holger Willenbring², and Kevin Healy¹
¹University of California at Berkeley, Berkeley, CA, ²University of California at San Francisco, San Francisco, CA

TH-851

A 3D Printed Microfluidic Bioreactor to Engineering Biphasic Musculoskeletal Construct

Riccardo Gottardi^{1,2}, Giulio De Riccardis³, Martina Avolio³, Derek Nichols¹, Inderbir Sondh¹, Alessandro Piroso¹, Peter Alexander¹, Manuela Raimondi³, and Rocky Tuan¹
¹University of Pittsburgh, Pittsburgh, PA, ²Ri.MED Foundation, Palermo, Italy, ³Politecnico di Milano, Milano, Italy

TH-852

Development of a Dry Processing Technique for Mammalian Cells

Jason Solocinski¹, Quinn Osgood², Oleg Zikanov¹, and Nilay Chakraborty¹
¹University of Michigan Dearborn, Dearborn, MI, ²OtziBio LLC, Dearborn, MI

TH-853

New Approach for Wound Healing Study using Skin-On-Chip: Simulating Inflammation with Macrophages

Sahar Biglari¹, Thi Yen Loan Le¹, Richard Tan², Steve Wise², Alessandro Zambon³, Gaia Codolo³, Marina De Bernard³, Majid Warkiani⁴, Sina Naficy¹, and Fariba Dehghani¹
¹University of Sydney, The University of Sydney, Australia, ²Heart Research Institute, Sydney, Australia, ³University of Padua, Padua, Italy, ⁴University of Technology of Sydney, Sydney, Australia

TH-854

Engineering a Microphysiological System to Recapitulate Pulmonary Sarcoidosis Pathophysiology

Matthew Ishahak¹, Siddarth Rawal¹, Annie Bowles¹, Jason Zhang², Mehdi Mirsaedi^{1,2}, and Ashutosh Agarwal¹
¹University of Miami, Miami, FL, ²Miami VA Medical Center, Miami, FL

TH-855

Three-Dimensional Nanodevice Arrays for Exploring Electrophysiology of Microscale Electrogenic Tissues

Anna Kalmykov¹, Changjin Huang¹, Arif Abdullah², Elnatan Mataev¹, K. Jimmy Hsia¹, and Tzahi Cohen-Karni¹
¹Carnegie Mellon University, Pittsburgh, PA, ²University of Illinois, Urbana-Champaign, Urbana, IL

TH-856

Formation of Epithelial Tubes from Human Mammary Epithelial Cell Lines

Usman Ghani¹, Chao Liu¹, and Joe Tien¹
¹Boston University, Boston, MA

Track: Nano and Micro Technologies

Nano and Micro Technologies-Other/Non-specified

TH-857

Nanocomposite Coating for Enhanced Osseointegration and Antibacterial Activity

Carina Russell¹, Chiara Rinoldi², Azadeh Mostafavi¹, Ali Tamayol¹, Wojciech Swieszkowski², Alireza Moshaverinia³, and Bingyun Li⁴
¹University of Nebraska-Lincoln, Lincoln, NE, ²Warsaw University of Technology, Warsaw, Poland, ³University of California-Los Angeles, Los Angeles, CA, ⁴West Virginia University, Morgantown, WV

TH-858

Predicting Interaction Strength of Potential Landscapes Using A Machine Learning Approach

Ahmad Haider¹, Alan Liu¹, and Todd Sulchek¹
¹Georgia Institute of Technology, Atlanta, GA

TH-859

“Microfluidic Thermometers” for Analyzing Biomedical Samples

Brittney A. McKenzie¹ and William H. Grover¹
¹University of California-Riverside, Riverside, CA

TH-860

Exploring Coupling Strength and Sensitivity to Disorder in a Coupled Cantilever Array

Jules Zapanta¹ and Teresa Ryan¹
¹East Carolina University, Greenville, NC

TH-861

Microfluidic Device with Embedded Microporous Nylon Membranes for Efficiently Filtering and Dissociating Digested Tissue into Single Cells

Xiaolong Qiu¹, Jeremy Lombardo¹, Trisha Westerhof², Marissa Pennell¹, Edward Nelson¹, Elliot Hui¹, and Jered Haun¹
¹University of California, Irvine, Irvine, CA, ²University of Michigan, Irvine, CA

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TH-862

Study on Bioactive Materials Incorporated PLGA Nano/micro-scale Particles for Facilitating Wound Healing ProcessHong Jin Choi¹, Gi Tae Park¹, and Jeong Koo Kim¹
¹Inje University, Gimhae-si, Gyeongsangnam-do, Korea, Republic of

Track: Translational Biomedical Engineering

Preclinical Models, GMP, GLP, FDA, and Unexpected Challenges

TH-863

Biomimetic Integration of Multiple Engineered Tissues of High Biological Fidelity to Enable Human-On-A-Chip Models of Toxicity and DiseaseKacey Ronaldson-Bouchard¹, Keith Yeager¹, Diogo Teles¹, Alan Chramiec¹, Manuel Tamargo¹, Yanne Doucet¹, Hasan Erbil Abaci¹, Zongyou Guo¹, Angela Christiano¹, Karen Hirschi², Christopher Chen³, and Gordana Vunjak-Novakovic¹
¹Columbia University, New York, NY, ²Yale University, New Haven, CT, ³Boston University, Wyss Institute, Boston, MA

TH-864

Prevention of Rodent Wound Splint Removal Via a Low Stress DeviceJade Montgomery^{1,2}, Linda Jourdan², and Robert Gourdie^{1,2}
¹Virginia Tech, Blacksburg, VA, ²Virginia Tech Carilion Research Institute, Roanoke, VA

TH-865

Advancing Feedback and Feedforward Control to Obtain the Ultimate Artificial PancreasDerrick Rollins¹ and Yong Mei¹
¹Iowa State University, Ames, IA

Track: Tissue Engineering

Printing and Patterning in Tissues

TH-866

Tuning the Degradation Rate of Elastic PEG-PCL-DA Hydrogel using MMP-cleavable LinkersWenhan Lee¹, Cancan Xu^{2,3}, Yi Hong^{2,3}, and Guohao Dai¹
¹Northeastern University, Boston, MA, ²University of Texas at Arlington, Arlington, TX, ³University of Texas at Arlington and the University of Texas Southwestern Medical Center, Dallas, TX

TH-867

Improved Control Over Nanofiber Deposition Achieved with a Combinatorial Electrospinning ApparatusMaximilian Sonntag¹, Maheshinie Rajapaksha², and Joanna Thomas¹
¹Mercer University, Macon, GA, ²Mercer University, Savannah, GA

TH-868

Sacrificial Bioprinting for Fabricating Tissue Constructs with Perfusion ChannelsPrabhuti Kharel¹, Rahmatul Mahmoud¹, Kishen Mitra², and Kunal Mitra¹
¹Florida Tech, Melbourne, FL, ²West Shore Jr. Sr. High School, Melbourne, FL

Track: Translational Biomedical Engineering

Prototype Clinical Evaluation

TH-869

Clinical Validation of the Program for Improving and Managing the Environment Sleep Monitoring SystemRana Zadeh¹, Po-Cheng Chen¹, Benyamin Davaji¹, Paul Eshelman¹, Amit Lal¹, Leanna Pancoast¹, Hessam Sadatsafavi¹, Erik Zavrel¹, and Ana Krieger²
¹Cornell University, Ithaca, NY, ²Weill Cornell Medicine, New York, NY

TH-870

Validation of a Wireless Intraoperative Neuro-monitoring SystemWenyuan Shi¹, Patty Rampy², Steven Sparagana², Dan Sucato², and J-C Chiao¹
¹University of Texas at Arlington, Arlington, TX, ²Texas Scottish Rite Hospital for Children, Dallas, TX

TH-871

Mechanical Testing of a Novel Anterior Compliant Mechanism Vertebral ClampArianna J Reay¹, Aubrie Taylor¹, and Anton Bowden¹
¹Brigham Young University, Provo, UT

TH-872

FE Modeling and Validation of a Novel Anterior Compliant Mechanism Vertebral ClampPhillip Ng¹, Aubrie Taylor¹, Arianna J Reay¹, and Anton Bowden¹
¹Brigham Young University, Provo, UT

TH-873

Pupillary Light Reflex in Young Children with High-risk of AutismClare Kercher¹, Leila Azinfar¹, Gang Yao¹, Dinalankara M. R. Dinalankara¹, Judith H. Miles¹, and T. Nicole Takahashi¹
¹University of Missouri-Columbia, Columbia, MO

TH-874

Wearable Brain Fatigue DetectorShervin Abdollahi¹
¹George Mason University, Burke, VA

Track: Orthopedic and Rehabilitation Engineering, Neural Engineering

Rehabilitation: Blast Injury and Spinal Cord Injury

TH-875

Improvement in Accuracy of Regression Estimates of VO₂ by From Wireless Sensors by Incorporating Muscle (EMG) Sensor DataJames Enciso¹, Isaac Bowser¹, James Velasco¹, Jackson Tu¹, Ellie Tjara¹, and Deborah Won¹
¹California State University, Los Angeles, Los Angeles, CA

TH-876

The Effect of Antioxidant- and Vitamin-Enriched Diets on Vision in Rats Exposed to Primary Blast Injury

Cara Motz¹, Rachael S. Allen¹, Andrew Feola^{1,2}, Damian M. Daszynski³, Theodor A. Woolman³, Peter Kador³, Sriganesh Ramachandra Rao⁴, Steven J. Fliesler^{4,5}, and Machelie T Pardue^{1,2}
¹Atlanta VA Center for Visual and Neurocognitive Rehabilitation, Decatur, GA, ²Georgia Institute of Technology, Atlanta, GA, ³University of Nebraska Medical Center, College of Pharmacy, Omaha, NE, ⁴SUNY-University at Buffalo, Buffalo, NY, ⁵VA Western NY Healthcare System, Buffalo, NY

TH-877

Feedback Controlled Advanced Stimulation Paradigms Prolong Moment Output with Neural Stimulation after Spinal Cord Injury

Kristen Gelenitis¹, Max Freeberg¹, and Ronald Triolo¹
¹Case Western Reserve University, Cleveland, OH

Track: Neural Engineering

Repair and Regeneration of the Injured Brain

TH-878

A Tissue-Engineered Rostral Migratory Stream for Directed Neuronal Replacement

John O'Donnell^{1,2}, Kate Panzer^{1,2}, Kaila Helm^{1,2}, Kritika Katiyar^{1,2,3}, Kevin Browne^{1,2}, Wisberty Gordián-Vélez^{1,2}, and D. Kacy Cullen^{1,2}
¹Corporal Michael J. Crescenz Veterans Affairs Medical Center, Philadelphia, PA, ²University of Pennsylvania, Philadelphia, PA, ³Drexel University, Philadelphia, PA

TH-879

Neural Network Vulnerability to Patterned Neurodegeneration: A Computational Approach to Neural Injury

David Gabrieli¹, Brandon Parvesse¹, Samantha Schumm¹, and David Meaney¹
¹University of Pennsylvania, Philadelphia, PA

TH-880

Three-Dimensional Human Axon Tracts Derived from Cerebral Organoids

D. Kacy Cullen^{1,2,3}, Laura A. Struzyna^{1,2,3}, Dennis Jgamadze^{2,3}, Wisberty J. Gordián-Vélez^{1,2,3}, James Lim^{2,3}, Kathryn L. Wofford^{2,3,4}, and H. Isaac Chen^{2,3}
¹Department of Bioengineering, University of Pennsylvania, Philadelphia, PA, ²Department of Neurosurgery, University of Pennsylvania, Philadelphia, PA, ³Center for Neurotrauma, Neurodegeneration & Restoration, CMC VA Medical Center, Philadelphia, PA, ⁴School of Biomedical Engineering, Science and Health Systems, Drexel University, Philadelphia, PA

TH-881

Nanotechnology-Based Cell and Extracellular Vesicle Therapies for Acute Neurologic Injury

Natalia Higueta-Castro¹, Jordan Moore¹, Maria Balch¹, Hallie N. Harris¹, William Laurence¹, Richard Steward¹, Alec Sunyecz¹, Chandan K. Sen¹, Savita Khanna¹, Cameron Rink¹, and Daniel Gallego-Perez¹
¹The Ohio State University, Columbus, OH

Track: Neural Engineering

Spinal Cord Tissue Engineering & Repair

TH-882

Glycosaminoglycan Mimetic Aligned Fibrous Scaffolds for Spinal Cord Repair

Sharareh Hashemi¹ and Treena Livingston Arinze¹
¹New Jersey Institute of Technology, Newark, NJ

TH-883

Fingolimod-Loaded Electrospun Fibers Promote Enhanced Neurite Extension

Devan Puhl¹, Anthony D'Amato¹, Slade Glavish¹, and Ryan Gilbert¹
¹Rensselaer Polytechnic Institute, Troy, NY

TH-884

Injectable, Magnetically-aligned Electrospun Fiber Conduits for Neural Guidance

Jessica Funnell¹, Christopher Johnson¹, and Ryan Gilbert¹
¹Rensselaer Polytechnic Institute, Troy, NY

TH-885

Laminin Coating Electrospun Poly-L-lactic Acid Fibers Masks the Effects of Surface Nanotopography on Neurite Outgrowth

Alexis Ziembra¹, Anthony D'Amato¹, Devan Puhl¹, Janneke Doedee¹, Christopher Johnson¹, Jonathan Bao¹, and Ryan Gilbert¹
¹Rensselaer Polytechnic Institute, Troy, NY

TH-886

A Hyaluronic Acid Hydrogel Platform to Screen Bioactive Cues for Spinal Cord Injury Repair

Emi Kiyotake¹, Susan Nimmo¹, Handan Acar¹, Michael Martin², and Michael Detamore¹
¹University of Oklahoma, Norman, OK, ²University of Oklahoma Health Science Center, Oklahoma City, OK

Track: Orthopedic and Rehabilitation Engineering, Neural Engineering

Spine and Intervertebral Disc

TH-887

Measurement of Kinematics of Cervical Vertebrae Using Motion Capture

Marketa Marcanikova¹, Nisha Gulhane¹, Moh'd Jaradat¹, and Melinda Harman¹
¹Clemson University, Clemson, SC

TH-888

A Pilot Study to Quantify the Effects of Convection on Nutrient Transport to the Intervertebral Disc

Elizabeth Capogna^{1,2}, Alton Daley², Jennifer Vincent^{1,2}, Dali Alarian^{1,2}, Sean Glennon^{2,3}, and Eric Ledet^{1,2}
¹Rensselaer Polytechnic Institute, Troy, NY, ²Stratton VA Medical Center, Albany, NY, ³Union College, Schenectady, NY

Thursday, October 18 | 9:30 am–5:00 pm | GWCC Exhibit Hall

Poster Viewing with Authors & Refreshment Break | 9:30 am–10:15 am and 3:00 pm–3:45 pm

TH-889

Functional Seated Vertical Traction for Rehydration Promotion in Lumbar Intervertebral Discs

Marit Johnson¹, Adam Piper¹, and Joy Karges²
¹South Dakota School of Mines & Technology, Rapid City, SD,
²University of South Dakota, Vermillion, SD

TH-890

A Comparison of Common Spinal Rods Utilizing Static 4-point Bending Per ASTM F2193

Zachary Dooley¹ and Vamshi Muvvala¹
¹SeaSpine Inc., Carlsbad, CA

TH-891

Design and Validation of 3D Printed Spinal Vertebral Phantoms for Medical Education

Garrett Ung¹, Hanbiehn Kim¹, Rafael de la Tijera Obert¹, Tianyue Liang¹, Rajiv Iyer², Mari Groves², and Amir Manbachi¹
¹Johns Hopkins University, Baltimore, MD, ²Johns Hopkins Medicine, Baltimore, MD

TH-892

A Quantitative Study of the Effect of Osteoporotic Compression Fractures on Thoracic Volume by Virtual Patients

Po-Chih Lee¹, Arthur Erdman¹, Charles Ledonio², and David Polly¹
¹University of Minnesota, Minneapolis, MN, ²Innovative Surgical Designs, Inc, Wayne, PA

Track: Orthopedic and Rehabilitation Engineering

Bone

TH-893

Rib Cortical Thickness Variation with Age and Sex from Clinical Computed Tomography Scans

Zachary Hostetler^{1,2}, Sarah Fanning^{1,2}, Joel Stitzel^{1,2}, and Ashley Weaver^{1,2}
¹Virginia Tech-Wake Forest University, Winston-Salem, NC, ²Wake Forest University School of Medicine, Winston-Salem, NC

TH-894

Robotic Evaluation of Orthopaedic Surgeons During Bone Drilling

Naghme Zahmani¹, Ashkan Pourkand², Deana Mercer³, Christina Salas³, and David Grow¹
¹New Mexico Tech, Socorro, NM, ²University of Utah, Salt Lake city, UT,
³University of New Mexico, Albuquerque, NM

TH-895

Bacteriophage Efficacy Against Staphylococcus aureus In Vitro and Establishment of an In Vivo Osteomyelitis Model

Leah Horstemeyer¹, Keun Seo², Joo Youn Park², Elizabeth Swanson², Seongbin Park², and Lauren Priddy¹
¹Mississippi State University, Mississippi State, MS, ²College of Veterinary Medicine, Mississippi State University, Mississippi State, MS

Track: Orthopedic and Rehabilitation Engineering

Orthopedic and Rehabilitation Engineering—Other/Non-specified

TH-896

Clinical Outcomes in Athletes Treated with Wearable Low-intensity Ultrasound.

Eric Rohrs¹ and George Lewis¹
¹ZetrOZ Systems, LLC, Trumbull, CT

TH-897

Wear and Corrosion in Aseptic Loosening of TKR: A Retrieval Study

Heath Baskin¹, Elie Ghanem¹, Jack Lemons¹, and Alan Eberhardt¹
¹University of Alabama at Birmingham, Birmingham, AL

TH-898

Epidemiological Estimates of Barriers to Participation in Adaptive Sports

Jacey Roy¹, Lindsay Ramey², Jason Smith², and Nicholas Fey^{1,2}
¹The University of Texas at Dallas, Richardson, TX, ²University of Texas Southwestern Medical Center, Dallas, TX

TH-899

Goal Oriented Tracking in an Variable Visibility Environment: EMG Linked Visual Feedback

Joel Mintz^{1,2}, Dalia De Santis^{1,2}, Ali Farshchiansadegh^{1,2}, Fabio Rizzoglio^{1,2,3}, and Sandro Mussa-Ivaldi^{1,2}
¹Northwestern University, Chicago, IL, ²Shirley Ryan Ability Lab, Chicago, IL, ³Università degli Studi di Genova, Genova, Italy

TH-900

An In-Vitro Pressure Mapping Evaluation of Fuzzy Wale Compression with Multi-Layered Compression

Kyle Walker¹, Cameron Bailey¹, Suzie Ehmann², and John DesJardins¹
¹Clemson University, Clemson, SC, ²Carolinas Healthcare System Stanly, Albemarle, NC

Track: Stem Cell Engineering, Tissue Engineering

Stem Cells in Tissue Engineering

TH-901

Cell-Matrix Interactions Regulate the Vasculogenic Potential of Human iPSC-Derived Vascular Progenitor Cells

Cody Crosby¹, Deepti Valliappan¹, Chengyi Tu¹, and Janet Zoldan¹
¹The University of Texas at Austin, Austin, TX

TH-902

Alginate Encapsulated Mesenchymal Stromal Cells for Osteoarthritis Treatment

Ileana Marrero-Berrios¹, Sarah Salter¹, Charles Rabolli¹, Rene Schloss¹, and Martin Yarmush¹
¹Rutgers, The State University of New Jersey, Piscataway, NJ

TH-903

Design Considerations for 3D-Printed Polystyrene: Surface Chemistry and Protein Deposition

Max Lerman^{1,2,3}, Shin Muramoto², Navein Arumugasaamy^{1,3,4}, Michael Van Order¹, Josephine Lembong^{1,3}, Anushka Gerald^{1,3}, James Fookes^{1,3}, Greg Gillen², and John Fisher^{1,3}

¹University of Maryland, College Park, MD, ²National Institute of Standards and Technology, Gaithersburg, MD, ³Center for Engineering Complex Tissues, College Park, MD, ⁴Children's National Health System, Washington, DC

TH-904

PDGF-driven Differentiation of Adipose-derived Stem Cells into Fibroblasts for Use in Tunica Adventitia Layer of Vascular Grafts

Ashley Apil¹ and Mai Lam¹

¹Wayne State University, Detroit, MI

TH-905

Human Mesenchymal Stem Cell Chondrogenic Matrix Regulation by Inorganic Phosphate

Kevin Miles¹, Gerald Calcaterra¹, and Rhima Coleman¹

¹University of Michigan, Ann Arbor, MI

TH-906

Gelatin Layer-by-layer on Hydrolyzed PCL Nanofibrils Matrix for Cell Cultivation.

Ji Un Shin¹, Wei Mao¹, Young Ju Son¹, Sol Lee¹, Ju Won Lee¹, and Huyk Sang Yoo¹

¹Kangwon University, Chuncheon, Korea, Republic of

TH-907

3D Co-Culture System of HSPCs and Stromal Cells to Recapitulate the Bone Marrow Niche

Daniel Tavakol¹, Josefine Tratwal¹, Fabien Bonini², Martina Genta¹, Patrick Burch¹, Amélie Béduer^{1,2}, Thomas Braschler^{1,2}, and Olaia Naveiras¹

¹Ecole Polytechnique Federale de Lausanne, Lausanne, Switzerland, ²University of Geneva, Geneva, Switzerland

TH-908

An Autologous 3D Microphysiological System for Personalized Medicine Applications

Matthew Curtis¹, Yosuke Kurokawa¹, and Steven George¹

¹University of California, Davis, Davis, CA

TH-909

Aptamer-mediated Differentiation of Adipose Derived Stem Cells into Endothelial Cells

Ceran Messam¹, Hilary Cunkle¹, and Josephine Allen¹

¹University of Florida, Gainesville, FL

TH-910

Fabrication of a Mineral Gradient Containing Bone Matrix Scaffold and Its Biocompatibility towards Mesenchymal Stem Cells

Hao Zhou¹, Alexander Boys¹, Jordan Harrod¹, Lawrence Bonassar¹, and Lara Estroff¹

¹Cornell University, Ithaca, NY

TH-911

Engineering of Corneal Collagen Architecture by Protein Guided Alignment of Stem Cells

Santiago Carrasquilla¹, Rachelle Palchesko¹, James Funderburgh², and Adam Feinbergh¹

¹Carnegie Mellon University, Pittsburgh, PA, ²University of Pittsburgh, Pittsburgh, PA

TH-912

3D Hydrogel Scaffold for Cartilage Tissue Engineering Using Synovium Derived Mesenchymal Stem Cells

Sara katebifar¹, Wendy Vanden Berg-Foels¹, and Devina Jaiswal²

¹University of Connecticut, Storrs, CT, ²University of Connecticut, Storrs, CT

TH-913

Cell Population Balance of Cardiovascular Spheroids Derived from Human Induced Pluripotent Stem Cells

Julie Bejoy¹, Yuanwei Yan², and Yan Li¹

¹FAMU-FSU College of Engineering, Tallahassee, FL, ²University of Wisconsin-Madison, Madison, WI

TH-914

Effect of Pulsed Electromagnetic Fields on the Human Mesenchymal Stem Cells using 3D Magnetic Scaffolds

Alyaa Aldebs¹, Nasim Nosoudi¹, and Jaime E Ramirez-Vick¹

¹Wright State University, Dayton, OH

TH-915

Shear Stress in Spinner Flask Bioreactor Can Affect the Immune-regulatory Abilities of MSCs by Altering Energy Metabolic Phenotype.

Shaquille Lewis¹, Teng Ma², and Xuegang Yuan²

¹Florida A & M University, Tallahassee, FL, ²Florida State University, Tallahassee, FL

TH-916

Alteration of Nuclear Morphology during Adipogenic Differentiation

Andrew McColloch¹, Parisa Rabbani¹, and Michael Cho¹

¹University of Texas at Arlington, Arlington, TX

TH-917

Engineer 3D Brain Microvascular Network Directly from Human Pluripotent Stem Cells

Taylor Dorsey¹ and Guohao Dai¹

¹Northeastern University, Boston, MA

TH-918

Fate of Human Mesenchymal Stem Cells In Prevascularized Cell Sheet

Wenkai Jia¹, Qi Xing¹, Dhavan Sharma¹, and Feng Zhao¹

¹Michigan Technological University, Houghton, MI

TH-919

Assessing the Ability of Human Induced Pluripotent Stem Cell Derived Endothelial Cells To Form Functional Microvasculature *In Vivo*

Jonathan Bezenah¹, Ana Rioja¹, Benjamin Juliar¹, Nicole Friend¹, and Andrew Putnam¹

¹University of Michigan, Ann Arbor, MI

TH-920

Neonatal Articular Cartilage as a Novel Molecular Target to Assess and Modify Mesenchymal Stem Cell-Chondrogenesis

Rodrigo Somoza¹, Daniel Vail¹, Amhad Khalil¹, and Arnold Caplan¹

¹Case Western Reserve University, Cleveland, OH

TH-921

Muscle Stem Cell-Nerve-Vasculature Crosstalk Modulates Muscle Regeneration following Critical Limb Ischemia

Mahir Mohiuddin¹, Austin Moon¹, Nan Hee Lee¹, Shannon Anderson¹, Woojin Han¹, and Young Jang¹

¹Georgia Institute of Technology, Atlanta, GA

TH-922

Preservation of Therapeutic Potential of Culture Expanded Human Mesenchymal Stem Cells by Maintaining Cellular Homeostasis

Xuegang Yuan¹, Yijun Liu¹, Ang-chen Tsai¹, and Teng Ma¹

¹Florida State University, Tallahassee, FL

TH-924

Mesenchymal Stem Cells Osteodifferentiation on Abaca-based Scaffolds

Roche de Guzman¹ and Hazel de Guzman²

¹Hofstra University, Hempstead, NY, ²New York University, Tuxedo, NY

TH-925

Differentiation of Mesenchymal Stem Cells into Smooth Muscle Cells Directed by Extracellular Matrix

Na Li^{1,2}, Hanna Sanyour^{1,2}, and Zhongkui Hong^{1,2}

¹University of South Dakota, Sioux Falls, SD, ²BioSNTR, Sioux Falls, SD

TH-926

Enhanced Differentiation of Human MSCs into Dopaminergic Neurons on PCL-Graphene Nanofiber Scaffold

Krishan Gopal Jain¹, Sonali Rawat¹, Deepika Gupta², Debika Debnath³,

Ankarao kalluri³, Neha Kaushik¹, Bhushan Dharmadhikari³

Ashwini Agrawal², Manjeet Jassal², Prabir Patra³, and Sujata Mohanty⁴

¹All India Institute of Medical Sciences, New Delhi, India,

²Indian Institute of Technology, New Delhi, India, ³University of Bridge-

port, Connecticut, CT, ⁴All India Institute of Medical Sciences,

New Delhi, India

TH-927

Development of Chitosan Nanoparticles for the Delivery of Pro-Elastogenic Biomolecules

Christofer Baldwin¹

¹University of Arkansas, Fayetteville, AR

TH-928

Hepatic Organoids Derived from Human Pluripotent Stem Cells

Ogechi Ogoke^{1,2}, Cortney Ott¹, Allison Kalinousky¹, Tala Mon¹, and Natesh Parashurama^{1,2}

¹State University of New York at Buffalo, Amherst, NY, ²Clinical and Translational Research Center, Buffalo, NY

Track: Biomedical Engineering Education (BME)

ABET Program Criteria, Student Outcomes

TH-929

Graduate Admissions in BME: Personal Contacts Outshine GPA and GRE Scores

Jose-Franck Diaz-Garelli¹, Vincent Wang^{2,3}, and Elaheh Rahbar^{1,3}

¹Wake Forest School of Medicine, Winston Salem, NC, ²Virginia Tech,

Blacksburg, VA, ³VT-WF School of Biomedical Engineering and

Sciences, Blacksburg, VA

TH-930

Sound Psyche: A Mobile Application to Promote Mental Health in the College Demographic

Ivan Liao¹, Amir Manbachi¹, and Nitish Thakor¹

¹Johns Hopkins, Baltimore, MD

Track: Biomedical Engineering Education (BME)

Classroom Technology Pedagogy and Innovation

TH-931

Design Thinking Process in Undergraduate Bioengineers

Ruth Ochia¹ and Yah-el Har-el¹

¹Temple University, Philadelphia, PA

TH-932

Student Choice of Learning Activities Improves Satisfaction Without Sacrificing Learning Outcomes

Brian Helmke¹

¹University of Virginia, Charlottesville, VA

TH-933

Early Implementation of Project-based, Self-learning Module at Sophomore Level to Develop CAD Skills in BME

Hannah Cebull¹, Rucha Joshi¹, Andrew Brightman¹,

Asem Aboelzahab¹, Joseph Muskat¹, Xiaoyu Xu¹, and Minku Kim¹

¹Purdue University, West Lafayette, IN

TH-934

Student Perceptions of a First Year Flipped Classroom Computer Aided Design Course

Angela Boronyak¹

¹University of Cincinnati, Cincinnati, OH

TH-935

The Muscle Car: Creation and Implementation of an Open-Source STEM Summer Camp

Samuel Bechara¹ and Dolly Ricapor¹
¹Colorado State University, Fort Collins, CO

TH-936

Offering One-, Two-, or Three-Semester Capstone Design

Elizabeth Bucholz¹, Chelsea Salinas¹, Kevin Caves¹, Bob Malkin¹, Ann Saterbak¹, and Mark Palmeri¹
¹Duke University, Durham, NC

TH-937

Popularity and Effectiveness of “Muddy Points” Addressed with Webcasts

Jean-Michel Maarek¹
¹University of Southern California, Los Angeles, CA

TH-938

Developing a Gold Nanoparticle Based Lab Experiment Sequence to Teach Biomedical Nanotechnology at the Undergraduate Level

Rachel Childers¹ and Stefan Wilhelm¹
¹University of Oklahoma, Norman, OK

TH-939

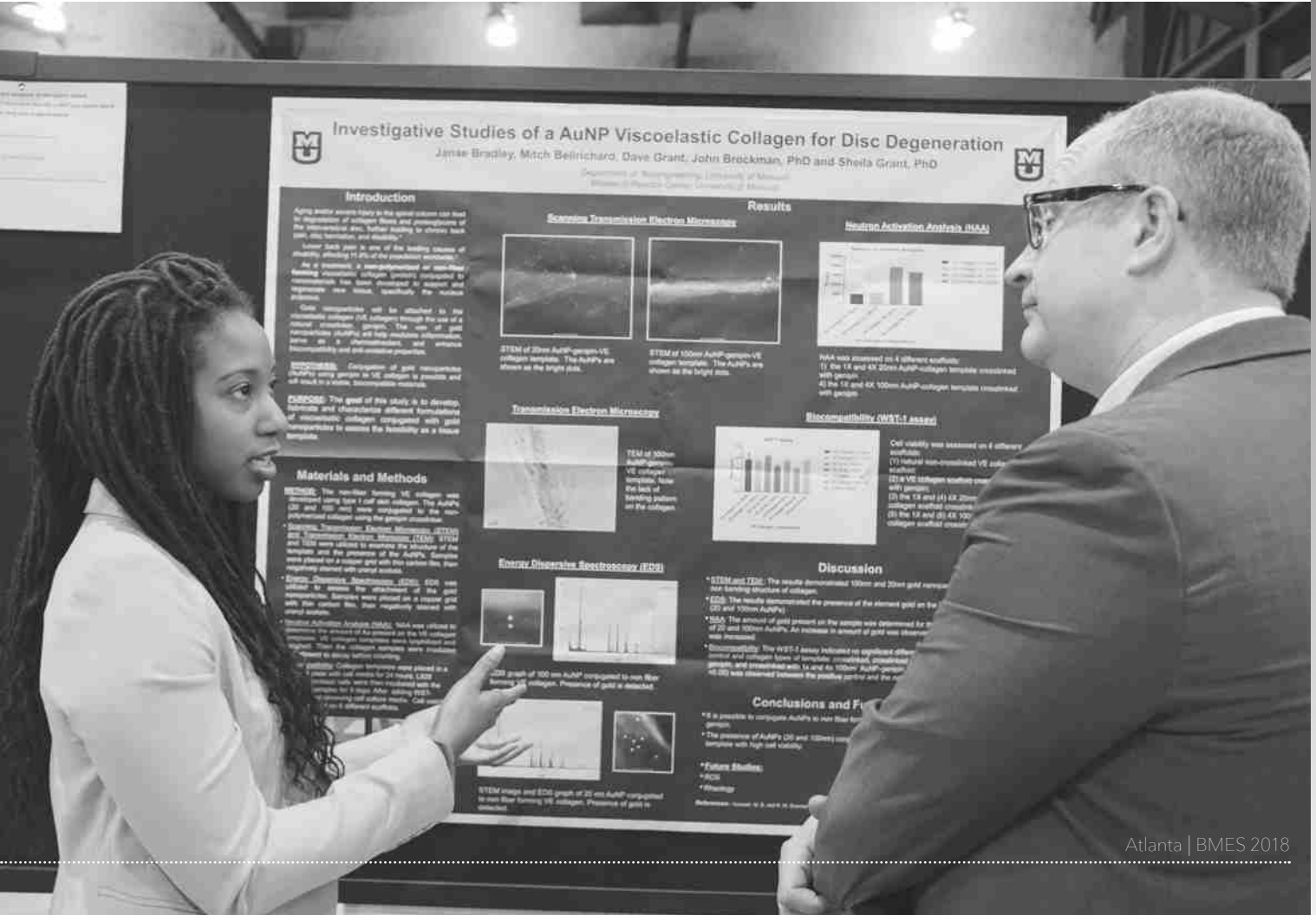
Using a Multimodal Approach of Instruction to Enforce Biological & Chemical System Fundamentals

Rohith Bhethanabotla¹, Tiffany Chen¹, Wooyang Son¹, Conan Chen¹, and Eileen Haase¹
¹Johns Hopkins University, Whiting School of Engineering, Baltimore, MD

TH-940

An Improved Form of One-on-one Experiential Wet Lab Teaching/Learning Supported by Electronized 3D Printed Lab Tools that Interact with Laboratory Video Games

Abdullah Mohamed Rizvi¹, Ryan Tam¹, Amna Haider¹, Bruce Coluccio¹, Timucin Altan¹, Chanpreet Singh¹, Richard McKenna¹, and M. Ete Chan¹
¹Stony Brook University, Stony Brook, NY



FRIDAY'S SCHEDULE HIGHLIGHTS

PLATFORM SESSIONS-FRI-1

8:00 am-9:30 am Convention Center
19 Concurrent Sessions See pages 93-101

SPECIAL SESSIONS

8:00 am-9:30 am A311
Advanced Biomanufacturing Session I:
Advanced Cell Manufacturing

8:00 am-9:30 am Room A411
AAA-BMES Symposium: Engineering and Imaging
the Stem Cell Niche for Guided Regeneration

8:00 am-9:30 am Room A301
Systems Thinking in the Education of
Biomedical Engineering Students

INDUSTRY SESSIONS

8:00 am-9:00 am Room A402
Product Development Implications
based on FDA Medical Device Classification

9:00 am-10:15 am Room A402
Connecting Engineering Skillsets with
Professional Achievement and Advancement

STUDENT & EARLY CAREER

8:00 am-10:30 am Room A310
BMES Student Chapter: Chapter Best Practices

9:00 am-10:00 am Room A412A
The Path to Graduate School

Exhibit Hall & Posters Open

9:30 am-5:00 pm Exhibit Hall

Poster Viewing with Authors

9:30 am-10:15 am Exhibit Hall
2:45 pm-3:30 pm

PLENARY SESSION

10:15 am-11:15 am Sidney Marcus Aud.
NIBIB Lecture | Design & Research
Awards | Journal Awards



Lihong Wang, PhD
California Institute of Technology

Women in BME Luncheon

11:30 am-1:00 pm Room A411



Jennifer West, PhD
Duke University
(ticket purchase required)

INDUSTRY SESSION

1:00 pm-2:30 pm Room A301
Clinical Innovators Spotlight

PLATFORM SESSIONS-FRI-2

1:15 pm-2:45 pm Convention Center
20 Concurrent Sessions See pages 102-110

SPECIAL SESSIONS

1:15 pm-2:45 pm A311
Advanced Biomanufacturing Session II:
Advanced Tissue Biofabrication

1:15 pm-2:45 pm A409
Engineering Solutions to Healthcare Disparities

1:30 pm-4:30 pm A301
BMES-NSF Session on CAREER and
UNSOLICITED Awards (preregistration required)

STUDENT & EARLY CAREER

1:30 pm-2:30 pm Room A412A
BME Entrepreneurial Careers

1:45 pm-3:15 pm Room A310
BMES Student Chapter: BMES Undergraduate
Student Design Competition

2:30 pm-4:00 pm Exhibit Hall A, Career Zone
Rapid Resume Review-Members Only

3:30 pm-5:00 pm Room A412A
Networking Effectively Online and in Person

INDUSTRY TOURS

2:00 pm-5:00 pm (Ticket Purchase Required)

PLATFORM SESSIONS-FRI-3

3:30 pm-5:00 pm Convention Center
19 Concurrent Sessions See pages 111-119

SPECIAL SESSIONS

3:30 pm-5:00 pm Room A310
BMES Graduate Medical Innovation Program
Workshop III: Defining Student Archetype(s)

3:30 pm-5:00 pm Room A409
Athanasίου Annals of Biomedical
Engineering Student Award Session

3:30 pm-5:00 pm Room A411
Physical Science Oncology Networking

PLENARY SESSION

5:15 pm-6:15 pm Sidney Marcus Aud.
Wallace H. Coulter Award
for Healthcare Innovation | Chapter Awards



Josh Makower, MD
New Enterprise Associates, Inc.

HOSTED RECEPTIONS

6:30 pm-8:30 pm Omni Hotel

BMES Dessert Party BASH & 50th Anniversary Celebration

8:30 pm-10:30 pm Murphy Ballroom
GWCC Building B

OP-Fri-1-1

Sidney Marcus
AuditoriumTrack: Biomaterials, Drug Delivery &
Intelligent Systems**Biomaterials for Drug Delivery I**

Chairs: Ester Kwon, Jungwoo Lee

8:00 am–8:15 am

**Macromolecular Engineering in Biomimetic
Silicone Hydrogel Contact Lenses for the
Controlled Release of Multiple Therapeutics**Stephen DiPasquale^{1,2,3}, Biaggio Uricoli^{1,2}, Matthew DiCerbo^{1,2}, and
Mark Byrne^{1,2,3}¹Rowan University, Glassboro, NJ, ²Biomimetic & Biohybrid Materials,
Biomedical Devices, & Drug Delivery Laboratories, Glassboro, NJ,
³OcuMedic, Inc., Glassboro, NJ

8:15 am–8:30 am

**Therapeutic ELP Nanoparticles for
Accelerated Wound Healing**Beyza Bulutoglu¹, Julie Devalliere¹, Basak E. Uygun¹, and
Martin L. Yarmush^{1,2}¹Harvard Medical School, Massachusetts General Hospital, Shriners
Hospitals for Children, Boston, MA, ²Rutgers University, Piscataway, NJ

8:30 am–8:45 am

**Bioresponsive Peptide-Polysaccharide Nanogels
that Augment the Utility of Bioactive Cargo**Andrew Simonson¹, Atip Lawanprasert¹, Tyler Goralski¹,
Kenneth Keiler¹, and Scott Medina¹¹The Pennsylvania State University, University Park, PA

8:45 am–9:00 am

**Ultra-sensitive ROS-responsive Tellurium-
Containing Polymers**Huaping Xu¹¹Tsinghua University, Beijing, China, People's Republic of

9:00 am–9:15 am

**Marrow Targeted Nanoparticle Delivery of
Maraviroc to Treat Acute Myeloid Leukemia (aML)**Marian Ackun-Farmmer¹, Daniel Byun¹, Benjamin Frisch¹, and
Danielle S.W. Benoit¹¹University of Rochester, Rochester, NY

9:15 am–9:30 am

**Titanium Functionalized with Poly(acrylic acid)
Brushes for Substrate Mediated Gene Delivery**Amy Mantz^{1,2}, Alice Rosenthal^{3,4}, Eva Bittrich³, Eva Franke-Schubert^{1,2},
Mathias Schubert^{1,2}, Manfred Stamm^{3,4}, Petra Uhlmann^{1,3}, and
Angela Pannier^{1,2}¹University of Nebraska-Lincoln, Lincoln, NE, ²Center for Nanohybrid
Functional Materials, Lincoln, NE, ³Leibniz Institute of Polymer
Research Dresden, Dresden, Germany, ⁴Technische Universitat
Dresden, Dresden, Germany

OP-Fri-1-2

Room A312

Track: Biomaterials

Natural Biomaterials

Chairs: Jeffrey Wolchok, Jangwook Jung

8:00 am–8:15 am

**Glycation Decreases Intrafibrillar Collagen
Mineralization with Effects on Breast Cancer Cells**Siyoung Choi¹, Netta Vidavsky¹, Lara Estroff¹, and Claudia Fischbach¹
¹Cornell University, Ithaca, NY

8:15 am–8:30 am

**Modulating Mechanical Properties of
Collagen-Lignin Composites: Animal and
Plant Extracellular Matrices**Jorge A. Belgodere¹, Syed A. Zamin¹, Katie M. Hamel¹, Jai S. Rudra²,
Bert C. Lynn³, and Jangwook P. Jung¹¹Department of Biological Engineering, Louisiana State University,
Baton Rouge, LA, ²Department of Pharmacology and Toxicology,
Searly Center for Vaccine Development, University of Texas Medical
Branch, Galveston, TX, ³Department of Chemistry, University of
Kentucky, Lexington, KY

8:30 am–8:45 am

**3D Matrices Mimicking the Diabetic Disease
State Induce an Angiogenic Secretome**Adam Munoz¹ and Cynthia Reinhart-King^{1,2}¹Vanderbilt University, Nashville, TN, ²Cornell University, Ithaca, NY

8:45 am–9:00 am

**Uncovering Functional Differences among
High-Density Lipoprotein Mimetic Nanoparticles
For Diagnostic And Therapeutic Applications**Yoshitaka Sei¹, Jungho Ahn^{1,2}, Taeyoung Kim¹, Eunjung Shin¹, Angel
Santiago-Lopez¹, Seung Soon Jang¹, Noo Li Jeon², Young Jang¹, and
YongTae Kim¹¹Georgia Institute of Technology, Atlanta, GA,²Seoul National University, Seoul, Korea, Republic of

9:00 am–9:15 am

**Decoupling Cellular Response to Topography
and Stiffness in Three Dimensions**Colin Paul¹, Alex Hruska¹, Jack Staunton¹, Hannah Burr¹, Jiyun Kim²,
Nancy Jiang¹, and Kandice Tanner¹¹National Cancer Institute, Bethesda, MD, ²UNIST, Ulsan,
Korea, Republic of

OP-Fri-1-3

Room A410

Track: Cancer Technologies, Biomedical Imaging and Instrumentation

Imaging Strategies and Molecular Profiling

Chairs: Huang Chiao Huang, Hong Liu

8:00 am–8:15 am

Strategies To Prevent Cervical Cancer In The First Mile Of The Cancer Care Continuum

Jenna L Mueller¹ and Nimmi Ramanujam¹
¹Duke University, Durham, NC

8:15 am–8:30 am

MRI Evaluation Of The Effect Of Whole Brain Radiotherapy On Breast Cancer Brain Metastasis

William Crowe¹, Lulu Wang¹, Zhongwei Zhang¹, John Bourland¹, Jasmina Varagic¹, and Dawen Zhao¹
¹Wake Forest School of Medicine, Winston Salem, NC

8:30 am–8:45 am

Biodegradable Cross-Linked Nanocapsules Developed from Zwitterionic Polymer for Tumor Imaging

Haotian Sun¹, Lingyue Yan¹, Yun Wu¹, and Chong Cheng¹
¹University at Buffalo, The State University of New York, Buffalo, NY

8:45 am–9:00 am

Transforming FLIM into a High-Content Molecular Analysis Platform

Maha Rahim¹, Enrico Gratton¹, and Jered Haun¹
¹University of California Irvine, Irvine, CA

9:00 am–9:15 am

Real-Time Molecular Mapping Of Tumor Heterogeneity Using Precision-Targeted Nanophotonic Probes

Harini Kantamneni¹, Michael Donzanti¹, Sandra Pelka¹, Shravani Barkund¹, Xinyu Zhao², Shuqing He², Mark Pierce¹, Mei Chee Tan², Richard E. Riman¹, Charles Roth¹, Vidya Ganapathy¹, and Prabhast Moghe¹
¹Rutgers University, Piscataway, NJ, ²Singapore University of Technology and Design, Singapore, Singapore

9:15 am–9:30 am

NCI Funding Opportunities to Address Unmet Technology Needs for Advancing Cancer Research

Tony Dickherber¹
¹National Cancer Institute, Bethesda, MD

OP-Fri-1-4

Room A313

Track: Biomechanics

Biomechanics of Rehabilitation

Chairs: Robin Queen, Thurmon Lockhart

8:00 am–8:15 am

Landing Differences between Surgical and Non-Surgical Limbs with Brace Wear after ACL Reconstruction

Cherice Hughes-Oliver¹ and Robin Queen^{1,2}
¹Virginia Tech, Blacksburg, VA, ²Virginia Tech Carilion School of Medicine, Roanoke, VA

8:15 am–8:30 am

3D Walking Kinetics in Response to Surgically-Reduced Adipose in a Transfemoral Amputee Residuum

Emily Levy¹, Nicholas Fey¹, and Keith Gordon²
¹The University of Texas at Dallas, Richardson, TX, ²Northwestern University, Chicago, IL

8:30 am–8:45 am

Differences in Trunk Muscle Forces and Spinal Loads During Sit-To-Stand and Stand-To-Sit Activities Between Persons With and Without Transfemoral Amputation

Matthew Ballard¹, Iman Shojaei¹, Brad Hendershot^{2,3,4}, Julian Acasio³, Christopher Dearth^{2,3,4}, and Babak Bazrgari¹
¹University of Kentucky, Lexington, KY, ²DoD-VA Extremity Trauma and Amputation Center of Excellence, Bethesda, MD, ³Research and Development Section, Department of Rehabilitation, Walter Reed National Military Medical Center, Bethesda, MD, ⁴Department of Rehabilitation Medicine, Uniformed Services University of the Health Sciences, Bethesda, MD

8:45 am–9:00 am

The Possible Role of Corticospinal Pathway Demand in Slip Recovery Responses

Sam Wilson^{1,2}, John Garner³, Tyler Donahue², Caleb Williams², Christopher Hill², and Dwight Waddell²
¹Georgia Southern University, Statesboro, GA, ²University of Mississippi, Oxford, MS, ³Troy University, Troy, AL

9:00 am–9:15 am

Using the Loadsol to Predict Knee Extension Moment Asymmetry During a Stop Jump

Alexander Peebles¹ and Robin Queen¹
¹Virginia Tech, Blacksburg, VA

9:15 am–9:30 am

Tissue Strain Based Scaling of Spinal Cord Injury in Animal Models: From Rat to Cat

Annalisa De Paolis¹, Preston Williams², Dennis Truong¹, Marom Bikson¹, John Martin², and Luis Cardoso¹
¹City College of New York, New York, NY, ²City University of New York, New York, NY

OP-Fri-1-5

Room A314

Track: Biomechanics, Tissue Engineering

Biomechanics in Cell and Tissue Engineering

Chair: Tim Downing

8:00 am–8:15 am

Microengineered Muscle Satellite Cell Niche on Chip for Parabiosis Aging Studies

Yunki Lee¹, Song Ih Ahn¹, Jeongmoon Choi¹, Jiwon Yom¹, Eun Jung Shin¹, Young C. Jang¹, and YongTae Kim¹
¹Georgia Institute of Technology, Atlanta, GA

8:15 am–8:30 am

Time-Scale and Other Dependencies in 3D Cell Culture Mechanics

Matthew Walker¹, Michel Godin¹, and Andrew Pelling¹
¹University of Ottawa, Ottawa, ON, Canada

8:30 am–8:45 am

Mechanical Stress Patterns in Spheroids Arise from Outside-in Compaction During Tissue Formation

Wontae Lee¹, Elena Kuzmin¹, Stephanie Mok¹, Ruba Halaoui¹, Luke McCaffrey¹, Morag Park¹, Ruogang Zhao², Richard Leask¹, and Christopher Moraes¹

¹McGill University, Montreal, QC, Canada,

²State University of New York, Buffalo, NY

8:45 am–9:00 am

Understanding the Three-dimensional Packing of Curved Epithelia

Javier Buceta¹, Pedro Gómez-Gálvez², Pablo Vicente-Munuera², and Luis M. Escudero²

¹Lehigh University, Bethlehem, PA, ²Departamento de Biología Celular, Universidad de Sevilla and Instituto de Biomedicina de Sevilla (IBiS), Hospital Universitario Virgen del Rocío/CSIC/Universidad de Sevilla, Seville, Spain

9:00 am–9:15 am

The Potential Adverse and Enhancement Effect of Evanescent Ultrasound on Embryonic Development.

Yoshinobu Murayama¹

¹Nihon University, Fukushima, Japan

9:15 am–9:30 am

Can We Detect Intrauterine Growth Restriction Via Placenta Biomechanics? <u></u>

Shier Nee Saw¹, Jess Yi Ru Low¹, May Han Huang Ong¹, Yu Wei Poh¹, Citra Nurfarah Zaini Mattar², Arijit Biswas², and Choon Hwai Yap¹

¹National University Of Singapore, Singapore, Singapore, ²National University Health System, Singapore, Singapore, Singapore

OP-Fr-1-6

Room A315

Track: Biomechanics, Cellular and Molecular Bioengineering

Matrix Effects in Mechanobiology II

Chairs: Daniel Conway, Ian Wong

8:00 am–8:15 am

3D Collagen Architecture Regulates Cell-ECM Coupling, Metabolic Stress, and Collective Morphogenesis

Stephanie Fraley¹, Daniel Ortiz Velez¹, Sural Ranamukhaarachchi¹, Anthony Han¹, Adam Engler¹, and Aditya Kumar¹

¹UC San Diego, La Jolla, CA

8:15 am–8:30 am

Increased Aortic Stiffness Following Spinal Cord Injury: Potential Opposing Effects of TNFR1 and TNFR2

Swathi Swaminathan¹, Valerie Bracchi-Riccard¹, John Bethea¹, and Alisa Clyne¹

¹Drexel University, Philadelphia, PA

8:30 am–8:45 am

Substrate Mechanics Regulate Placental Syncytiotrophoblast Formation

Zhenwei Ma¹ and Christopher Moraes¹

¹McGill University, Montreal, QC, Canada

8:45 am–9:00 am

ECM Composition May Propagate Pulmonary Hypertension Beyond Mechanical Strain

Patrick Link¹, Franck Kamga Gninzeko², Laszlo Farkas², and Rebecca Heise²

¹Virginia Commonwealth University, Bon Air, VA,

²Virginia Commonwealth University, Richmond, VA

9:00 am–9:15 am

Lower Matrix-Bound Water Concentration in Mice with Brittle Bones Caused by Osteogenesis Imperfecta and Separately ATF4 Deficiency.

Sasidhar Uppuganti¹, Mathilde Granke², Amy Creecy³, Julie Schnur³, Ben Greene⁴, Mark Does³, and Jeffrey Nyman^{1,3,5}

¹Vanderbilt University Medical Center, Nashville, TN, ²Axial Healthcare Inc., Nashville, TN, ³Vanderbilt University, Nashville, TN,

⁴Sanofi-Genzyme, Farmingham, MA, ⁵VA Tennessee Valley Healthcare System, Nashville, TN

9:15 am–9:30 am

The Role of Age in Shear-Induced Platelet Activation: Effect of Calcium on Cord and Adult Platelets

Jawaad Sheriff¹, Amanda Zigomalas¹, Lisa Malone²,

Brianne Polehinke¹, Wadie Bahou², and Danny Bluestein¹

¹Department of Biomedical Engineering, Stony Brook University, Stony Brook, NY, ²Department of Medicine, Division of Hematology, Stony Brook University, Stony Brook, NY

OP-Fr-1-7

Room A316

Track: Biomedical Imaging and Instrumentation, Cardiovascular Engineering

Optics and Spectroscopy in Blood and Cardiovascular Applications

Chairs: Zhen Qiu, Tim Muldoon

8:00 am–8:15 am

Using Machine Learning to Optimize How Microscopes Detect Infectious Disease

Roarke Horstmeyer¹

¹Duke University, Durham, NC

INVITED

8:15 am–8:30 am

Noninvasive Bedside Monitoring of Microvascular Cerebral Blood Flow in Children with Sickle Cell Disease

Seung Yup Lee¹, Bharat Sanders¹, Kyle Cowdrick¹, Wilbur Lam^{1,2}, and Erin Buckley^{1,2}

¹Georgia Institute of Technology/Emory University, Atlanta, GA,

²Emory University School of Medicine, Atlanta, GA

8:30 am–8:45 am

Quantitative 3D Morphology of 9L Tumor Vasculature Using Optical Tissue Clearing Methods

Vaibhav Janve¹, Adam Anderson¹, and John Gore¹
¹Vanderbilt University, Nashville, TN

8:45 am–9:00 am

Boost of Cerebral Tissue Metabolism and Oxygenation by Transcranial 1064-nm Laser

Xinlong Wang¹, Divya Reddy¹, Sahil Nalawade¹, Francisco Gonzalez-Lima², and Hanli Liu¹
¹University of Texas at Arlington, Arlington, TX,
²University of Texas at Austin, Austin, TX

9:00 am–9:15 am

Feasibility of Visible Diffuse Reflectance Spectroscopy for Liver Oximetry in an *In Vivo* Swine Model

Faraneh Fathi¹, Stylianos Voulgarelis², Astrid G. Stucke², and Bing Yu¹
¹Marquette University, Milwaukee, WI, ²Medical College of Wisconsin, Milwaukee, WI

9:15 am–9:30 am

Optogenetic Pacing in *Drosophila* Using Red-light

Jing Men¹, Jason Jerwick¹, Rudolph Tanzi², Airong Li², and Chao Zhou¹
¹Lehigh University, Bethlehem, PA, ²Massachusetts General Hospital, Boston, MA

OP-Fri-1-8

Room A302

Track: Tissue Engineering, Cellular and Molecular Bioengineering

Engineering Multi-cellular Systems

Chairs: Megan McCain, YongTae Kim

8:00 am–8:15 am

Assembly of Human Stem Cell-Derived Vascular Spheroids and Cortical Spheroids to Model 3-D Brain-like Tissues

Liqing Song¹, Xuegang Yuan¹, Kyle Griffin¹, Teng Ma¹, and Yan Li¹
¹Florida state university, Tallahassee, FL

8:15 am–8:30 am

Reconstitution of *In Vitro* Tissue Models Via 3D Multicellular Spheroids in the Engineered Concave Microwells

GeonHui Lee¹ and Dong-Hwee Kim¹
¹Korea University, Seoul, Korea, Republic of

8:30 am–8:45 am

‘Suicide Switch’ to Improve Models of Human Tissue Engineered Microlivers

Amanda Chen¹, Lilianna Mancio-Silva¹, Arnav Chhabra¹, Hyun-Ho Greco Song^{1,2}, Heather Fleming¹, Christopher Chen², and Sangeeta Bhatia¹
¹Massachusetts Institute of Technology, Cambridge, MA,
²Boston University, Boston, MA

8:45 am–9:00 am

***In Vitro* 3D Human Innervated Tissue Model of the Intestine to Study Substance P**

Eleana Manousiouthakis¹, Ying Chen¹, Dana Cairns¹, Michael Dente¹, Rachel Pollard¹, Kaia Gerlovin¹, and David Kaplan¹
¹Tufts University, Medford, MA

9:00 am–9:15 am

Fabrication of Phenotypically Stable Human Liver Co-Cultures Using 4 Primary Cell Types

Chase Monckton¹ and Salman Khetani¹
¹University of Illinois at Chicago, Chicago, IL

9:15 am–9:30 am

***In Vitro* Engineering of Muscle Tissue Injury In Human Cancer Cachexia**

Mark Mondrinos¹, Yoon-Suk Yi¹, Matthew Osborn¹, and Donggeun Huh¹
¹University of Pennsylvania, Philadelphia, PA

OP-Fri-1-9

Room A305

Track: Device Technologies and Biomedical Robotics, Orthopedic and Rehabilitation Engineering

Prosthetics and Exoskeletons

Chair: Zhen Qui

8:00 am–8:15 am

An Ultrasound-based Approach for Human Lower-limb Motion Prediction and its Application in Assistive Device Control

Mohammad Hassan Jahanandish¹, Nicholas Fey^{1,2}, and Kenneth Hoyt^{1,2}
¹University of Texas at Dallas, Richardson, TX,
²University of Texas Southwestern Medical Center, Dallas, TX

8:15 am–8:30 am

Designing a Wearable Shoulder Exoskeleton to Assist Flexion and Abduction in Hemiparetic Patients

Tess Meier¹, Veronica Rivera¹, Emily DiRuzza¹, Alyssa Marzella¹, Christopher J. Nycz¹, Tiffany A. Butler¹, and Gregory S. Fischer¹
¹Worcester Polytechnic Institute, Worcester, MA

8:30 am–8:45 am

Effect of Exoskeleton Joint Friction Compensation on Metabolic Consumption During Walking

Ryan-David Reyes¹, Mark Nandor¹, Connor Mulcahy¹, Rudolf Kobetic², and Ronald Triolo¹
¹Case Western Reserve University, Cleveland, OH,
²Louis Stokes Cleveland VA Medical Center, Cleveland, OH

8:45 am–9:00 am

Using Muscle Synergies for Dimensionality Reduction in Dynamic Hand Function for Neuroprosthetic Control

Natalie Cole^{1,2} and A. Bolu Ajiboye^{1,2}
¹Case Western Reserve University, Cleveland, OH, ²Louis Stokes Cleveland Department of Veterans Affairs Medical Center, Cleveland, OH

9:00 am–9:15 am

Design of a Single Actuator Differential Mechanism for a Prosthetic Hand

Fadi Gerges¹ and Jaydip Desai¹
¹Wichita State University, Wichita, KS

9:15 am–9:30 am

Development of a Wheelchair-Mounted Robotic Exoskeleton to Assist Person with Upper Limb Movement Disability

Bridget Schabron¹ and Jaydip Desai¹
¹Wichita State University, Wichita, KS

OP-Fri-1-10

Room A401

Track: Cardiovascular Engineering

Cardiovascular Models and Remodeling

Chairs: Renee Cottle, Jianjun Guan

8:00 am–8:15 am

Cadherin-11 is a Therapeutic Target for Chronic Inflammation-induced Heart FailureCynthia Clark¹, Christine Scott¹, Qinkun Zhang¹, Hind Lal¹, and W. David Merryman¹¹Vanderbilt University, Nashville, TN

8:15 am–8:30 am

Vasculopathy Due to Cathepsin-Induced Elastic Lamina Fragmentation in Sickle Cell DiseaseHananh Song¹, Jada Selma¹, Edward Botchwey¹, and Manu Platt¹¹Georgia Institute of Technology, Atlanta, GA

8:30 am–8:45 am

Glucose-Mediated Smooth Muscle Cell Contraction is Required for Calcification *In Vitro*Amirala Bakhshiannik¹, Daniela Medina¹, and Joshua Hutcheson¹¹Florida International University, Miami, FL

8:45 am–9:00 am

A Tissue-Engineered Scale Model of the Heart VentricleLuke MacQueen¹, Sean Sheehy¹, Christophe Chantre¹, John Zimmermann¹, Francesco Pasqualini¹, Xujie Liu², Josué Goss¹, Patrick Campbell¹, Grant Gonzalez², Sun Jin Park¹, Andrew Capulli¹, John Ferrier¹, T. Fattah Kosar³, Lakshminarayanan Mahadevan¹, William Pu², and Kevin Kit Parker¹¹Harvard University, Cambridge, MA, ²Boston Children's Hospital, Boston, MA, ³Wyss Institute for Biologically-Inspired Engineering, Boston, MA

9:00 am–9:15 am

Tissue Engineered Atherosclerosis Model in a Physiological BioreactorJun Chen¹, Xixi Zhang¹, Grant Alexander¹, Patrick Hwang¹, ChaeYun Bae¹, Chunxiang Zhang¹, Young-Sup Yoon², Brigitta Brott¹, Palaniappan Sethu¹, Jeonga Kim¹, and Ho-Wook Jun¹¹University of Alabama at Birmingham, Birmingham, AL, ²Emory University, Atlanta, GA

9:15 am–9:30 am

Anisotropic Hybrid Silk-Cardiac Extracellular Matrix Scaffolds for an *In Vitro* Human Myocardial Tissue Model of Pathologic RemodelingBreanna M Duffy¹, Whitney L Stoppel¹, and Lauren D Black, III¹¹Tufts University, Medford, MA

OP-Fri-1-11

Room A403

Track: Cardiovascular Engineering

Heart Valve Structure and Replacement

Chair: Kristyn Masters

8:00 am–8:15 am

Feasibility of a Novel Polymeric Aortic Valve for Transcatheter Applications: Thrombogenicity, Hemodynamics, and Valve StabilityOren Rotman¹, Brandon Kovarovic¹, Matteo Bianchi¹, Ram Ghosh¹, Wei-Che Chiu¹, Marvin Slepian², and Danny Bluestein¹¹Stony Brook University, Stony Brook, NY,²University of Arizona Tucson, AZ

8:15 am–8:30 am

A Novel Transcatheter Polymeric Heart ValveMegan Heitkemper¹, Hoda Hatoum¹, Rachel Simon-Walker², Hieu Bui², Ketul Popat², Susan James², John Kelly³, John Cheatham³, Darren Berman³, Christopher Breuer³, and Lakshmi Dasi¹¹The Ohio State University, Columbus, OH, ²Colorado State University, Fort Collins, CO, ³Nationwide Children's Hospital, Columbus, OH

8:30 am–8:45 am

On the Relevance of Aortic Valve's Branching Fibrous Architecture On Valve Mechanics and Stress DistributionDorma Flemister¹ and Lakshmi Dasi¹¹The Ohio State University, Columbus, OH

8:45 am–9:00 am

A Hemodynamic Comparison of Bioprosthetic Rapid Deployment Aortic Valve Versus Contemporary Surgical ValveVahid Sadri¹, Charles Bloodworth¹, Immanuel David Madukauwa-David¹, Prem A. Midha¹, Vrishank Raghav², and Ajit P. Yoganathan¹¹Georgia Institute of Technology, Atlanta, GA, ²Auburn University, Auburn, AL

9:00 am–9:15 am

Notch1 Mutation Causes a Hyper-Secretory Phenotype in Aortic Valve Interstitial CellsEthan Joll¹ and W. David Merryman¹¹Vanderbilt University, Nashville, TN

9:15 am–9:30 am

Serum From Transcatheter Aortic Valve Replacement Patients Mediates Valvular Myofibroblast ActivationBrian Aguado¹, Joseph Grim¹, Cierra Walker¹, Aik-Choon Tan², Anne Cox¹, Timothy McKinsey², Kristi Anseth¹, and Katherine Schuetz²¹University of Colorado Boulder, Boulder, CO, ²University of Colorado Anschutz Medical School, Aurora, CO

OP-Fri-1-12

Room A404

Track: Cellular and Molecular Bioengineering

Young Innovators of Cellular and Molecular Bioengineering: Part I

Chairs: Mike King, Cynthia Reinhart-King, William Bentley

8:00 am–8:15 am

The Mechanosensitive Ion Channel TRPV4 is a Regulator of Lung Development and Pulmonary Vasculature StabilizationJason Gleghorn¹¹University of Delaware, Newark, DE

8:15 am–8:30 am

Pre-Conditioning Stem Cells in a Biomimetic Environment for Enhanced Cardiac Tissue Repair: *In Vitro* and *In Vivo* AnalysisArghya Paul¹¹University of Kansas, Lawrence, KS

8:30 am–8:45 am

Microenvironmental Modulation of Calcium Wave Propagation Velocity in Engineered Cardiac TissuesMegan McCain¹¹University of Southern California, Los Angeles, CA

8:45 am–9:00 am

Competitive Tuning among Ca²⁺/Calmodulin-Dependent Proteins: Analysis of *In Silico* Model Robustness and Parameter Variability

Tamara Kinzer-Ursem¹
¹Purdue University, West Lafayette, IN

9:00 am–9:15 am

Engineered Stochastic Adhesion Between Microbes as a Protection Mechanism Against Environmental Stress

Cheemeng Tan¹
¹University of California Davis, Davis, CA

OP-Fri-1-13

Room A405

Track: Nano and Micro Technologies

Nanotechnologies for Medical Applications

Chairs: Danielle Benoit, Zhen Gu

8:00 am–8:15 am

Cadmium-Free Quantum Dots for Multiplexed Tissue-Depth Imaging

Alexander Saeboe¹, Joshua Kays¹, Reyhaneh Toufanian¹, Margaret Chern¹, and Allison Dennis¹
¹Boston University, Boston, MA

8:15 am–8:30 am

Multimodality Theranostic Copper Sulfide Nanoparticles

Ali Gawi¹, Sundaresan Gobalakrishnan¹, Huseyin Cicek¹, Nouri Elmekham¹, Philip McDonagh¹, Li Wang¹, and Jamal Zweit¹
¹Virginia Commonwealth University (VCU), Richmond, VA

8:30 am–8:45 am

***In Vitro* Assessment of Heparin-Coated Magnetic Nanoparticles**

Nardine Ghobrial¹, Benjamin Fellows¹, O. Thompson Mefford¹, and Delphine Dean¹
¹Clemson University, Clemson, SC

8:45 am–9:00 am

Tuning Nanoscale Vehicles for Localization to Cartilage Through Active and Passive Targeting Strategies

Shannon Brown¹, Lei Wang¹, and Blanka Sharma¹
¹University of Florida, Gainesville, FL

9:00 am–9:15 am

Effect of Nanofibers on the Time Dependent Bone Growth Around a Titanium Implant

Sadegh Nikfarjam¹, Amal Swediwah², Subhakar Tummala², Wendy Williams³, Jacquelyn Herron³, Marybeth Humphrey³, and Morshed Khandaker¹
¹Engineering and Physics, Edmond, OK, ²University of Central Oklahoma, Edmond, OK, ³University of Oklahoma-Health Science Center, Oklahoma City, OK

9:15 am–9:30 am

Flexible Patchable Electro-Transfection Nano-Device for Direct on-Skin Gene Therapy

Lingqian Chang¹, Chandani Chitrakar¹, Donghui Zhu¹, Yongcun Hao², and Honglong Chang²
¹University of North Texas, Denton, TX, ²Northwestern Polytechnical University, Xian, China, People's Republic of

OP-Fri-1-14

Room A406

Track: Nano and Micro Technologies

Molecular Sensors and Nanodevices for Diagnostics

Chairs: Amber Doiron, Stuart Cogan

8:00 am–8:15 am

Detecting DNA Cytosine Methylation with LiCl Salt Gradient in the Wild-Type Alpha-Hemolysin Nanopore

Trang Vu¹, Julia Borges¹, Joanna Soyring¹, Melissa D'Alia¹, Shanna Davidson², and Jiwook Shim¹
¹Rowan University, Glassboro, NJ, ²University of Pittsburgh, Pittsburgh, PA

8:15 am–8:30 am

Measuring Protein Secretion From Single Cells at Single Molecule Resolution Using Quantum Dots

Vanessa Herrera¹, Ssu-Chieh Joseph Hsu¹, Maha K. Rahim¹, Wendy Liu¹, and Jered B. Haun¹
¹UC Irvine, Irvine, CA

8:30 am–8:45 am

Highly Sensitive and Rapid Cytokine Optoelectronic Immunosensing by Bio-Tunable Nanoplasmonic Filter on Few-Layer MoS₂

Young Geun Park¹, ByungHoon Ryu¹, Xiaogan Liang¹, and Katsuo Kurabayashi¹
¹University of Michigan, Ann Arbor, MI

8:45 am–9:00 am

Microfluidic DNA-Based Potassium Sensor Platform for Improved Dialysis Treatment

Alexander Smith¹, Bin Zhao¹, Mingxu You¹, and Juan Jiménez¹
¹University of Massachusetts, Amherst, MA

9:00 am–9:15 am

Protease Activity Sensors Noninvasively Classify Bacterial Infections and Antibiotic Response

Colin Buss^{1,2}, Jaideep Dudani^{1,2}, Reid Akana¹, and Sangeeta Bhatia^{1,3,4,5}
¹Massachusetts Institute of Technology, Cambridge, MA, ²Koch Institute for Integrative Cancer Research at MIT, Cambridge, MA, ³Broad Institute of MIT and Harvard, Cambridge, MA, ⁴Brigham & Women's Hospital, Boston, MA, ⁵Howard Hughes Medical Institute, Cambridge, MA

9:15 am–9:30 am

Energy Transfer-Based Biosensors for Label-Free Detection using Transcription Factor-DNA Binding

Thuy Nguyen¹, R. Cooper Baer¹, Margaret Chern¹, James Gallagan¹, and Allison Dennis¹
¹Boston University, Boston, MA

OP-Fri-1-15

Room A407

Track: Bioinformatics, Computational and Systems Biology

Omics Data: Methods, Modeling, and Analysis

Chairs: Karin Jensen, Sriram Chandrasekaran

8:00 am–8:15 am

Dissecting the Dynamics of N-linked Glycosylation through Time Course Omics AnalysesSepideh Dolatshahi¹, Ron Weiss¹, and Douglas Lauffenburger¹
¹Massachusetts Institute of Technology, Cambridge, MA

8:15 am–8:30 am

Integrative Analysis of Glycosylation Networks Using Transcriptomics and Glycomics Data SetsYusen Zhou¹, Theodore Groth¹, and Sriram Neelamegham¹
¹SUNY at Buffalo, Buffalo, NY

8:30 am–8:45 am

Substrate-Based Kinase Activity Inference: Interpreting Phosphoproteomic Data Using Computational Enrichment AnalysisSamantha Dale Strasser^{1,2}, Alina Starchenko^{1,2}, Jesse Lyons^{1,2}, Phaedra C. Ghazi², Myriam Boukhalil^{3,4}, Amanda Edwards^{3,4}, Douglas K. Brubaker^{1,2}, Brian A. Joughin¹, Wilhelm Haas^{3,4}, Douglas A. Lauffenburger¹, and Kevin M. Haigis^{2,4}
¹Massachusetts Institute of Technology, Cambridge, MA, ²Beth Israel Deaconess Medical Center, Boston, MA, ³Massachusetts General Hospital, Boston, MA, ⁴Harvard Medical School, Boston, MA

8:45 am–9:00 am

Multivariate Signature of Coagulopathy Correlates with Poor Thermoregulation and Organ Damage in Heat Stroke PathologyElizabeth Proctor¹, Shauna Dineen², Gerald Audet², Michelle King², Matthew Ward², W. Bruce Adams², Lisa Leon², and Douglas Lauffenburger³
¹Pennsylvania State University, Hershey, PA, ²US Army Research Institute of Environmental Medicine, Natick, MA, ³Massachusetts Institute of Technology, Cambridge, MA

9:00 am–9:15 am

ASPEN: Analyzing and Reconstructing Paralog Divergence Using Ortholog SubsamplingRoman Sloutsky¹ and Kristen Naegle¹
¹Washington University in St. Louis, St. Louis, MO

9:15 am–9:30 am

Metabolic Network Analysis of *Pseudomonas Aeruginosa* Persister CellsAnna Blazier¹, Glynis Kolling¹, Alejandro Amezcua², Aline Metris², and Jason Papin¹
¹University of Virginia, Charlottesville, VA, ²Unilever, Sharnbrook, United Kingdom

OP-Fri-1-16

Room A303

Track:

Neuromodulation

Chairs: Kevin Otto, Anja Kunze

8:00 am–8:15 am

Acoustically Targeted Chemogenetics for a Noninvasive Spatially, Temporally, and Cell-Specific Control of Neural Circuits.Jerzy Szabłowski¹, Audrey Lee-Gosselin¹, Brian Lue¹, Dina Malounda¹, and Mikhail Shapiro¹
¹Caltech, Pasadena, CA

8:15 am–8:30 am

Chronic Pancreatic Neuromodulation for the Control Of Blood GlucoseElliott Dirr¹, Francisco Delgado¹, Yogi Patel², and Kevin Otto¹
¹University of Florida, Gainesville, FL, ²Johns Hopkins University, Baltimore, MD

8:30 am–8:45 am

Window Into the Colon: Visualizing Neuromodulation of the Colon Nerve Network *In Vivo*Nikolai Rakhilin^{1,2}, Aliesha Garrett², Katherine Chavez², and Xiling Shen²
¹Cornell University, Durham, NC, ²Duke University, Durham, NC

8:45 am–9:00 am

Cortico-thalamic Closed-loop Deep Brain Stimulation: an Enhanced Treatment of Essential TremorEnrico Oprei¹, Stephanie Cernera¹, Michael Okun¹, Kelly Foote¹, and Aysegul Gunduz¹
¹University of Florida, Gainesville, FL

9:00 am–9:15 am

ON vs. OFF Sustained Alpha Retinal Ganglion Cells in the Mouse have Different Axon Initial SegmentsVineeth Raghuram^{1,2,3}, Paul Werginz^{3,4}, Brian Timko¹, and Shelley Fried^{2,3}
¹Tufts University, Medford, MA, ²Boston VA Healthcare System, Boston, MA, ³Massachusetts General Hospital—Harvard Medical School, Boston, MA, ⁴Vienna University of Technology, Vienna, Austria

9:15 am–9:30 am

Vagus Nerve Stimulation Improves Learning in an Object Recognition Memory TaskTeresa Sanders¹
¹Vanderbilt University, Nashville, TN

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Room A304

Track: Orthopedic and Rehabilitation Engineering

Cartilage and Osteoarthritis

Chairs: Yunzhi Peter Yang, Jason Shearn

8:00 am–8:15 am

Quantifying Magnetic Particle Distribution in Healthy and OA Rat Knee Joints Using IVIS and EPR

Brittany Partain¹, Mythreyi Unni¹, Jon Dobson¹, Carlos Rinaldi¹, and Kyle Allen¹
¹University of Florida, Gainesville, FL

8:15 am–8:30 am

Low-Intensity Continuous Ultrasound Promotes Healing of Damaged Cartilage in a Pro-Inflammatory Environment

Anuradha Subramanian¹, Neety Sahu¹, and Hendrik Viljoen¹
¹University of Nebraska Lincoln, Lincoln, NE

8:30 am–8:45 am

miR-122 Prevents Associated Increases Inflammatory and Catabolic Molecules While miR-451 Exacerbates these Responses in an In Vitro Osteoarthritis Model

Kayla Scott¹, Madeline Hays¹, Zvi Schwartz^{1,2}, and Barbara Boyan^{1,3}
¹Virginia Commonwealth University, Richmond, VA, ²University of Texas, San Antonio, TX, ³Georgia Institute of Technology, Atlanta, GA

8:45 am–9:00 am

Manganese Dioxide Nanoparticles Protect Cytokine-Challenged Cartilage From Oxidative Stress

Shreedevi Kumar¹, Isaac Adjei¹, Shannon Brown¹, Olivia Liseth¹, and Blanka Sharma¹
¹University of Florida, Gainesville, FL

9:00 am–9:15 am

Recreating Cartilage Zonal Organization Using Spatially Patterned Microribbon-Based Hydrogels

Courtney Gegg¹ and Fan Yang¹
¹Stanford University, Stanford, CA

9:15 am–9:30 am

Mechanical Behavior Of Autologous Fibrin Sealants For Cartilage Repair

Rebecca Irwin¹, Jacqueline Commins¹, Itai Cohen¹, Lawrence Bonassar¹, and Lisa Fortier¹
¹Cornell University, Ithaca, NY

OP-Fri-1-18

Room A408

Track: Stem Cell Engineering, Biomaterials

Engineering the Stem Cell Microenvironment

Chairs: Elizabeth Lipke, Patrick Cahan

8:00 am–8:15 am

Low Intensity Ultrasound Prolongs Lifetimes of Mesenchymal Stem Cell Transplants Through Interferon- γ and Hypoxia Inducible Factor 1- α Signaling

Scott Burks¹, Rebecca Lorsung¹, and Joseph Frank¹
¹NIH Clinical Center, Bethesda, MD

8:15 am–8:30 am

Spatiotemporal Control of Cell Fate by Soluble Signal Patterning

Mary Regier^{1,2}, David Beebe², and Kelly Stevens¹
¹University of Washington, Seattle, WA, ²University of Wisconsin-Madison, Madison, WI

8:30 am–8:45 am

Distinct NADH Profile Discriminates Hematopoietic Stem and Progenitor Cells

Hao Zhou¹, Lisa Nguyen¹, Cosimo Arnesano¹, Yuta Ando¹, Scott Fraser¹, Rong Lu¹, and Keyue Shen¹
¹University of Southern California, Los Angeles, CA

8:45 am–9:00 am

Sphingolipidomic Profiles Reflect Metrics of Mesenchymal Stem Cell Immunomodulatory Potency

Molly Ogle¹, Nathan Chiappa¹, and Edward Botchwey¹
¹Georgia Institute of Technology, Atlanta, GA

9:00 am–9:15 am

Biomechanical Regulation of Stem Cell Differentiation for Vascularized Tissue Regeneration

Andrew Sligar¹, Jason Lee¹, Varsha Karanam¹, Chaarushena Deb¹, Victoria Le¹, and Aaron Baker¹
¹The University of Texas at Austin, Austin, TX

9:15 am–9:30 am

Directing Somatic Cell De-Differentiation Through Spheroid Engineering

Junmin Lee¹, Yanfen Li¹, and Kristopher Killian²
¹University of Illinois at Urbana-Champaign, Urbana, IL, ²University of New South Wales, Sydney, Australia

OP-Fri-1-19

Room A409

Track: Biomedical Engineering Education (BME)

Program Development & Assessment

Chairs: Susan Alexander, Colin Drummond

8:00 am–8:15 am

Discovery: Immersing Biomedical Engineering Graduate Instructors into High School STEM Curriculum

Locke Davenport Huyer¹, Neal Callaghan¹, and Dawn Kilkenny¹
¹Institute of Biomaterials & Biomedical Engineering, University of Toronto, Toronto, ON, Canada

8:15 am–8:30 am

Biomedical Engineering Training in Academic Hospitals without Engineering Program Affiliations

Keigo Kawaji^{1,2}, Marcella Vaicik^{1,2}, Christiana Corsi³, Satoshi Tamura⁴, Takeyoshi Ota², Timothy J. Carroll², and Amit R. Patel²
¹Illinois Institute of Technology, Chicago, IL, ²The University of Chicago, Chicago, IL, ³University of Bologna, Bologna, Italy, ⁴Gifu University, Gifu, Japan

8:30 am–8:45 am

Creating and Implementing a Shared Vision of Instructional Change in Biomedical Engineering

Aileen Huang-Saad¹, Jan Stegemann¹, and Lonnie Shea¹
¹University of Michigan, Ann Arbor, MI

8:45 am–9:00 am

The Engineering Design Process Applied to Teaching: Development of Mobile Application to Increase Student-Teacher Communication

John Hickey¹, Tony Jiang¹, Gabriel Fernandes¹, and Kelly Clark¹
¹Johns Hopkins University, Baltimore, MD

9:00 am–9:15 am

The Whitaker International Program: Outcomes and Lessons from 10 Years of Support for International Biomedical Research

Youseph Yazdi¹, Tejal Desai², Vladimir Hlady³, George Truskey⁴, Tom Skalak⁵, Frank Yin⁶, Daniel Kramer⁷, G Burt Holmes⁸, and Peter G Katona⁹
¹Johns Hopkins University, Baltimore, MD, ²UCSF, San Francisco, CA, ³Univ of Utah, Salt Lake City, UT, ⁴Duke University, Durham, NC, ⁵Paul Allen Foundation, Seattle, WA, ⁶Washington University, St. Louis, MO, ⁷IIE, New York, NY, ⁸Whitaker Foundation (Retired), New York, NY, ⁹George Mason University, Fairfax, VA

9:15 am–9:30 am

An Effective REU Model for Skill Development and Graduate School Matriculation

Andrew Smith¹, Marina Marjanovic¹, and Stephen Boppart¹
¹University of Illinois at Urbana-Champaign, Urbana, IL

SPECIAL SESSIONS

8:00 am–9:30 am

Room A301

Systems Thinking in the Education of Biomedical Engineering Students

Chairs: Eberhard Voit

This session is dedicated to discussions of innovative BME teaching modalities in the area of computational biomedical systems analysis and highlights novel ideas pertaining to classroom education in the rapidly emerging field of dynamical systems analysis in health and disease. The session begins with real-life illustrations from a critical care unit that set the stage by demonstrating the importance of systems-based biomedical engineering. The subsequent presentations describe different approaches toward fostering systems thinking in the next generation of biomedical engineers.

8:00 am–9:30 am

Room A311

Advanced Biomanufacturing Session I: Advanced Tissue Biofabrication

Chairs: Kaiming Ye

Advanced Biomanufacturing Special Interest Group (ABioM SIG) is pleased to organize two special sessions: “Advanced Cell Biomanufacturing” and “Tissue Biofabrication” to highlight grant challenges and R&D opportunities as well as workforce training in these emerging fields. Invited speakers include Director of National Institute for Innovation in Manufacturing Biopharmaceuticals (NIIMBL), Director of NSF Engineering Research Center (ERC) for Cell Manufacturing Technologies, Director of NIH Center for Engineering Complex Tissues, and pioneers and leaders in these fields.

8:00 am–9:30 am

Room A411

AAA-BMES Symposium: Engineering and Imaging the Stem Cell Niche for Guided Regeneration

Chairs: Scott Simon

This symposium will focus on anatomical and bio-engineering approaches. The theme of the symposium is multi-scale imaging and mechanical contributions to deriving stem cell derived therapeutic tissue growth with emphasis on the matrix and signaling events that are measurable using novel imaging and organoid-on-a-chip approaches.

OP-Fri-2-1

Sidney Marcus
Auditorium

Track: Biomaterials, Drug Delivery & Intelligent Systems

Biomaterials for Drug Delivery II

Chairs: Ester Kwon, Jungwoo Lee

1:15 pm–1:30 pm

Tissue Responses to Biodegradable Polymerized Simvastatin

David Puleo¹, Nandakumar Venkatesan¹, Thilanga Liyanage¹, Jaime Castro-Núñez¹, Theodora Asafo-Adjei¹, Thomas Dziubla¹, and Larry Cunningham¹

¹University of Kentucky, Lexington, KY

1:30 pm–1:45 pm

Chimeric Human Antimicrobial Peptide Tethering and Bioactivity on Collagen-Alginate Composite Dressings

Jonian Grosha¹, Lindsay Lozeau¹, Mateo Frare¹, Ramona Bago¹, Terri Camesano¹, and Marsha Rolle¹

¹Worcester Polytechnic Institute, Worcester, MA

1:45 pm–2:00 pm

Biocompatible Macrodevice for Long-Term Transplantation of Xenogeneic Therapeutic Cells

Suman Bose¹, Robert Langer², and Daniel Anderson³

¹MIT, Cambridge, MA, ²MIT, Cambridge, MA,

³Massachusetts Institute of Technology, Cambridge, MA

2:00 pm–2:15 pm

Noninvasive Refilling of Drug-Eluting Depots for Cancer Treatment

Yevgeny Brudno¹, Matthew Pezone², OKtay Uzun²,

Michael Aizenberg², and David Mooney³

¹University of North Carolina at Chapel Hill and North Carolina State University, Raleigh, NC, ²Wyss Institute, Boston, MA,

³Harvard University, Cambridge, MA

2:15 pm–2:30 pm

Long-Circulating amphiphilic Doxorubicin for Tumor Mitochondria-Specific Targeting

Jingchao Xi¹, Meng Li¹, Benxin Jing¹, Myunggi An¹, Chunsong Yu¹, Cameron Pinnock¹, Yingxi Zhu¹, Mai Lam¹, and Haipeng Liu^{1,2}

¹Wayne State University, Detroit, MI, ²Barbara Ann Karmanos Cancer Institution, Detroit, MI

2:30 pm–2:45 pm

Generation and Testing of a Novel Injectable Tissue Regeneration Matrix with Anti-Cancer Properties

Andrew Baldwin¹, Natalie Williams¹, Heather Gregory¹, Anastasia Frank-Kamenetski¹, and Brian Booth¹

¹Clemson University, Clemson, SC

OP-Fri-2-2

Room A312

Track: Biomaterials

Scaffolds I

Chairs: Catherine Whittington, Daniel Alge

1:15 pm–1:30 pm

In Vivo Preservation of Volume and Topographic Detail of Auricular Cartilage Using Biocompatible 3D-Printed Scaffold

Arash Samadi¹, Alexandra J. Lin¹, Jaime L. Bernstein¹, Matthew A. Wright¹, Daniel O. Lara¹, Benjamin Cohen², Justin S. Buro¹, Karel-Bart Celie¹, Yoshiko Toyoda¹, Alice Harper¹, Lawrence J. Bonassar², and Jason A. Spector^{1,2}

¹Laboratory of Bioregenerative Medicine and Surgery, Weill Cornell Medicine, New York City, NY, ²Meinig School of Biomedical Engineering, Cornell University, Ithaca, NY

1:30 pm–1:45 pm

Deminerized Bone Slices for Creating In Vitro Endosteal Niche

Yongkuk Park¹ and Jungwoo Lee¹

¹University of Massachusetts Amherst, Amherst, MA

1:45 pm–2:00 pm

The Design and Implementation of a 3D High Throughput Pilot Screen Targeting Medulloblastoma

Sigrid Langhans¹, Peter Worthington², and Darrin Pochan²

¹Nemours/Al DuPont Hospital for Children, Wilmington, DE,

²University of Delaware, Newark, DE

2:00 pm–2:15 pm

Manufacturing 3D Fiber Reinforced Hydrogels to Produce Mechanically Relevant Extracellular Matrices

Ashok Williams¹, James Nowak¹, Rachel Dass¹, Johnson Samuel¹, and Kristen Mills¹

¹Rensselaer Polytechnic Institute, Troy, NY

2:15 pm–2:30 pm

Engineering a Multifunctional Composite Hydrogel for Treatment of Dental Diseases

Ehsan Shirzaei Sani¹, Roberto Portillo Lara², Zahra Aldawood³, Giuseppe Intini³, and Nasim Annabi²

¹Northeastern University, Boston, MA, ²Northeastern University, Boston, MA, ³Division of Periodontology, Department of Oral Medicine, Infection, and Immunity, Harvard School of Dental Medicine, Boston, MA, USA, Boston, MA

2:30 pm–2:45 pm

Injectable and Self-Assembled Nano-Matrix for Stem Cell Homing

Anne Yau¹, Hongchuan Yu¹, Wei Guo², and Yupeng Chen¹

¹Brown University and Rhode Island Hospital, Providence, RI, ²Beijing Friendship Hospital and Capital Medical University, Beijing, China, People's Republic of

OP-Fri-2-3

Room A410

Track: Cancer Technologies

Precision Medicine in Cancer

Chairs: Sharon Gerecht, Kristen Naegle

1:15 pm–1:30 pm

Increasing the Accuracy of Single-Molecule mRNA FISH with Size-Minimized Quantum Dots

Yang Liu¹, Phuong Le¹, and Andrew Smith¹

¹University of Illinois at Urbana-Champaign, Urbana, IL

1:30 pm–1:45 pm

Targeting EGFR/HER2/HER3 with a Three-in-One Aptamer-siRNA Chimera Confers Superior Activity against HER2+ Breast Cancer

Hong Yan Liu¹, Xiaolin Yu¹, Sharad Ghamande¹, Lu Xue¹, and Nita Maihle¹

¹Augusta University, Augusta, GA

1:45 pm–2:00 pm

Multifunctional Barcoded gRNAs Enable Enhanced Lineage-Resolved Molecular Analysis

Aziz Al'Khafaji¹, Catherine Gutierrez², Russell Durrett¹, Catherine Wu³, and Amy Brock¹

¹University of Texas at Austin, Austin, TX, ²Harvard Medical School, Boston, MA, ³Dana-Farber Cancer Institute, Boston, MA

2:00 pm–2:15 pm

Single-Molecule Sequencing Reveals Patterns Of Pre-Existing Drug Resistance That Suggest Treatment Strategies In Philadelphia-Positive Leukemias

Justin Pritchard¹, Scott Leighow¹, Mike Schmitt², and Jerald Radich³

¹Pennsylvania State University, University Park, PA, ²University of Washington, Seattle, WA, ³Fred Hutchison Cancer Center, Seattle, WA

2:15 pm–2:30 pm

Protease-Activated Detection and Imaging of Cancer Metastasis

Liangliang Hao¹ and Sangeeta Bhatia¹

¹MIT, Cambridge, MA

2:30 pm–2:45 pm

Biomarker-Free Sorting of Rare Cells and Extracellular Vesicles by Magnetic Levitation

Gozde Durmus¹, Kaushik Sridhar¹, Rakhi Gupta¹, Ronald Davis¹, Lars Steinmetz¹, and Utkan Demirci²

¹Stanford University, Stanford, CA, ²Stanford University School of Medicine, Palo Alto, CA

INVITED

OP-Fri-2-4

Room A313

Track: Biomaterials

Biomaterials for Translational Applications

Chairs: Sharon Gerecht, Adam Feinberg

1:15 pm–1:30 pm

Biomimetic Sponges Enhance Skeletal Muscle Regeneration Following Volumetric Muscle Loss

Gabriel Haas¹, Andrew Dunn¹, Madison Marcinczyk¹, Muhamed Talovic¹, Mark Schwartz¹, Robert Scheidt¹, Anjali Patel¹, Katherine Hixon¹, Hady Elmashhady¹, Sarah McBride-Gagy¹, Scott Sell¹, and Koyal Garg¹

¹Saint Louis University, St. Louis, MO

1:30 pm–1:45 pm

Efficacy Testing of an Injectable Matrix Gel for the Treatment of Fatty Muscle Infiltration

Tai Huynh¹, Johntaehwan Kim¹, Grady Dunlap¹, Shahryar Ahmad², and Jeffrey Wolchok¹

¹University of Arkansas, Fayetteville, AR, ²UamS, Little Rock, AR

1:45 pm–2:00 pm

Myocardial Matrix Hydrogel Elicits Increased Thymidine Analog Incorporation in Cardiomyocyte Nuclei

Raymond Wang¹, Nuno Camboa¹, Paola Cattaneo¹, Sylvia Evans¹, and Karen Christman¹

¹University of California, San Diego, La Jolla, CA

2:00 pm–2:15 pm

Functionalization Of Polyetheretherketone With Extracellular Matrix For Improved Cell Attachment And Osteogenic Differentiation

Robert Reese¹, Robert Rogers², Eoin McNeill², Bret Clough³, Carl Gregory², and Roland Kaunas^{1,2}

¹Texas A&M University, College Station, TX, ²Texas A&M Health Science Center, College Station, TX, ³Texas A&M Health Science Center, Temple, TX

2:15 pm–2:30 pm

Implant Surface Properties Overcome Impaired Bone Remodeling to Promote Osseointegration

Ethan M. Lotz¹, D. Joshua Cohen¹, Zvi Schwartz¹, and Barbara D. Boyan¹

¹Virginia Commonwealth University, Richmond, VA

2:30 pm–2:45 pm

Fully-Defined Synthetic Matrices for Human Intestinal Stem Cell Expansion and Organogenesis

Victor Hernandez-Gordillo¹, Arinola Lampejo¹, Rebecca Carrier², David Breault³, and Linda Griffith¹

¹Massachusetts Institute of Technology, Cambridge, MA, ²Northeastern University, Boston, MA, ³Harvard Medical School, Boston, MA

OP-Fri-2-5

Room A314

Track: Biomechanics, Cellular and Molecular Bioengineering

Cellular and Molecular Biomechanics: Mechanobiology I

Chairs: Leo Wan, Daniel Conway

1:15 pm–1:30 pm

Myosin II Governs Intracellular Pressure and Traction Stress by Distinct Mechanisms

Kimheak Sao¹, Tia Jones¹, Andrew Doyle², Galina Schevzov³, Peter Gunning³, and Ryan Petrie¹
¹Drexel Biology, Philadelphia, PA, ²National Institutes of Health, Bethesda, MD, ³University of New South Wales, Sydney, Australia

1:30 pm–1:45 pm

Modulation of Macrophage Inflammatory Activation by Mechanical Stretch

Hamza Atcha¹, Vijaykumar S. Meli¹, Chase T. Davis¹, Sara Anis¹, Kyle T. Brumm¹, and Wendy F. Liu¹
¹University of California, Irvine, Irvine, CA

1:45 pm–2:00 pm

Boundary Integral Simulations of A Red Blood Cell Squeezing Through a Submicron Slit

Zhangli Peng¹ and Huijie Lu¹
¹University of Notre Dame, Notre Dame, IN

2:00 pm–2:15 pm

An Intact LINC Complex is Required for Acinar Development

Qiao Zhang¹, Vani Narayanan², Andrew Tamashunas¹, Daniel Conway², and Tanmay Lele¹
¹University of Florida, Gainesville, FL, ²Virginia Commonwealth University, Richmond, VA

2:15 pm–2:30 pm

Quantifying the Presentation of Cell-Cell Junctions: Evaluating the Mechanobiology of Brain Endothelium

Kelsey Gray¹, Dakota Katz¹, Erica Brown¹, and Kimberly Stroka¹
¹University of Maryland, College Park, MD

2:30 pm–2:45 pm

Lamin A/C Deficient Mice Reveal Normal Nuclear Shape *In Vivo*, but Abrogated Chromatin Organization And Intranuclear Mechanics

Soham Ghosh¹, Adrienne Scott¹, Jessica Kelly¹, Xin Xu¹, Benjamin Seelbinder¹, Stephanie Schneider¹, and Corey Neu¹
¹University of Colorado Boulder, Boulder, CO

OP-Fri-2-6

Room A315

Track: Biomechanics

Mechanobiology of Cell Adhesion

Chairs: Brenton Hoffman, Tae Yoon Kim

1:15 pm–1:30 pm

Conformational Switch, Activation and Clustering in Transmembrane Signaling and Mechanotransduction

Mohammad Mofrad¹
¹UC Berkeley, Berkeley, CA

1:30 pm–1:45 pm

Abrupt Transitions in Matrix Stiffness Create Endothelial Stress Concentrations

Jacob VanderBurgh^{1,2}, Archit Potharazu², and Cynthia Reinhart-King^{1,2}
¹Cornell University, Ithaca, NY, ²Vanderbilt University, Nashville, TN

1:45 pm–2:00 pm

EGFR Variant vIII Reduces Cell-Matrix Adhesion and Correlates with Invasive Glioblastoma

Afsheen Banisadr¹, Pranjali Beri¹, Frank Furnari¹, and Adam Engler¹
¹UC San Diego, La Jolla, CA

2:00 pm–2:15 pm

camP-PKA Dependent Cross-Regulation of Erythrocyte Adhesion in Sickle Cell Disease

Jing Zhang¹, Kostyantyn Partola¹, Biree Andemariam², and George Lykotrafitis¹
¹University of Connecticut, Storrs, CT, ²UConn Health, Farmington, CT

2:15 pm–2:30 pm

E-cadherin Binds to Desmoglein to Facilitate Desmosome Assembly

Omer Shafraz¹, Matthias Rübsam², Sara Stahley³, Amber Caldara³, Andrew Kowalczyk³, Carien Niessen², and Sanjeevi Sivasankar¹
¹Iowa State University, Ames, IA, ²University of Cologne, Cologne, Germany, ³Emory University School of Medicine, Atlanta, GA

2:30 pm–2:45 pm

A Mechanosensitive Role for Kindlin in the Integrin-Mediated Adhesion Complex

Zeinab Jahed¹, Zainab Haydari¹, Akshay Rathish¹, Hengameh Shams¹, and Mohammad Mofrad¹
¹University of California Berkeley, Berkeley, CA

OP-Fri-2-7

Room A316

Track: Biomedical Imaging and Instrumentation, Bioinformatics, Computational and Systems Biology

Imaging Data Science, Processing, Modeling and Informatics

Chairs: Ruogu Fang, Roarke Horstmeyer

1:15 pm–1:30 pm

Low-Dose CT Perfusion Image Restoration and Radiation Reduction

Yao Xiao¹, Peng Liu¹, and Ruogu Fang¹
¹University of Florida, Gainesville, FL

1:30 pm–1:45 pm

Evaluation of a User-Friendly Method for Regional Analysis of Cerebral Blood Perfusion Using SPECT-CT

Christian Konopka^{1,2}, Amanda Snyder¹, Quyen Nguyen¹, Iwona Dobrucki², Justin Rhodes^{1,2}, and Lawrence Dobrucki^{1,2}
¹University of Illinois, Urbana, IL, ²Beckman Institute for Advanced Science and Technology, Urbana, IL

1:45 pm–2:00 pm

Transfer Learning for Segmentation of Injured Lungs in Computed Tomography

Sarah Gerard¹, Jacob Herrmann¹, David Kaczka¹, and Joseph Reinhardt¹
¹University of Iowa, Iowa City, IA

2:00 pm–2:15 pm

Optimizing Spectral Properties of Sliding Window Correlation Analysis for Dynamic Brain Connectivity during Rest

Fatemeh Mokhtari¹, Milad Akhlaghi Bouzan², Sean Simpson³, and Paul Laurienti³
¹Virginia Tech-Wake Forest University School of Biomedical Engineering and Sciences, Winston Salem, NC, ²NA, Sunnyvale, CA, ³Wake Forest School of Medicine, Winston Salem, NC

2:15 pm–2:30 pm

Increased Crowding of Upper Cervical Spinal Canal in Adult Female CMI

Dipankar Biswas¹, Alaaddin Ibrahimy¹, Maggie Eppelheimer¹, James Houston¹, Jayapalli Bapuraj², and Francis Loth¹
¹The University of Akron, Akron, OH, ²University of Michigan, Ann Arbor, MI

2:30 pm–2:45 pm

A Safe, Low-Cost, Easy-to-Use 3D-Camera Platform to Assess Risk of Obstructed Labor Due to Cephalopelvic Disproportion

Rudolph Gleason^{1,2}, Mahlet Yigeremu³, Tequam Debebe³, Sisay Teklu³, Daniel Zewdeneh³, Lorenzo Tolentino², Michael Weiler⁴, Nate Frank⁴, Shehab Attia¹, J. Brandon Dixon¹, Catherine Kwon¹, Anastassia Pokutta-Paskaleva¹, and Katie Gleason²
¹Georgia Institute of Technology, Atlanta, GA, ²Because of Kennedy, Inc., Acworth, GA, ³Addis Ababa University, Addis Ababa, Ethiopia, ⁴LymphaTech, Inc., Atlanta, GA

OP-Fri-2-8

Room A302

Track: Tissue Engineering, Orthopedic and Rehabilitation Engineering

Musculoskeletal Tissue Engineering III

Chairs: Teja Guda, Jennifer Puetzer

1:15 pm–1:30 pm

Maturation and Disease of Human Neuro-Muscular Connectivity Revealed Through Optogenetics

Olaia Vila¹, Sebastien Uzel², Stephen Ma¹, Damian Williams¹, Joey Pak¹, Roger Kamm², and Gordana Vunjak-Novakovic¹
¹Columbia University, New York, NY, ²Massachusetts Institute of Technology, Cambridge, MA

1:30 pm–1:45 pm

Skeletal Muscle-Macrophage Platform for Modeling Tissue Regeneration

Mark Juhas¹, Nadia Abutaleb¹, Jason Wang¹, Jean Ye¹, Zohaib Shaikh¹, Chaichontat Sriworarat¹, Ying Qian¹, and Nenad Bursac¹
¹Duke University, Durham, NC

1:45 pm–2:00 pm

Tissue-Engineered Human Skeletal Muscle Model Of Pompe Disease

Jason Wang¹, Chris Zhou¹, Alastair Khodabukus¹, Priya Kishnani¹, Dwight Koeberl¹, and Nenad Bursac¹
¹Duke University, Durham, NC

2:00 pm–2:15 pm

Development of a Human Tissue-Engineered Model of Duchenne Muscular Dystrophy

Alastair Khodabukus¹, Neel Prabhu¹, and Nenad Bursac¹
¹Duke University, Durham, NC

2:15 pm–2:30 pm

Fluid-Induced Pulsatile Shear Stress Enhances Tissue-Engineered Articular Cartilage Properties

Evelia Salinas¹, Ashkan Aryaei², Nikolaos Paschos², Eric Berson³, Jerry Hu¹, and Kyriacos Athanasiou¹
¹University of California-Irvine, Irvine, CA, ²University of California, Davis, Davis, CA, ³University of Louisville, Kentucky, Louisville, KY

2:30 pm–2:45 pm

Combined Drug and Electrical Stimulation Synergistically Increase Contractile Function Of Engineered Human Skeletal Muscle

Alastair Khodabukus¹, Neel Prabhu¹, and Nenad Bursac¹
¹Duke University, Durham, NC

OP-Fri-2-9

Room A305

Track: Device Technologies and Biomedical Robotics

Assistive Technologies

Chair: Chaoyang Chen

1:15 pm–1:30 pm

A Novel Approach for Automatic Visualization and Activation Detection of Evoked Potentials Induced by Epidural Spinal Cord Stimulation in Individuals with Spinal Cord Injury

Samineh Mesbah¹, Claudia Angeli¹, Robert Keynton¹, Ayman El-baz¹, and Susan Harkema¹

¹University of Louisville, Louisville, KY

1:30 pm–1:45 pm

Development of a Semi-Automated Curb-Climbing Robotic Wheelchair to Overcome Environmental Barriers

Jorge Candiotti^{1,2}, Cheng-Shiu Chung^{1,2}, Brandon Daveler^{1,2}, Deepan Kamaraj^{1,2}, Garrett Grindle^{1,2}, and Rory Cooper^{1,2}

¹University of Pittsburgh, Pittsburgh, PA, ²Human Engineering Research Laboratories, Pittsburgh, PA

1:45 pm–2:00 pm

Portable Pneumatic Haptic Interface for Upper Limb Prosthetic Devices

Joshua Lee¹, Lewis A. Wheaton¹, and Frank L. Hammond III¹

¹Georgia Institute of Technology, Atlanta, GA

2:00 pm–2:15 pm

Design, Development, and Validation of an Approach to Shift and Lift Patients Intraoperatively: Towards Fast and Safe Repositioning of Patients Between Supine and Lithotomy

Dani Kiyasseh¹, Rene Lopez¹, Daniel Borders¹, Michael Morikubo¹, Chukwuebuka Achebe¹, Isabella Marintelli¹, Paroma Mukhopadhyay¹, Hana Escovar¹, Jacob Caldwell¹, Clark Johnson², Edith Gurewitsch², and Amir Manbachi¹

¹Johns Hopkins University, Baltimore, MD, ²Johns Hopkins Hospital, Baltimore, MD

2:15 pm–2:30 pm

Occupational Therapy Assistance Using a Humanoid Robot

Nicholas Scannell¹, Mohammad Rahman¹, Maysam Ardehali¹, Roger Smith¹, and Qussai Obiedat¹

¹University of Wisconsin–Milwaukee, Milwaukee, WI

OP-Fri-2-10

Room A401

Track: Cardiovascular Engineering, Biomedical Imaging and Instrumentation

Imaging in Cardiovascular Systems

Chairs: Craig Goergen, Lucas Timmins

1:15 pm–1:30 pm

Cerebral Aneurysm Flow Assessment using 4D Flow MRI, Volumetric PIV and CFD Data

Sean Rothenberger¹, Joseph Muskat¹, Melissa Brindise¹, Susanne Schnell², Michael Markl², David Saloner³, Pavlos Vlachos¹, and Vitaliy Rayz¹

¹Purdue University, West Lafayette, IN, ²Northwestern University, Evanston, IL, ³University of California San Francisco, San Francisco, CA

1:30 pm–1:45 pm

Development of Novel Organic Fluorescent Nanoparticles Emitting in the Second Near Infrared (NIR-II) Window for Targeting and Imaging of Atherosclerosis in Mice

Jiahui Zhang¹, Karimulla Mulla², Sandeep Kumar¹, Chunyan Li³, Dong-Won Kang¹, Qiangbin Wang³, Eilaf Egap², and Hanjoong Jo¹

¹Georgia Institute of Technology & Emory University, Atlanta, GA, ²Rice University, Houston, TX, ³Suzhou Institute of Nano-Tech and Nano-Bionics, Suzhou, China, People's Republic of

1:45 pm–2:00 pm

Assessment of the Mitral Valve After Infarction Through Clinical Imaging

Bruno Rego¹, Amir Khalighi¹, Robert Gorman², Joseph Gorman², and Michael Sacks¹

¹University of Texas at Austin, Austin, TX, ²University of Pennsylvania, Philadelphia, PA

2:00 pm–2:15 pm

Evaluation of Surgical and Imaging Techniques to Quantify Perfusion Recovery after Hindlimb Ischemia

Alyssa B Becker¹ and Brent A French¹

¹University of Virginia, Charlottesville, VA

2:15 pm–2:30 pm

Age and Gender Associated Changes in Aortic Valve Health Measured by Echocardiography

Mark Vander Roest¹ and W. David Merryman¹

¹Vanderbilt University, Nashville, TN

2:30 pm–2:45 pm

Imaging of Microcalcifications and Ruptured Caps in Human Atherosclerotic Plaques using Contrast Enhanced High Resolution Micro Computed Tomography

Luis Cardoso¹ and Sheldon Weinbaum¹

¹City College of New York, New York, NY

OP-Fri-2-11

Room A403

Track: Cardiovascular Engineering,
Tissue Engineering

Vascular Tissue Engineering

Chairs: David Rubenstein, Bin Jiang

1:15 pm–1:45 pm

Translation of the Tissue Engineered Vascular Graft (TEVG) From the Bench to the Bedside and Back Again **INVITED**

Christopher Breuer¹

¹Nationwide Children's Hospital, Columbus, OH

1:45 pm–2:00 pm

Cell Response on PPF/Pericardium Biohybrid Scaffolds for Vascular Tissue Engineering Applications

Megan Kmicata^{1,2}, Jules Allbritton-King^{1,2}, Prateek Swamykumar^{1,2}, Marco Santoro^{1,2}, and John Fisher^{1,2}

¹University of Maryland, College Park, MD, ²Center for Engineering Complex Tissues, College Park, MD

2:00 pm–2:15 pm

Natural Acellular and Cellular Small-Diameter Tissue Engineered Vascular Grafts as Arterial Conduits

Morgan Elliott^{1,2}, Brian Ginn², Takuma Fukunishi¹, Djahida Bedja¹, Abhilash Suresh², Hal Dietz¹, Lakshmi Santhanam¹, Hai-Quan Mao^{1,2}, Narutoshi Hibino¹, and Sharon Gerecht^{1,2}

¹Johns Hopkins University School of Medicine, Baltimore, MD, ²Johns Hopkins University, Whiting School of Engineering, Baltimore, MD

2:15 pm–2:30 pm

In-flow Preparation of Collagen Sheets with Tunable Fibril Alignment for the Engineering of Arterial Substitutes that Recapitulate Blood Vessel Microstructure

David Miranda-Nieves¹, Shashi Malladi², Carolyn Haller³, Axel Guenther², and Elliot Chaikof^{1,3}

¹Massachusetts Institute of Technology, Cambridge, MA, ²University of Toronto, Toronto, ON, Canada, ³Beth Israel Deaconess Medical Center, Boston, MA

2:30 pm–2:45 pm

Translation of the Tissue Engineered Vascular Graft (TEVG) From the Bench to the Bedside and Back Again

Christopher Breuer¹

¹Nationwide Children's Hospital, Columbus, OH

OP-Fri-2-12

Room A404

Track: Cellular and Molecular Bioengineering

Young Innovators of Cellular and Molecular Bioengineering: Part II

Chairs: Mike King, Cynthia Reinhart-King, William Bentley

1:15 pm–1:30 pm

Layer-by-Layer Assembled Gold Nanoshells for the Intracellular Delivery of miR-34a

Emily Day¹

¹University of Delaware, Newark, DE

1:30 pm–1:45 pm

Lipid Polymer Hybrid Nanomaterials for mRNA Delivery

Yizhou Dong¹

¹Ohio State University, Columbus, OH

1:45 pm–2:00 pm

Graphene Microelectrode Arrays for Electrical and Optical Measurements of Human Stem Cell-Derived Cardiomyocytes

Tzahi Cohen-Karni¹

¹Carnegie Mellon University, Pittsburgh, PA

2:00 pm–2:15 pm

The Role of Desmoplasia and Stromal Fibroblasts on Anti-Cancer Drug Resistance in a Microengineered Tumor Model

Mehdi Nikkah¹

¹Arizona State University, Tempe, AZ

2:15 pm–2:30 pm

Synergy of Paracrine Signaling in Early-Stage Mouse Ovarian Follicle Development *In Vitro*

Ariella Shikanov¹

¹University of Michigan, Ann Arbor, MI

OP-Fri-2-13

Room A405

Track: Nano and Micro Technologies,
Cancer Technologies

Photoresponsive Nanomedicines and Immunotherapies for Cancer

Chairs: Erik Dreaden, Huang Chiao Huang

1:15 pm–1:30 pm

Protoporphyrin IX (PpIX)-Coated Superparamagnetic Iron Oxide Nanoparticle (SPION) Nanoclusters for Magnetic Resonance Imaging and Photodynamic Therapy

Ahmad Amirshaghghi¹, Lesan Yan¹, Dennis Huang¹, Joann Miller¹, Joel M Stein¹, Theresa M Busch¹, Zhiliang Chen¹, and Andrew Tsourkas¹

¹University of Pennsylvania, Philadelphia, PA

1:30 pm–1:45 pm

Indocyanine Green Coated Gold Nanoclusters for Photoacoustic Imaging and Photothermal Therapy

Elizabeth Higbee-Dempsey¹, Ahmad Amirshaghghi¹, and Andrew Tsourkas¹

¹University of Pennsylvania, Philadelphia, PA

1:45 pm–2:00 pm

PD-1 Blockade Cellular Vesicles for Cancer Immunotherapy

Xudong Zhang¹, Chao Wang¹, Jinqiang Wang¹, Gianpietro Dotti¹, Peng Huang², and Zhen Gu¹

¹University of North Carolina at Chapel Hill and North Carolina State University, Raleigh, NC, ²Shenzhen University, Shenzhen, China, People's Republic of

2:00 pm–2:15 pm
Significant Cure Rate for Mice with Breast Cancer Treated by Targeted Photothermal Therapy Combined With Immunostimulation

Patrick McKernan¹, Rajagopal Ramesh², Linda Thompson³, and Roger Harrison¹

¹University of Oklahoma, Norman, OK, ²University of Oklahoma Health Sciences Center, Oklahoma City, OK, ³Oklahoma Medical Research Foundation, Oklahoma City, OK

2:15 pm–2:30 pm
Engineered CpG-Loaded Prussian Blue Nanoparticles as Nanoimmunotherapy Agents for Cancer

Juliana Cano-Mejia¹, Michelle Bookstaver¹, Elizabeth Sweeney², Christopher Jewell¹, and Rohan Fernandes²

¹University of Maryland, College Park, MD, ²George Washington University, Washington, DC

2:30 pm–2:45 pm
Combination Chemo-Photothermal Immunotherapy Exerts Potent Anti-Tumor Efficacy Against Advanced Metastatic Cancer

Jutaek Nam¹, Sejin Son¹, Lukasz Ochyl¹, Rui Kuai¹, and James Moon¹

¹University of Michigan, Ann Arbor, MI

OP-Fri-2-14

Room A406

Track: Nano and Micro Technologies, Drug Delivery & Intelligent Systems

Nanotechnologies for Drug and Nucleic Acid Delivery and Immunotherapy

Chairs: Rohan Fernandes, Omid Veisesh

1:15 pm–1:30 pm
Programmable Control of Toll-Like Receptor Signaling Using Rational Assembly of Immune Signals

Christopher Jewell^{1,2}

¹University of Maryland, College Park, MD, ²United States Veterans Affairs, Baltimore VA Medical Center, Baltimore, MD

1:30 pm–1:45 pm
Targeting The Latent HIV Reservoir Via HIV-1-Mimetic Nanocarriers

Sophia Li¹, Joonhee Park², Nicholas Karabin¹, Sean Allen¹, Jaehyuk Choi², Thomas Hope², and Evan Scott¹

¹Northwestern University, Evanston, IL, ²Feinberg School of Medicine, Chicago, IL

1:45 pm–2:00 pm
Development of a Non-Viral platform for the Delivery of CRISPR/Cas complexes

Piyush Jain^{1,2}, Justin Lo^{1,3}, Apekshya Panda¹, Srivatsan Raghavan⁴, Michelle Tai^{1,5}, and Sangeeta Bhatia^{1,6}

¹Massachusetts Institute of Technology, Cambridge, MA, ²University of Florida, Gainesville, FL, ³Vanderbilt University Medical Center, Nashville, TN, ⁴Dana-Farber Cancer Institute, Boston, MA, ⁵Genentech, Inc, San Francisco, CA, ⁶Howard Hughes Medical Institute, Cambridge, MA

2:00 pm–2:15 pm
RIG-Ing The Tumor Microenvironment Using pH-Responsive Polymers and 5' Triphosphate RNA

Max Jacobson¹, Lihong Bishop¹, Kyle Becker¹, Olga Fedorova², Anna Pyle², and John Wilson¹

¹Vanderbilt University, Nashville, TN, ²Yale University, New Haven, CT

2:15 pm–2:30 pm
Probing Structure-Function Relationships to Optimize Liposomal Spherical Nucleic Acids for RNAi

Andrew Sinegra^{1,2}, Andrew Lee^{1,2}, Alexander Stegh^{2,3}, and Chad Mirkin^{1,2}

¹Northwestern University, Evanston, IL, ²International Institute for Nanotechnology, Evanston, IL, ³Northwestern University, Chicago, IL

2:30 pm–2:45 pm
Biomimetic Anisotropic Red Blood Cell-Coated Nanoparticles for Enhanced Drug Delivery and Toxin Neutralization

Elana Ben-Akiva¹, Randall Meyer¹, Jonathan Smith¹, and Jordan Green¹

¹Johns Hopkins University, Baltimore, MD

OP-Fri-2-15

Room A407

Track: Bioinformatics, Computational and Systems Biology

Synthetic Biology, Cell System Engineering, and Related Technologies

Chairs: Casim Sarkar, Benjamin Cosgrove

1:15 pm–1:30 pm
De Novo Natural Product Design Enabled by Deep Enzyme Mining and Empirical Characterization

Robert Warden-Rothman^{1,2}, Brianna Williams³, Cassandra Bristol², Michael Fischbach³, D. Benjamin Gordon^{1,2}, and Christopher Voigt^{1,2}

¹Massachusetts Institute of Technology, Cambridge, MA, ²Broad Institute of MIT and Harvard, Cambridge, MA, ³Stanford University, Stanford, CA

1:30 pm–1:45 pm
High-Throughput Multicolor Optogenetics for the Systematic Dissection of Mammalian Cell Signaling

Lukasz Bugaj¹, Xin Xiong², and Wendell Lim²

¹University of Pennsylvania, Philadelphia, PA, ²University of California, San Francisco, San Francisco, CA

1:45 pm–2:00 pm
Programmable Protein Circuits in Living Cells

Xiaojing Gao¹, Lucy Chong¹, Matthew Kim¹, and Michael Elowitz¹

¹Caltech, Los Angeles, CA

2:15 pm–2:30 pm
Shining Light on Transcription Factor Activity Dynamics

Kieran Sweeney¹ and Megan McClean¹

¹UW-Madison, Madison, WI

2:30 pm–2:45 pm

Metabolic Division Of Labor In Microbial Systems

Ryan Tsoi¹, Feilun Wu¹, Carolyn Zhang¹, Sharon Bewick², David Karig³, and Lingchong You¹

¹Duke University, Durham, NC, ²University of Maryland, College Park, MD, ³Johns Hopkins University, Baltimore, MD

2:45 pm–3:00 pm

Multiplexed Analysis of *In Vitro* Neurogenesis by Single-cell Mass Cytometry to Rapidly Profile Distinct Neural Subtypes and their Intermediate Phenotypes

Kristen Fread¹, Amy Van Deusen¹, Corey Williams¹, and Eli Zunder¹

¹University of Virginia, Charlottesville, VA

OP-Fri-2-16

Room A303

Track: Neural Engineering

Neural Cell Model Systems

Chairs: Ryan Gilbert, Levi Wood

1:15 pm–1:30 pm

Modeling the Variability of Spontaneous Astrocyte Calcium Activity and Responses to Repeated Stimuli

Marsa Taheri¹, Alan D. Dorval¹, and John A. White²

¹University of Utah, SLC, UT, ²Boston University, Boston, MA

1:30 pm–1:45 pm

Combination of Aligned Electrospun Fibers and TGF β Reduces the Reactivity of Cultured Astrocytes

Manoj Gottipati^{1,2}, Anthony D'amato¹, Alexis Ziemba¹, Phillip Popovich², and Ryan Gilbert¹

¹Rensselaer Polytechnic Institute, Troy, NY, ²The Ohio State University, Columbus, OH

1:45 pm–2:00 pm

Time-Dependent Addition of Neuronal and Schwann Cells Increase Myotube Viability and Length in an *In Vitro* Neuromuscular Junction Tri-Culture Model

Tanya Singh¹ and Maribel Vazquez¹

¹The City College of New York (CUNY), New York, NY

2:00 pm–2:15 pm

Neuro-Epithelial Signaling in a Dish: Examining Diet-Induced Changes in Enteric Function

Marissa Puzan¹, Sanjin Husic¹, Brooke Wojeski¹, Ryan Koppes¹, and Abigail Koppes¹

¹Northeastern University, Boston, MA

2:15 pm–2:30 pm

Gut-Brain-Axis on a Chip: Enteroendocrine Cells as Sensory Transducers in the Gut

Minhal Ahmed^{1,2}, Marissa Puzan¹, Ryo Hotta², Allan Goldstein², and Abigail Koppes¹

¹Northeastern University, Boston, MA, ²Massachusetts General Hospital and Harvard Medical School, Boston, MA

2:30 pm–2:45 pm

Functional Outcomes of Neuron-Muscle Crosstalk in Early *In Vitro* Development

Onur Aydin¹, Austin Passaro², Mohamed Elhebeary¹, Gelson Pagan-Diaz¹, Anthony Fan¹, Sittinon Nuethong¹, Rashid Bashir¹, Steven Stice², and Taher Saif¹

¹University of Illinois at Urbana-Champaign, Urbana, IL, ²University of Georgia, Athens, GA

OP-Fri-2-17

Room A304

Track: Orthopedic and Rehabilitation Engineering

Muscle and Tendon

Chairs: Sarah Greising, Vincent Wang

1:15 pm–1:30 pm

Tendon Multiscale Mechanics and Damage are Affected by Osmolality of Bath Solution

Ellen Bloom¹, Andrea Lee¹, and Dawn Elliott¹

¹University of Delaware, Newark, DE

1:30 pm–1:45 pm

Functionally Graded Biomaterials for Rotator Cuff Repair

Elmer Ker¹, Michelle Wang¹, Emilie Cheung¹, and Yunzhi Yang¹

¹Stanford University, Stanford, CA

1:45 pm–2:00 pm

IKK β /NF- κ B Activation Drives Chronic Rotator Cuff Tendinopathy

Adam Abraham¹, Shivam Shah², Mikhail Golman¹, Xiaoning Li¹, Lee Song¹, Moeed Akbar³, Neal Millar³, Yousef Abu-Amer², and Stavros Thomopoulos¹

¹Columbia University, New York, NY, ²Washington University in St. Louis, St. Louis, MO, ³Glasgow University, Glasgow, United Kingdom

2:00 pm–2:15 pm

The Effects Of Physical Activity On Recovery From Volumetric Muscle Loss With Autologous Repair

Richard Perry¹, John Kim², Wesley Haynie², Tyrone Washington², and Jeffrey Wolchok²

¹University of the Ozarks, Clarksville, AR, ²University of Arkansas, Fayetteville, AR

2:15 pm–2:30 pm

Immobilization by Casting Causes Muscle Atrophy in Different Strains of Mice

Camilla Reina Maroni^{1,2}, Michael Friedman¹, Yue Zhang¹, and Henry Donahue¹

¹Virginia Commonwealth University, Richmond, VA, ²University "G. d'Annunzio" Chieti-Pescara, Chieti, Italy

2:30 pm–2:45 pm

Rehabilitative Exercise and Spatially Patterned Nanofibrillar Scaffolds for Treatment of Volumetric Muscle Loss

Ngan Huang^{1,2}, Karina Nakayama^{1,2}, Cynthia Alcazar², Guang Yang¹, Marco Quarta², and Thomas Rando²

¹Stanford University, Stanford, CA, ²Veterans Affairs Palo Alto Health Care System, Palo Alto, CA

OP-Fri-2-18

Room A408

Track: Stem Cell Engineering

Controlling Stem Cell Differentiation Using Novel Technologies

Chairs: Brendan Harley, Yan Li

1:15 pm–1:30 pm

Regulating Stem Cell Phenotype Using CRISPR Epigenome EditingDavid Ede¹, Jake Weston¹, Niloofer Farhang¹, and Robert Bowles¹
¹University of Utah, SLC, UT

1:30 pm–1:45 pm

Engineering Human Muscle-derived Stem Cells with Magnetic Iron Oxide NanoparticlesLinlin Zhang¹, Sheng Tong¹, and Gang Bao¹
¹Rice University, Houston, TX

1:45 pm–2:00 pm

Engineering Cellular Therapeutics to Rescue Muscular Denervation AtrophyLeeAnn Li¹, Danny Wen-Chin Huang¹, Xili Ding¹, Yuan-Yu Hsueh¹, and Song Li¹
¹UCLA, Los Angeles, CA

2:00 pm–2:15 pm

Gene Correction of Diabetes-Causing Mutation in Human Stem Cell-Derived & β CellsKristina G Maxwell^{1,2}, Fumihiko Urano², and Jeffrey R Millman^{1,2}
¹Washington University in St. Louis, St. Louis, MO,
²Washington University School of Medicine, St. Louis, MO

2:15 pm–2:30 pm

On the Measurement of Energy Dissipation of Adherent Cells with Quartz Crystal Microbalance with Dissipation MonitoringAmir Monemian Esfahani¹ and Ruiguo Yang¹
¹University of Nebraska-Lincoln, Lincoln, NE

2:30 pm–2:45 pm

Nanoparticle-mediated Morphogen Delivery to Instruct Mesenchymal Stem Cell SpheroidsJacklyn Whitehead¹, Alefia Kothambawala¹, and J. Kent Leach^{1,2}
¹University of California, Davis, Davis, CA, ²University of California, Davis, Sacramento, CA**SPECIAL SESSIONS**

1:15 pm–2:45 pm

Room A311

Advanced Biomanufacturing Session II: Advanced Cell Biomanufacturing

Chairs: Kaiming Ye

Advanced Biomanufacturing Special Interest Group (ABioM SIG) is pleased to organize two special sessions: "Advanced Cell Biomanufacturing" and "Tissue Biofabrication" to highlight grant challenges and R&D opportunities as well as workforce training in these emerging fields. Invited speakers include Director of National Institute for Innovation in Manufacturing Biopharmaceuticals (NIIMBL), Director of NSF Engineering Research Center (ERC) for Cell Manufacturing Technologies, Director of NIH Center for Engineering Complex Tissues, and pioneers and leaders in these fields.

1:15 pm–2:45 pm

Room A409

Engineering Solutions to Health Care Disparities

Chairs: Gilda Barabino

Health and health care disparities remain a costly and burdensome challenge in the U.S. and pose a serious threat to continued improvement in overall quality of care and population health. Biomedical engineers are well positioned to employ novel biodesign strategies toward the elimination of these disparities. This interactive session will explore approaches for research and education related to the application of biomedical technologies and engineering designs to solve health disparities. The session will feature outstanding designs developed in the 2018 BMES Coulter College.

1:30 pm–4:30 pm

Room A301

BMES-NSF Special Session on CAREER and UNSOLICITED Awards

Chairs: None

Preregistration Required

BMES and the National Science Foundation (NSF) have partnered to convene a special session focused on innovative research in biomedical engineering and grant writing. The session will bring together NSF Bioengineering and Engineering Healthcare grantees, young investigators, junior and senior faculty, and post-doctoral fellows for idea exchange and networking related to conducting and funding cutting-edge research in BME. The session will showcase NSF funded research and researchers, foster collaboration and idea exchange, familiarize participants with NSF funding mechanisms, and provide strategies for preparing competitive grant proposals, in particular NSF CAREER and unsolicited grant applications. The session is funded through the National Science Foundation. This material is based upon work supported by the National Science Foundation under Grant No. CBET - 1824363. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.

OP-Fri-3-1

Room A311

Track: Biomaterials

Characterizing and Modeling the Microenvironment

Chairs: Jeffrey Jacot, Sanjay Kumar

3:30 pm–3:45 pm**Building a 3D-Cultured Microphysiological Model of a Lymph Node with Microfluidic Photopatterning**Rebecca Pompano¹ and Jennifer Ortiz-Cardenas¹
¹University of Virginia, Charlottesville, VA**3:45 pm–4:00 pm****How to Make T cells Comfortable: Engineering Artificial Lymph Nodes for Effective Tumor Immunotherapy**John Hickey¹, Yi Dong¹, Jae Wook Chung¹, Sebastian Salathe¹, Xiaowei Li¹, Hai-Quan Mao¹, and Jonathan Schneck¹
¹Johns Hopkins University, Baltimore, MD**4:00 pm–4:15 pm****Biomaterial Immune Niches for Generating Strong and Persistent Humoral Immune Responses**Luo Gu^{1,2}, Alex Najibi², Maxence Dellacherie², Ting-Yu Shih², Aileen Li², Des White², and David Mooney²
¹Johns Hopkins University, Baltimore, MD, ²Harvard University, Cambridge, MA**4:15 pm–4:30 pm****Microengineered Amniotic Ectoderm Tissue Array for High-content Developmental Profiling**Sajedah Nasr Esfahani¹, Yue Shao², Agnes Resto Irizarry¹, Zida Li¹, Xufeng Xue¹, and Jianping Fu¹
¹University of Michigan, Ann Arbor, MI, ²Massachusetts Institute of Technology, Cambridge, MA**4:30 pm–4:45 pm****Effects of Extracellular Matrix Degradation on Cardiac Cell Function in the Context of Developmental Age**Luke Perreault¹, Ross Bretherton¹, Whitney Stoppel¹, Breanna Duffy¹, Elizabeth Porter¹, and Lauren Black¹
¹Tufts University, Medford, MA**4:45 pm–5:00 pm****Characterization of Decellularized Porcine Tongue: A Matrix for 3D *In Vitro* Head and Neck Cancer Models**Jacqueline Kort Mascort¹, Salvador Flores Torres¹, Tao Jiang¹, Jose Gil Munguia Lopez¹, and Joseph Matt Kinsella¹
¹McGill University, Montreal, QC, Canada

OP-Fri-3-2

Room A312

Track: Biomaterials

Scaffolds II

Chairs: Catherine Whittington, Daniel Alge

3:30 pm–3:45 pm***In Vitro* Differentiation of BMSCs in PGH and Gelatin Hydrogels**Adam Chin¹, Jingming Chen¹, Tyler Swenson¹, Juan Taboas¹, and Alejandro Almarza¹
¹University of Pittsburgh, Pittsburgh, PA**3:45 pm–4:00 pm****Modular, Plasmin-Sensitive Clickable PEG-Laminin Microsphere-Based Scaffolds for Peripheral Nerve Regeneration**Hao Meng¹ and Donald Elbert¹
¹University of Texas at Austin, Austin, TX**4:00 pm–4:15 pm****Electrospun Nanofiber Scaffolds for Anterior Cruciate Ligament Reconstruction**David Brennan¹ and Vince Beachley¹
¹Rowan University, Glassboro, NJ**4:15 pm–4:30 pm****Electrospun Aspirin-Triggered Resolvin D1-Loaded Nanofibers Promote the Accumulation of Pro-Regenerative Immune Cell-Subsets for Applications in Tissue Engineering.**Thomas Turner¹, Caitlin Sok¹, and Edward Botchwey¹
¹Georgia Institute of Technology, Atlanta, GA**4:30 pm–4:45 pm****Hypoxia-mimicking Scaffolds to Generate an *In Vivo* Localized Hypoxic Microenvironment**Hak Rae Lee¹, Faith Leslie¹, and Samira Azarin¹
¹University of Minnesota—Twin Cities, Minneapolis, MN**4:45 pm–5:00 pm****Auto-Wrapping External Device to Prevent Vascular Stenosis**Jeong-Kee Yoon¹, Dae-Hyun Kim¹, Young Min Shin¹, Jong-Won Ha¹, and Hak-Joon Sung¹
¹Yonsei University, Seoul, Korea, Republic of

OP-Fri-3-3

Room A410

Track: Cancer Technologies, Biomechanics

Cancer Mechanobiology

Chairs: Marjan Rafat, Laura Suggs

3:30 pm–3:45 pm

Correlating Mechanical and Gene Expression Data on Single Cell Level to Investigate Metastasis

Katherine Young^{1,2}, Corey Landry^{1,2}, Craig Forest¹, John McDonald¹, and Todd Sulchek^{1,2}

¹Georgia Institute of Technology, Atlanta, GA, ²Emory University, Atlanta, GA

3:45 pm–4:00 pm

Enhanced Stiffness Promotes Malignant Phenotypes Through Sp1-Mediated Epigenomic Alterations

Ryan Stowers¹, Johnny Israeli¹, Joshua Gruber¹, Michael Snyder¹, Anshul Kundaje¹, and Ovijit Chaudhuri¹

¹Stanford University, Stanford, CA

4:00 pm–4:15 pm

Topotaxis: A New Mechanism of Directed Cell Migration in Topographic ECM Gradients

JinSeok Park¹, Deok-Ho Kim², and Andre Levchenko¹

¹Yale Systems Biology Institute, West Haven, CT,

²University of Washington, Seattle, WA

4:15 pm–4:30 pm

Metastatic Potential of Breast Cancer Cells is Indicated by Adhesion Strength

Pranjali Beri¹, Anna Popravko¹, Alyssa Chiang¹, Jesse Placone¹, Afsheen Banisadr¹, and Adam Engler¹

¹UCSD, San Diego, CA

4:30 pm–4:45 pm

Feeling the Squeeze: How Motile Cells Respond to Different Types of Compression

Panagiotis Mistrionis¹, Emily Wisniewski¹, Robert Law¹, Kaustav Bera¹, Soontorn Tuntithavornwat¹, Nicolas Perez¹, Alexandros Afthinos¹, Runchen Zhao¹, Eda Erdogmus¹, Catharine Wain¹, Sean X. Sun¹, Petr Kalab¹, and Konstantinos Konstantopoulos¹

¹Johns Hopkins University, Baltimore, MD

OP-Fri-3-4

Room A313

Track: Biomaterials, Nano and Micro Technologies

Chips and Devices

Chairs: Lisa McCawley, YongTae Kim

3:30 pm–3:45 pm

A Novel Technique of Self-Assembling and Characterizing 3D Soft Tissues on Microfabricated Sensor Platform

Mohamed Elhebeary¹ and Taher Saif¹

¹University of Illinois Urbana Champaign, Urbana, IL

3:45 pm–4:00 pm

Brain High-Density Lipoprotein Engineered for Advanced Delivery of Microglial Ion Channel Inhibitors in Alzheimer's Disease

Jinhwan Kim¹, Song Ih Ahn¹, and YongTae Kim¹

¹Georgia Institute of Technology, Atlanta, GA

4:00 pm–4:15 pm

Examining PDMS &-; Compound Interactions as a Function of PDMS Treatments in Organ-On-Chip Systems

Dmitry Markov¹, Emily Shafer¹, and Lisa McCawley¹

¹Vanderbilt University, Nashville, TN

4:15 pm–4:30 pm

In Vitro Recapitulation of the Dysfunctional Neuromuscular Junction in Charcot-Marie-Tooth Disease

Rachel Besser¹, Renata Maciel¹, Isabella Claire¹, Ahmad Alassaf¹, Daniel Carbonero¹, Mario Saporta¹, and Ashutosh Agarwal¹

¹University of Miami, Miami, FL

4:30 pm–4:45 pm

Develop In Vitro model of Blood Vessel and its Pathological Condition for Studying Mechanobiology

Hyeonji Yu¹, Dongwon Kang¹, Minji Whang¹, and Jungwook Kim¹

¹Sogang University, MAPO, Korea, Republic of

4:45 pm–5:00 pm

Durable and Flexible Superhydrophobic and Blood-Repelling Surface with Shape-Customizable Features for Biomedical Applications

Zhe Li¹, Ba Loc Nguyen¹, Yi Chih Cheng¹, and Choon Hwai Yap¹

¹National University of Singapore, Singapore, Singapore

OP-Fri-3-5

Room A314

Track: Biomechanics, Cellular and Molecular Bioengineering

Cellular and Molecular Biomechanics: Mechanobiology II

Chairs: Mohammad Mofrad, Tae Yoon Kim

3:30 pm–3:45 pm

Differential Molecular Association to Nascent Adhesions in Force-Assisted Stabilization of Adhesion Complex

Sangyoon Han¹, Kevin Dean², Alexia Bachir³, Alan Horwitz⁴, and Gaudenz Danuser²

¹Michigan Technological University, Houghton, MI, ²University of Texas Southwestern Medical Center, Dallas, TX, ³ThermoFisher Scientific, Eugene, OR, ⁴Allen Institute for Cell Science, Seattle, WA

3:45 pm–4:00 pm

ECM Stiffness Modulates the Activation and Contractility of Primary Corneal kKeratocytes in Response to TGF-β

Daniel Maruri¹, Pouriska Kivanany², Miguel Miron Mendoza², David Schmidtke¹, Matthew Petroll², and Victor Varner¹

¹University of Texas at Dallas, Richardson, TX, ²University of Texas Southwestern Medical Center, Dallas, TX

4:00 pm–4:15 pm

The Role of Vimentin Intermediate Filaments in Mouse Embryonic Fibroblasts Mechanics

Amir Vahabikashi^{1,2}, Chan Young Park³, Huayin Wu⁴, David Weitz⁴, Jeffery Fredberg³, Robert Goldman¹, and Mark Johnson²
¹Feinberg School of Medicine, Northwestern University, Chicago, IL, ²Northwestern University, Evanston, IL, ³Harvard School of Public Health, Boston, MA, ⁴Harvard University, Boston, MA

4:15 pm–4:30 pm

Mechanotransduction Of ER Stress-Mediated Inflammation By Endothelium

Keith Bailey¹, Scott Simon¹, and Anthony Passerini¹
¹UC Davis, Davis, CA

4:30 pm–4:45 pm

Enzymatically Powered Surface-Associated Self-Motile Protocells

Woo-Sik Jang¹, Hyun Kim¹, Chen Gao¹, Daeyeon Lee¹, and Daniel A. Hammer¹
¹University of Pennsylvania, Philadelphia, PA

4:45 pm–5:00 pm

The Effect of Altered Shear Stress on the Blood-Brain Barrier in a Cerebral Bifurcation Model

Nesrine Bouhrira¹ and Peter Galie¹
¹Rowan University, Glassboro, NJ

OP-Fri-3-6

Room A315

Track: Tissue Engineering, Stem Cell Engineering

Development Biology and Stem Cells in Tissue Engineering

Chairs: Walter Murfee, Tara Deans

3:30 pm–3:45 pm

BMP Signaling Modulates Differential Growth to Control Buckling Morphogenesis of the Small Intestine

Nandan Nerurkar¹
¹Columbia University, New York, NY

3:45 pm–4:00 pm

3D Printed Collagen Tubes as Scaffolds for Engineering Functional Human Cardiac Muscle

Jacqueline Bliley¹, Andrew Lee¹, TJ Hinton¹, Andrew Hudson¹, Daniel Shiwardski¹, Joshua Tashman¹, Sai Gopal Yerneni¹, and Adam Feinberg¹
¹Carnegie Mellon University, Pittsburgh, PA

4:00 pm–4:15 pm

Directly and Indirectly Co-cultured hiPSC-Derived Pericytes Have Differential Effects on the Barrier Function of Brain Microvascular Endothelial Cells

John Jamieson¹, Raleigh Linville¹, Yuan Yuan Ding¹, Peter Searson¹, and Sharon Gerecht¹
¹Johns Hopkins University, Baltimore, MD

4:15 pm–4:30 pm

Hydrogel Encapsulation of Hepatocytes and Vascular Cells to Develop a Bioartificial Liver

Asli Unal¹, Sydney Jeffs¹, and Jennifer West¹
¹Duke University, Durham, NC

4:30 pm–4:45 pm

Real-Time Evaluation of Mesenchymal Stem Cells Chondrogenic and Osteogenic Differentiation Progression

Rodrigo Somoza¹, Jonathan Kenyon¹, Lori Duesler¹, and Arnold Caplan¹
¹Case Western Reserve University, Cleveland, OH

4:45 pm–5:00 pm

The Effect of Zinc on the Osteogenic Differentiation of Mesenchymal Stem Cells

Jennifer Moy¹, Ateka Khader¹, and Treena Livingston Arinze¹
¹New Jersey Institute of Technology, Newark, NJ

OP-Fri-3-7

Room A316

Track: Biomedical Imaging and Instrumentation, Neural Engineering

Neuroimaging, Neuromodulation and Neurosurgery

Chairs: Costas Arvanitis, Junjie Yao

3:30 pm–4:00 pm

Neurosurgery Sees the Light: From Lasers to Luminescence



Robert Gross¹
¹Emory University, Atlanta, GA

4:00 pm–4:15 pm

Targeting Ultrasonic Neuromodulation in Non-Human Primates With Optical Tracking-Guided MR-ARFI

Sumeeth Jonathan¹, Marshal Anthony Phipps¹, Vandiver L. Chaplin¹, Aparna Singh¹, Pai-Feng Yang¹, Allen T. Newton¹, John C. Gore¹, Limin Chen¹, Charles F. Caskey¹, and William Grissom¹
¹Vanderbilt University, Nashville, TN

4:15 pm–4:30 pm

A Fiberless Optical Sensor for Continuous Monitoring of Cerebral Blood Flow in Mice

Chong Huang¹, Yutong Gu², Jing Chen¹, Ahmed Bahrani¹, Elie Abu Jawdeh¹, Henrietta Bada¹, Lei Chen¹, and Guoqiang Yu¹
¹University of Kentucky, Lexington, KY, ²University of Southern California, Los Angeles, CA

4:30 pm–4:45 pm

Guiding Regenerative Medicine: Tracking Stem Cells in the Spinal Cord with Photoacoustic Imaging

Kelsey Kubelick¹, Diego Duman¹, Stanislav Emelianov¹, and Eleanor Donnelly²
¹Georgia Institute of Technology & Emory University, Atlanta, GA, ²Georgia Institute of Technology, Atlanta, GA

4:45 pm–5:00 pm

Transcranial Laser Stimulation Photobiomodulates Alpha Oscillations Measured by Scalp EEG

Hashini Wanniarachchi¹, Xinlong Wang¹, and Hanli Liu¹
¹University of Texas at Arlington, Arlington, TX

OP-Fri-3-8

Room A302

Track: Tissue Engineering

**Advanced Biomanufacturing
in Tissue Engineering**

Chairs: Leon Bellan, Adam Feinberg

**3:30 pm–3:45 pm
Engineering Scaffold Vasculature Using
Projection Micro-Stereolithography for
Meso Liver Culture**

Pierre Sphabmixay¹, Nicholas Fang¹, and Linda Griffith¹
¹Massachusetts Institute of Technology (MIT), Cambridge, MA

**3:45 pm–4:00 pm
Organ Perfusion Strategies to Reduce Toxicity
During Cryopreservation**

Ross Warner¹ and Adam Higgins¹
¹Oregon State University, Corvallis, OR

**4:00 pm–4:15 pm
Developing Vascularized Tissue Scaffolds
Through Extrusion-based 3D Printing
and Lyophilization**

Jonelle Yu¹, Burak Ozdoganlar¹, and Philip LeDuc¹
¹Carnegie Mellon University, Pittsburgh, PA

**4:15 pm–4:30 pm
Bioprintable Alginate-Gelatin Bioink for
Three-Dimensional Cell Culture:
A Tool for Cancer Research**

Salvador Flores-Torres¹, José Gil Munguia-López¹, Tao Jiang¹,
Jacqueline Kort-Mascort¹, and Joseph M. Kinsella¹
¹McGill University, Montreal, QC, Canada

**4:30 pm–4:45 pm
Using Dimensionless Numbers to Predict
Centrifugal Jet Spun Nanofiber Morphology**

Prashanth Ravishankar¹, Alex Khang¹, Melissa Laredo¹,
Ugochukwu Odega¹, and Kartik Balachandran¹
¹University of Arkansas, Fayetteville, AR

**4:45 pm–5:00 pm
Miniature High-throughput Bioreactor
Platform for Cardiac Tissue Organoid**

Jonathan Racki¹, William Gao¹, Adithya Kannan¹, Ayesha Ali¹,
Justin Suriano¹, Samuel Lieber¹, and Eun Jung Lee¹
¹New Jersey Institute of Technology, Newark, NJ

OP-Fri-3-9

Room A305

Track: Device Technologies and
Biomedical Robotics

**Diagnostic Technology for
Low-Resource Settings**

Chairs: Gerry Cote¹, Aydogan Ozcan

**3:30 pm–3:45 pm
KRAS Point Mutation Detection and Targeted
DNA Sequencing on a Mobile Phone**

Malte Kühnemund¹, Qingshan Wei², Evangelia Darai¹, Yingjie Wang³,
Ivan Hernandez-Neuta¹, Zhao Yang³, Derek Tseng³, Annika Ahlford¹,
Aydogan Ozcan³, and Mats Nilsson¹
¹Uppsala University, Uppsala, Sweden, ²North Carolina State University,
Raleigh, NC, ³University of California, Los Angeles, Los Angeles, CA

**3:45 pm–4:00 pm
Single-step Isothermal DNA Sample Preparation
with Paper-based amplification**

Sherine Cheung¹, Benjamin Wu¹, and Daniel Kamei¹
¹UCLA, Los Angeles, CA

**4:00 pm–4:15 pm
A Multiplexed HPV Diagnostic for Cervical
Cancer Screening in Low-Resource Settings**

Winnie Wong¹ and Catherine Klapperich¹
¹Boston University, Boston, MA

**4:15 pm–4:30 pm
A Method for Automating Biomarker
Preconcentration and Signal Enhancement
on Paper-based Devices**

Daniel Bradbury¹, April Pan¹, Milad Azimi¹, Cecilie Falktoft¹,
Alexia Diaz¹, Benjamin Wu¹, and Daniel Kamei¹
¹University of California Los Angeles, Los Angeles, CA

**4:30 pm–4:45 pm
Multiplexed Paper-based Vertical Flow Assay
for Point-of-Care Lyme Diagnostics using
Mobile-Phone**

Hyou-Arm Joung¹, Zachary S. Ballard^{1,2}, Alice Ma¹, Derek K. Tseng¹,
Hailemariam Teshome¹, Spencer Burakowski¹, Omai Garner¹,
Dino Di Carlo¹, and Aydogan Ozcan^{1,2}
¹University of California, Los Angeles (UCLA), Los Angeles, CA,
²California NanoSystems Institute (CNSI), Los Angeles, CA

**4:45 pm–5:00 pm
Portable Optical Diagnostic System for Malaria
Detection in Low Resource Setting**

Kristina Kaypaghian¹, Samantha McBirney¹, Dongyu Chen¹,
Alexis Scholtz², and Andrea Armani¹
¹University of Southern California, Los Angeles, CA, ²Johns Hopkins
University, Baltimore, MD

OP-Fri-3-10

Room A401

Track: Cardiovascular Engineering, Device Technologies and Biomedical Robotics

Vascular Devices and Hemodynamics

Chairs: Morten Jensen, Joao Soares

3:30 pm–3:45 pm

Stent Strut Geometry and Hemodynamics Modulate Wound Healing

Duy Nguyen¹, Alexander Smith¹, and Juan Jiménez¹
¹University of Massachusetts, Amherst, MA

3:45 pm–4:00 pm

Inhibition of FXII Prevents Thrombosis in an Ex Vivo Model of Venous Stenting

Khanh Nguyen¹, Michael Wallisch², Jennifer Johnson¹, Andras Gruber^{1,2}, and Monica Hinds¹
¹Oregon Health & Science University, Portland, OR, ²Aronora, Inc., Portland, OR

4:00 pm–4:15 pm

Mathematical Modeling and Pharmacokinetic Analysis of Local Liquid Delivery of Paclitaxel via a Perfusion Cardiac Catheter

Marzieh Atigh¹, Brandon Rittelmeyer¹, and Saami K. Yazdani¹
¹University of South Alabama, Mobile, AL

4:15 pm–4:30 pm

Novel Flat Wire Aneurysm Coils Promote Intra-saccular Clotting In Vitro with 50% Less Material

Brittany Earnest¹, Avery Evans¹, and Brian Helmke¹
¹University of Virginia, Charlottesville, VA

4:30 pm–4:45 pm

Transcatheter Heart Valve Type and Deployment Influences Neo-Sinus and Native Sinus Flow Stasis

Immanuel David Madukauwa-David¹, Vahid Sadri¹, Prem A. Midha², Vrishank Raghav³, Norihiko Kamioka⁴, Sam Cohen¹, Parmiss Khosravi¹, Cetin Canpolat¹, Rahul Sharma⁵, Vasilis Babaliaros⁴, and Ajit Yoganathan¹
¹Georgia Institute of Technology, Atlanta, GA, ²Biomedical Engineering Practice, Exponent Inc., Philadelphia, PA, ³Auburn University, Auburn, AL, ⁴Emory University, Atlanta, GA, ⁵Cedars Sinai Medical Center, Los Angeles, CA

4:45 pm–5:00 pm

Red Cell Damage in a Magnetically Levitated Shear Inducing Device

James Krisher¹ and Steven Day¹
¹Rochester Institute of Technology, Rochester, NY

OP-Fri-3-11

Room A403

Track: Cardiovascular Engineering, Tissue Engineering

Myocardial Tissue Engineering

Chairs: Karen Coulombe, Jeffrey Jacot

3:30 pm–3:45 pm

Cardiac Fibroblasts Modulate the Electromechanical Function of Engineered Human Cardiac Tissue

Cassady E Rupert¹, Tae Yun Kim², Bum-Rak Choi², and Karen LK Coulombe¹
¹Brown University, Providence, RI, ²Rhode Island Hospital, Providence, RI

3:45 pm–4:00 pm

Human Cardiomyocyte-Macrophage Microtissues for Modeling Systemic Inflammation

Renzhi Zhan¹ and Nenad Bursac¹
¹Duke University, Durham, NC

4:00 pm–4:15 pm

Optimized, Extracellular Matrix-based Bioink Enables Printing of Complex, Living, Cardiac Tissues

Wei-Han Lin¹, Molly Kupfer¹, and Brenda Ogle¹
¹University of Minnesota, Twin Cities, Minneapolis, MN

4:15 pm–4:30 pm

Selective G α_q Activation via hM3D(Gq) DREADD in Cardiac Fibroblasts Exerts Deleterious Effects on Rat Cardiomyocyte Function

Jordan Pomeroy¹, Ray Zhang², Sabrina Qi², and Nenad Bursac²
¹Duke University Health System, Durham, NC, ²Duke University, Durham, NC

4:30 pm–4:45 pm

Engineered Cardiac Pacemaker Node as a Model to Study the Native Pacemaker Tissue

Sandra Grijalva^{1,2}, Jung Hoon Sung³, Nam Kyun Kim¹, Jinmo Gu¹, Jun Li¹, Benjamin Furman¹, and Hee Cheol Cho^{1,2}
¹Emory University, Atlanta, GA, ²Georgia Institute of Technology, Atlanta, GA, ³CHA Bundang Medical Center, Seoul, Korea, Republic of

4:45 pm–5:00 pm

Quantitative Classification Of Drug-Induced Arrhythmias In Human Stem Cell-Derived Cardiomyocytes

Plansky Hoang¹, Nathaniel Huebsch², Kevin Healy³, Sabir Jacquir⁴, and Zhen Ma¹
¹Syracuse Biomaterials Institute—Syracuse University, Syracuse, NY, ²Washington University in St. Louis, St. Louis, MO, ³University of California, Berkeley, Berkeley, CA, ⁴Université de Bourgogne Franche-Comté, Dijon, France

OP-Fri-3-12

Room A404

Track: Cellular and Molecular Bioengineering

Molecular and Cellular ImmunoEngineering

Chairs: Shannon Sirk, Alice Tomei

3:30 pm–3:45 pm

An Unbiased Determination of peptide-MHC Repertoires for Improved Antigen Prediction

Garrett Rappazzo¹ and Michael Birnbaum¹

¹Massachusetts Institute of Technology, Cambridge, MA

3:45 pm–4:00 pm

Modular Assembly Of Synthetic Antibodies

Justin Modica¹ and Milan Mrksich¹

¹Northwestern University, Evanston, IL

4:00 pm–4:15 pm

Antigen-specific T-cell Biofactories for *In Vivo* Drug Synthesis

Claire Repellin¹, Puja Patel¹, Lucia Beviglia¹, Harold Javitz¹, Lidia Sambucetti¹, and Parijat Bhatnagar^{1,2}

¹SRI International, Menlo Park, CA, ²Stanford Cancer Institute, Stanford, CA

4:15 pm–4:30 pm

Adhesion Analysis for Enrichment of Tumor-infiltrating Lymphocytes for Adoptive Cell Therapy

Camila Camargo¹ and Susan Thomas¹

¹Georgia Institute of Technology, Atlanta, GA

4:30 pm–4:45 pm

Universal Chimeric Antigen Receptors for Multiplexed and Logical Control of T Cell Responses

Jang Hwan Cho¹, James Collins², and Wilson Wong¹

¹Boston University, Boston, MA, ²MIT, Cambridge, MA

OP-Fri-3-13

Room A405

Track: Nano and Micro Technologies

Structure Function Relationships in Nanomedicine

Chairs: Ning Jenny Jiang, Jordan Green

3:30 pm–3:45 pm

Renal-Clearable Catalytic Gold Nanoclusters for *In Vivo* Disease Monitoring

Ava Soleimany¹, Colleen Loynachan², Molly Stevens², and Sangeeta Bhatia¹

¹Massachusetts Institute of Technology (MIT), Cambridge, MA,

²Imperial College London, London, United Kingdom

3:45 pm–4:00 pm

Biodegradable Gold-Loaded Polymeric Micelles Using pH-Responsive Dextran

Elizabeth Higbee-Dempsey¹ and Andrew Tsourkas¹

¹University of Pennsylvania, Philadelphia, PA

4:00 pm–4:15 pm

Impact of Nanoparticle Surface on Cytoplasmic Delivery Revealed by Single Quantum

Dot Tracking

Mohammad Zahid¹, Liang Ma¹, Sung Jun Lim¹, and Andrew Smith¹

¹University of Illinois at Urbana-Champaign, Urbana, IL

4:15 pm–4:30 pm

Blunting Innate Immune Cell Sensitivity Towards Toll-like Receptor Activation Using Blank Nanoparticles

Ryan Pearson^{1,2}, Sandeep Kakade², Justin Rose², Joseph Decker², Kyle Deans², Michael Dolan², and Lonnie Shea²

¹University of Maryland, Baltimore, MD, ²University of Michigan, Ann Arbor, MI

4:30 pm–4:45 pm

Higher Molecular Weight of Poly(lactide-co-glycolide) Particles Modulate Neutrophils and Monocytes to Ameliorate of Inflammation

Eiji Saito¹, Robert Kuo¹, Ryan Pearson¹, Nishant Gohel¹,

Brandon Cheung¹, and Lonnie Shea¹

¹University of Michigan, Ann Arbor, MI

4:45 pm–5:00 pm

Targeted Rapamycin and Donor Antigen-Loaded Nanoparticle Delivery Provides Synergistic Islet Immunoprotection

Jacqueline Burke¹, Yunxiao (Sherry) Zhu¹, Sophia Li¹, Xiaomin Zhang¹, Evan Scott¹, and Guillermo Ameer¹

¹Northwestern University, Evanston, IL

OP-Fri-3-14

Room A406

Track: Nano and Micro Technologies, Neural Engineering

Micro and Nano-Technologies for Cellular Analysis and Neuroscience

Chairs: Chenzhong Li, Derfogail Delcassian

3:30 pm–3:45 pm

Stem Cell Adhesion Imaging with Photonic Resonator Outcoupler Microscopy (PROM)

Yue Zhuo¹, Ji Sun Choi¹, Thibault Marin², Hojeong Yu¹,

Brendan Harley¹, and Brian Cunningham¹

¹University of Illinois at Urbana-Champaign, Urbana, IL, ²University of Illinois Research Park, Champaign, IL

3:45 pm–4:00 pm

Highly Multiplexed Single-Cell Protein Profiling with Large-Scale Barcoded Arrays

Jun Wang¹

¹SUNY Albany, Albany, NY

4:00 pm–4:15 pm

High-throughput Encapsulation for Single Cell RNA-Sequencing Using Hydrodynamics

Hui-sung Moon¹, Kwanghui Je², Jae-Woong Min¹, Donghyun Park¹,

Kyung-Yeon Han¹, Seunggho Shin^{1,3}, Woong-Yang Park^{1,3,4},

Chang Eun Yoo¹, and Shin-Hyun Kim²

¹Samsung Medical Center, Seoul, Korea, Republic of, ²Korea Advanced Institute of Science and Technology, Daejeon, Korea, Republic of,

³Sungkyunkwan University, Seoul, Korea, Republic of, ⁴Sungkyunkwan University, Suwon, Korea, Republic of

4:15 pm–4:30 pm

Nanomagnetic Controlled Assembly by Terfenol-D Magnetostrictive Microstructures for Multiplexed Biosensors

Reem Khojah¹, Zhuyun Xiao¹, Mohanchandra K. Panduranga¹, Gregory P. Carman¹, Rob N. Candler¹, and Dino Di Carlo¹
¹University of California, Los Angeles, Los Angeles, CA

4:30 pm–4:45 pm

Novel Three-Dimensional Fuzzy Graphene (3DF-G)-Based Electrodes for Sub-Cellular Recordings

Sahil Rastogi¹, Jacqueline Bliley¹, Daniel Shiwarski¹, Raghav Garg¹, Adam Feinberg¹, and Tzahi Cohen-Karni¹
¹Carnegie Mellon University, Pittsburgh, PA

4:45 pm–5:00 pm

Microfluidic Hydrodynamic Trapping of Individual Human Induced Pluripotent Stem Cells for Neural Circuit Formation

Walter Varhue¹, Jisun Kim¹, Mike McConnell¹, and Nathan Swami¹
¹University of Virginia, Charlottesville, VA

OP-Fri-3-15

Room A407

Track: Drug Delivery & Intelligent Systems

Drug Delivery for Implants and Responsive Drug Delivery Systems

Chairs: Jennie Leach, Mary Beth Monroe

3:30 pm–4:00 pm

Musculoskeletal Tissue Regeneration via Spatiotemporally Controlled siRNA Delivery

Danielle Benoit¹
¹University of Rochester, Rochester, NY

INVITED

4:00 pm–4:15 pm

Optimization and Characterization of Glucose Responsive Insulin Delivery Systems

Lisa Volpatti^{1,2}, Morgan Matranga¹, Abel Cortinas^{1,2}, Robert Langer^{1,2}, and Daniel Anderson^{1,2}
¹Massachusetts Institute of Technology, Cambridge, MA,
²Koch Institute of Integrative Cancer Research, Cambridge, MA

4:15 pm–4:30 pm

Fluorous Phase-Directed Peptide Assembly Affords Nano-Peptisomes Capable of Ultrasound-Triggered Delivery of Biomacromolecular Cargo into Cells

Janna Sloand¹, Erik Cook¹, Tawanda Zimudzi¹, Scott Zinck¹, Juliana Simon¹, Scott Schowalter¹, and Scott Medina¹
¹The Pennsylvania State University, University Park, PA

4:30 pm–4:45 pm

Reactive Oxygen Species-Responsive Scaffold with Chemotherapeutics and Checkpoint Inhibitor for Combination Therapy

Jinqiang Wang¹, Chao Wang¹, Xudong Zhang¹, Gianpietro Dotti², and Zhen Gu¹
¹The University of North Carolina at Chapel Hill and North Carolina State University, RALEIGH, NC, ²University of North Carolina at Chapel Hill, Chapel Hill, NC

4:45 pm–5:00 pm

Niche-Responsive Peptide amphiphile Nanofibers to Treat Atherosclerosis

Erica B. Peters¹, Nick Tsihlis¹, Mark R. Karver², Liam C. Palmer³, Samuel I. Stupp³, and Melina R. Kibbe¹
¹University of North Carolina at Chapel Hill, Chapel Hill, NC,
²Simpson Querrey Institute for Biotechnology, Chicago, IL,
³Northwestern University, Evanston, IL

OP-Fri-3-16

Room A303

Track: Neural Engineering

Neural Decoding and Control

Chairs: Jana Kainerstorfer, Mark Sayles

3:30 pm–3:45 pm

Characterization of Brain Wave Dynamics in Volitional Control of Prosthetic Hand

Chaoyang Chen^{1,2}, Yu Zhang³, Guoxin Ni⁴, Samuel John¹, John Cavanaugh¹, Guanghua Xu³, and Stephanie Muh²
¹Wayne State University, Detroit, MI, ²Henry Ford Hospital, Detroit, MI,
³Xian Jiaotong University, Xian, China, People's Republic of, ⁴Fujian Medical University, Fuzhou, China, People's Republic of

3:45 pm–4:00 pm

Implementation of Artificial Neural Network to Classify Motor Imaginary Signals for Two Robotic Hands

Adam Reust¹ and Jaydip Desai¹
¹Wichita State University, Wichita, KS

4:00 pm–4:15 pm

Predictive Modeling of Graded Sensorimotor Neural Signals

Chase Haddix¹, Amir Al-Bakri¹, Dillon Huffman¹, and Sridhar Sunderam¹
¹University of Kentucky, Lexington, KY

4:15 pm–4:30 pm

Evaluating Grasping Force Representation in Motor Cortex of Intracortical BCI Users with Chronic Tetraplegia

Anisha Rastogi¹, Francis Willett², Brian Murphy^{1,3}, William Memberg¹, Carlos Vargas-Irwin⁴, Benjamin Walter^{3,5}, Jonathan Miller^{3,5,6}, Jennifer Sweet^{3,5}, Jad Saab^{4,7}, Brian Franco⁸, Jessica Kelemen⁸, Paymon Rezaii², Sergey Stavisky², Krishna Shenoy², Jaimie Henderson², Leigh Hochberg^{4,7,8,9}, Robert Kirsch^{1,3}, and Abidemi Ajiboye^{1,3}
¹Case Western Reserve University, Cleveland, OH, ²Stanford University, Stanford, CA, ³Louis Stokes Cleveland Dept. of VA Medical Ctr., Cleveland, OH, ⁴Brown University, Providence, RI, ⁵UH Cleveland Medical Ctr., Cleveland, OH, ⁶CWRU School of Medicine, Cleveland, OH, ⁷Dept. of VA Med. Ctr., Providence, RI, ⁸Massachusetts Gen. Hosp., Boston, MA, ⁹Harvard Medical School, Boston, MA

4:30 pm–4:45 pm

Identification of the Seizure Onset Zone in Drug-Resistant Epilepsy based on High Frequency Interictal EEG Activity and Machine Learning

Stefan Sumsy¹ and Sabato Santaniello¹
¹University of Connecticut, Storrs, CT

4:45 pm–5:00 pm

Empirically Constrained Null Models of Functional MRI Data

Mikhail Rubinov¹ and Catie Chang¹
¹Vanderbilt University, Nashville, TN

OP-Fri-3-17

Room A304

Track: Orthopedic and Rehabilitation Engineering

Spine and Intervertebral Disc

Chairs: Megan Killian, Robin Queen

3:30 pm–3:45 pm

Multiple Mechanical Nociceptive Sensitization Mechanisms are Present in the Degenerative IVD

Joshua Stover¹, Jared Zitnay¹, Brandon Lawrence¹, Jeffrey Weiss¹, and Robert Bowles¹

¹University of Utah, Salt Lake City, UT

3:45 pm–4:00 pm

Intervertebral Disc Repair Patch Emulates Native Biaxial Mechanics and Supports Cell-Mediated Tissue Regeneration

Ryan Borem¹, Allison Madeline¹, Ricardo Vela Jr.¹, Sanjitpal Gill², and Jeremy Mercuri¹

¹Clemson University, Clemson, SC, ²Spartanburg Regional Healthcare, Greer, SC

4:00 pm–4:15 pm

Quantifying the Effects of aRED on Astronaut Lumbar Musculature Following Long-Duration Spaceflight

Kyle McNamara^{1,2}, Katelyn Greene^{1,2}, and Ashley Weaver^{1,2}

¹Wake Forest School of Medicine, Winston-Salem, NC, ²Virginia Tech-Wake Forest University School of Biomedical Engineering and Sciences, Winston-Salem, NC

4:15 pm–4:30 pm

CRISPR Epigenome Editing of Neurons Reduces Multiple Pathways of IVD Induced Thermal Sensitization

Joshua Stover¹, Niloofar Farhang¹, Brandon Lawrence¹, and Robert Bowles¹

¹University of Utah, Salt Lake City, UT

4:30 pm–4:45 pm

Computational Analysis of Thoracolumbar Spine Fractures in Frontal Motor Vehicle Crash Reconstruction

Xin Ye¹, James Gaewsky¹, Derek Jones¹, Logan Miller¹, Joel Stitzel¹, and Ashley Weaver¹

¹Wake Forest University, Winston-Salem, NC

4:45 pm–5:00 pm

Release of Residual Strains Promotes Aberrant Phenotypes in the Annulus Fibrosus During Disc Degeneration

Edward Bonnevie^{1,2}, Sarah Gullbrand^{1,2}, Beth Ashinsky^{1,2,3}, Dawn Elliott⁴, Harvey Smith^{1,2}, and Robert Mauck^{1,2}

¹University of Pennsylvania, Philadelphia, PA, ²CMC VA Medical Center, Philadelphia, PA, ³Drexel University, Philadelphia, PA, ⁴University of Delaware, Newark, DE

OP-Fri-3-18

Room A408

Track: Stem Cell Engineering, Neural Engineering

Neural Stem/Progenitor Cell Engineering

Chairs: Ethan Lippmann, Casim Sarkar

3:30 pm–3:45 pm

Angiomotin Orchestrates Mechanosensitive Neural Stem Cell Behavior By Linking Rho and YAP Signaling

Phillip Kang¹, Sanjay Kumar^{1,2}, and David Schaffer^{1,2}

¹UC-Berkeley, Berkeley, CA, ²Lawrence Berkeley National Lab, Berkeley, CA

3:45 pm–4:00 pm

Matrix Remodeling Regulates Neural Progenitor Cell Stemness and Differentiation in 3D Hydrogels

Christopher Madl¹, Bauer LeSavage¹, Ruby Dewi¹, Cong Dinh¹, Ryan Stowers¹, Margarita Khariton¹, Kyle Lampe^{1,2}, Duong Nguyen³,

Ovijit Chaudhuri¹, Annika Enejder^{1,3}, and Sarah Heilshorn¹

¹Stanford University, Stanford, CA, ²University of Virginia, Charlottesville, VA, ³Chalmers University of Technology, Gothenburg, Sweden

4:00 pm–4:15 pm

Engineering 3-D Neural Organoid Morphology using Alginate Hydrogels

Carlos Marti-Figueroa¹, Frank Seipel¹, George Schmidt¹,

Lih-Sheng Turng¹, and Randolph Ashton¹

¹UW-Madison, Wisconsin Institute for Discovery, Madison, WI

4:15 pm–4:30 pm

Engineering Neural Tissue from Human Pluripotent Stem Cells Using Small Molecule Releasing Microspheres

Laura De la Vega¹, Karina Karmirian², and Stephanie Willerth¹

¹University of Victoria, Victoria, BC, Canada, ²Federal University of Rio de Janeiro, Rio de Janeiro, Brazil

4:30 pm–4:45 pm

Bi-Directional Crosstalk between Muscle Stem Cell and Motor Neuron Modulates Muscle Regenerative Capacity

Jeongmoon Choi¹, Eunjung Shin¹, Woojin Han¹, Hyeonsoo Jeong¹,

Shannon Anderson¹, Mahir Mohiuddin¹, Shadi Nakhai¹, Thu Tran¹,

Soojin Yi¹, Carlos Aguilar², Amy Wagers³, and Young Charles Jang¹

¹Georgia Institute of Technology, Atlanta, GA, ²University of Michigan, Ann Arbor, MI, ³Harvard University, Cambridge, MA

4:45 pm–5:00 pm

Neuroprotective Activities of Heparin, Heparinase III, and Hyaluronic Acid on the A β 42-treated Forebrain Spheroids Derived from Human Stem Cells

Julie Bejoy¹, Liqing Song², and Yan Li²

¹Florida Agricultural and Mechanical University, Tallahassee, FL, ²FamU-FSU College of Engineering, Tallahassee, FL

SPECIAL SESSIONS

3:30 pm–5:00 pm

Room A411

Physical Science Oncology Networking

Chairs: None

A Network of Physical Science Oncology Centers & Projects is being funded by the National Cancer Institute, and many faculty and students in Biomedical Engineering Departments are directors, investigators, or fellows in the Network. This symposium will describe the Center efforts while highlighting ongoing work and will breakup into small roundtable discussions to answer science questions and also describe opportunities for interactions. A reception will follow on Friday evening at the Omni Hotel at CNN Center to socialize and further network.

3:30 pm–5:00 pm

Room A409

Athanasίου Annals of Biomedical Engineering Student Award Session

Chairs: Stefan Duma

In 2017 the Kerry and Kiley Athanasίου Endowment was established within the Biomedical Engineering Society (BMES) to promote graduate students and post-doctoral scholars through their publications in the Annals of Biomedical Engineering (ABME). This session will include up to six speakers selected by the ABME Editorial Board based on their outstanding publications in ABME during the past year. Each award recipient will present a 10 minute summary of their paper followed by 5 minutes of Q&A. A plaque and award of \$500 will be presented to each winner.

3:30 pm–5:00 pm

Room A310

BMES Graduate Medical Innovation Program Workshop Part III: Defining Student Archetype(s)

Chairs: Jenny amos, Gilda Barabino

Graduate medical innovation (GMI) programs provide pathways for engineers, life scientists, and MDs to amplify each other's efforts in developing new innovations in medicine. These programs are emerging from engineering departments, but also from medical schools, business programs, and entrepreneurship centers. All of these different graduate programs have in common the need to identify high-quality students with strong potential for success. At the same time, the process of bringing new medical technologies to market requires contributions from individuals with disparate skill sets, such as engineers, researchers, clinicians, and entrepreneurs. This diverse range of skills demands a careful consideration of the student archetypes who should be included in such programs.

This workshop emerged from the second GMI Program Workshop, held at the 2017 BMES Annual Meeting; at that event, a break-out session brainstormed attributes of "ideal" candidate students for GMI programs. Following up on that workshop, the organizers distributed surveys to both administrators and alumni of GMI programs. The 2018 Workshop will include detailed review and discussion of the results of these surveys, with the goal of continuing to define the archetype(s) of prospective students with the potential for success in this style of program.



Track: Biomaterials

Advanced Characterization and Imaging of Biomaterial Environments

FR-1

Cyclic Tensile Testing of Biomaterials in Cell Culture Incubator

Soliman Alhudaithy¹, Sangamesh Kumbhar^{1,2}, and Kazunori Hoshino¹
¹University of Connecticut, Storrs, CT, ²University of Connecticut Health Center, Farmington, CT

FR-2

Effect of Obesity on Immune and Fibrotic Response to Materials used in Cell-based Therapies

Kaitlyn Sadtler^{1,2}, Corina MacIsaac¹, Francisco Zepeda¹, Joshua Doloff¹, Robert Langer^{1,2}, and Daniel Anderson^{1,2}
¹Massachusetts Institute of Technology, Cambridge, MA, ²Boston Children's Hospital, Harvard Medical School, Boston, MA

FR-3

Combined Effects of Transient Upstream Priming and Hematocrit on Downstream Platelet Rolling

Elizabeth Pumford¹, Alexandra Zudova¹, and Vladimir Hlady¹
¹University of Utah, Salt Lake City, UT

FR-4

Improving the Efficiency of Nanoindentation Modulus Measurement in Soft Materials: A Comparison of DMT- and JKR-Based Adhesion Models

Jae Lee¹ and Donna Ebenstein¹
¹Bucknell University, Lewisburg, PA

FR-5

Neural Network Utilization in Classification of Collagen Bioglass Constructs Through Raman Spectral Mapping

Trevor Schmitt¹, Brandon Schmitt^{1,2}, and Michael Fenn¹
¹Florida Institute of Technology, Melbourne, FL, ²Alidyne Corporation, San Jose, CA

FR-6

Upstream Platelet Priming Effects on Transient Downstream Platelet-Surface Interactions

Alexandra Zudova¹, Elizabeth Pumford¹, and Vladimir Hlady¹
¹University of Utah, Salt Lake City, UT

Track: Biomaterials, Nano and Micro Technologies

Advances in Biomaterials Integration with Chips and Devices

FR-7

Graphene Patterned Microchip for Colorectal Cancer Detection

Kavya Hemmanur¹, Sanjay Robin Karimbanamlayil Babu¹, Prabir Patra¹, and Isaac Macwan¹
¹University of Bridgeport, Bridgeport, CT

FR-8

Modulating Properties of Freestanding Chitosan Membranes in Microfluidics with Glutaraldehyde

Piao Hu¹, Christopher Raub¹, and Xiaolong Luo¹
¹Catholic University of America, Washington, DC

FR-9

Integration of 3D Extracellular Matrix and Flow-based Chemical Field Generation in a Microfluidic Device For Cell Migration Study

Jiandong Wu¹, Xiaoou Ren¹, Jolly Hipolito¹, and Francis Lin¹
¹University of Manitoba, Winnipeg, MB, Canada

FR-10

Nanoparticle Focusing by Coupling Thermophoresis and Engineered Vortex in Microfluidic Device

Danli Luo¹, Guanyang Xue¹, and Xuanhong Cheng¹
¹Lehigh University, Bethlehem, PA

FR-11

Ennobling Stainless Steel for Biomedical Applications

John R. Aggas^{1,2}, Ankita Bhat^{1,2}, Brandon K. Walther^{1,2,3}, and Anthony Guiseppi-Elie^{1,2}
¹Texas A&M University, College Station, TX, ²Bioelectronics, Biosensors & Biochips (C³B), College Station, TX, ³Houston Methodist Research Institute, Houston, TX

FR-12

Fractionation and Enrichment of Extracellular Vesicles via a Carbon Nanotube Microdevice

Mackenzie Maurer^{1,2}, Wen-Long Zhang^{1,2}, Yuan Wan^{1,2}, and Si-Yang Zheng^{1,2,3}
¹The Pennsylvania State University, University Park, PA, ²Penn State Materials Research Institute, University Park, PA, ³The Huck Institute of Life Sciences, The Pennsylvania State University, University Park, PA

FR-13

3D Porous Prussianblue Armored GOD and its Application in Glucose Biosensing

Cang Wang¹, Yuquan Chen¹, Xiaojun Huang¹, and Dajing Chen²
¹Zhejiang University, Hangzhou, China, People's Republic of, ²Hangzhou Normal University, Hangzhou, China, People's Republic of

FR-14

Encapsulation Properties of Hybrid Polyimide/Amorphous Silicon Carbide Thin-film Structures

Negar Geramifard¹, Jad Jabari¹, Alexandra Joshi-Imre¹, and Stuart Cogan¹
¹University of Texas at Dallas, Richardson, TX

FR-15

Attachment, Adhesion and Swelling of Hydrogels on Interdigitated Microsensor Electrode Arrays

Lauren Whitney¹, Sara Abasi¹, Ankita Bhat¹, John Aggas¹, Aaby Thyparambil¹, and Anthony Guiseppi-Elie¹
¹Texas A&M University, College Station, TX

FR-16

Development of Porous 3D In Vitro Model for Studying Transport Coupling and Tumor Metastasis

Hung-Ta Chien¹, Chun-Wei Chi¹, Sihong Wang¹, and Jing Fan¹
¹City College of New York, New York, NY

Friday, October 19 | 9:30 am–5:00 pm | GWCC Exhibit Hall

Poster Viewing with Authors & Refreshment Break | 9:30 am–10:15 am and 2:45 pm–3:30 pm

FR-17

Advanced Nanoporous Silicon Nitride Membranes (NPN-O) for Use in HemodialysisKayli Hill¹, Alec Salminen¹, JP Desormeaux², James Roussie², James McGrath¹, and Dean Johnson¹¹University of Rochester, Rochester, NY, ²SiMPore, Henrietta, NY

FR-18

Integration of 3D Skeletal Muscle with Buckled Structure for Electrical Force MeasurementYongdeok Kim¹, Xin Ning¹, Gelson Pagan-Diaz¹, Yonggang Huang², John Rogers², and Rashid Bashir¹¹University of Illinois at Urbana-Champaign, Urbana, IL, ²Northwestern University, Evanston, IL

FR-19

Sputtered Iridium Oxide Coatings For Neural Stimulation And Recording ElectrodesBitan Chakraborty¹, Alexandra Joshi-Imre¹, Jimin Maeng¹, Aswini Kanneganti¹, Bryan Black¹, Justin Abbott¹, Rashed Rihani¹, Rohit Sharma², Loren Rieth³, Sandeep Negi⁴, Joseph Pancrazio¹, and Stuart Cogan¹¹The University of Texas at Dallas, Richardson, TX, ²The University of Utah, Salt Lake City, UT, ³Feinstein Institute for Medical Research, Manhasset, NY, ⁴Blackrock Microsystems LLC, Salt Lake City, UT

FR-20

Electrically Conductive Polydopamine/polypyrrole Copolymer-coated Electrodes Efficiently Promote Electrical and Biological Interactions *In Vitro* and *In Vivo*Semin Kim¹, Lindy K Jang¹, Su A Park², and Jaeyoung Lee¹¹Gwangju Institute of Science and Technology, Gwangju, Korea, Republic of, ²Korea Institute of Machinery and Materials, Daejeon, Korea, Republic of

FR-21

Self-Assembled Peptides on Graphene: Surface and Electrical PropertiesGaurav Balakrishnan¹, Anna Kalmykov¹, Sahil Rastogi¹, Raghav Garg¹, and Tzahi Cohen-Karni¹¹Carnegie Mellon University, Pittsburgh, PA

FR-22

Integration of 3D Cell Culture into Microfluidic Devices Using Cassie-Baxter SurfacesSoroosh Torabi¹, Brad J. Berron¹, Ren Xu¹, and Christine Trinkle¹¹University of Kentucky, Lexington, KY**Track: Biomechanics****Advances in Biomechanical Testing of Medical Devices**

FR-23

Vertebral Deformation Resulting from Open Versus Central Strutted Interbody ImplantsAnna Kedzierska¹, Antonio Valdevit^{1,2}, Michelle B. Gallagher³, Jennifer M. Schneider³, and Peter F Ullrich³¹Stevens Institute of Technology, Hoboken, NJ, ²SEA Limited, Columbus, OH, ³Titan Spine, LLC, Wequon, WI

FR-24

Endplate Deformation Due to Strutted and Open Intervertebral DevicesAntonio Valdevit^{1,2}, Anna Kedzierska², Michelle B. Gallagher³, Jennifer M. Schneider³, and Peter F Ullrich³¹SEA Limited, Columbus, OH, ²Stevens Institute of Technology, Hoboken, NJ, ³Titan Spine, LLC, Wequon, WI

FR-25

A Novel Low Cost 3D Printed Digital Material Valve: To Simplify Heart Valve Modeling StudiesDorma Flemister¹ and Lakshmi Dasi¹¹The Ohio State University, Columbus, OH

FR-26

Validation of a Component-Based Coordinate System for Optical Tracking of Joint ReplacementsZachary Hargett¹, Kyle Snethen², and Melinda Harman²¹Clemson University, Simpsonville, SC, ²Clemson University, Clemson, SC

FR-27

Evaluation of the Effects of Pilot Hole Diameter on Axial Screw Pullout Strength and Torque-Derived Drilling EnergyScott Baskerville¹, Ted Conway¹, Jack Perry², Michael Karch², and Wayne Anderson²¹Florida Institute of Technology, Melbourne, FL,²Smart Medical Devices, Inc., Melbourne, FL

FR-28

Transtibial Prosthetic Socket Strength: Comparison of Standard and 3D Printing Fabrication MethodsMeredith Owen¹ and John DesJardins¹¹Clemson University, Clemson, SC

FR-29

“Immersive” Biomedical Education via Virtual Reality Leads to Enhanced Somatosensory Response and LearningMike DiCaro¹ and Marvin Slepian²¹Year, Tucson, AZ, ²Banner University Medical Center,

Tucson, Tucson, AZ

Track: Device Technologies and Biomedical Robotics**Point of Care/Mobile Devices**

FR-30

A Passive Mixing Microfluidic Urinary Albumin Chip (UAL-Chip) For Chronic Kidney Disease AssessmentJiandong Wu¹, Michael Zhang², Paul Komenda², Navdeep Tangri², Claudio Rigatto², and Francis Lin¹¹University of Manitoba, Winnipeg, MB, Canada, ²Seven Oaks General Hospital, Winnipeg, MB, Canada

FR-31

To Pee or Not to Pee: Device Development for Early Stage Chronic Kidney Disease MonitoringMelissa McCullough¹, Virginia Fonner², Michael Sweat², and Delphine Dean¹¹Clemson University, Clemson, SC, ²Medical University of South Carolina, Charleston, SC

FR-32

A Point-Of-Care Test for Serum Markers of Liver CancerShourya Kumar¹, Jacob Heggstad¹, Cassio Fontes¹, Angus Hucknall¹, Daniel Joh¹, and Ashutosh Chilkoti¹¹Duke University, Durham, NC

FR-33

Rapid Assessment of Cortisol In Non-Invasive Bio-fluids For Point-of-need ApplicationsSayali Upasham¹, Ambalika Tanak¹, Badrinath Jagannath¹, and Shalini Prasad¹¹University of Texas at Dallas, Richardson, TX

FR-34

Rapid Label-free Ultrasensitive Point-of-Care Biosensor for Early Sepsis DetectionAmbalika Tanak¹, Sriram Muthukumar², Ibrahim Hashim³, and Shalini Prasad¹¹University of Texas at Dallas, Richardson, TX, ²EnLiSense LLC, Allen, TX, ³UT southwestern, Dallas, TX

FR-35

Printing and Drying of RT-LAMP Reagents for HIV RNA Detection at the Point-of-CareLauren Jankowski¹, Taylor Moehling¹, Karin Ejendal¹, and Jacqueline Linnes¹¹Purdue University, West Lafayette, IN

FR-36

Fluidic Control with Wax Valves for Paper-based DiagnosticsEmilie Newsham¹, Elizabeth Phillips¹, Katherine Clayton¹, and Jacqueline Linnes¹¹Purdue University, West Lafayette, IN

FR-37

Reliability of Data Transmission in a Cloud-based Mobile Fitness AppJames Velasco¹, James Sunthonlap¹, and Deborah Won¹¹California State University, Los Angeles, Los Angeles, CA

FR-38

A Novel Approach for Patient-Friendly Kidney Function MonitoringRagwa Elsayed¹, Rathna Ramesh¹, David Anastasiu¹, and Alessandro Bellofiore¹¹San Jose State University, San Jose, CA

FR-39

Smartphone Detection of Malaria using Isothermal AmplificationAshlee Colbert¹, Katherine Clayton¹, Jacqueline Linnes¹, and Tamara Kinzer-Ursem¹¹Purdue University, Lafayette, IN

FR-40

Microfluidic Programmable Lab-on-Paper DevicesYashodeep Patil¹, Venumadhav Korampally¹, Theodore Shapiro¹, Dhakshenan Pushparajan¹, Diomme Griffin¹, James Horn¹, Kevin Dotseth¹, and Donald Peterson¹¹Northern Illinois University, Dekalb, IL

FR-41

Droplet Actuation on a Surface with Anisotropic Wettability Using In-plane Symmetric Cyclic VibrationLin Qi¹ and Yi Zhao¹¹The Ohio State University, Columbus, OH

FR-42

Biotinylated BSA Detection using a Portable Optical Cavity BiosensorCody Joy¹, DongGee Rho¹, and Seunghyun Kim¹¹Baylor University, Waco, TX

FR-43

Report of a Split-ring Sensor Array for Solution IdentificationWenyuan Shi¹ and J-C Chiao¹¹University of Texas at Arlington, Arlington, TX

FR-44

At-Home Automated Device for Therapeutic Monitoring of TacrolimusJung Min Lee¹, Burton Ye¹, Gabriel Fernandes¹, Elizabeth Wu¹, Brett Wolfinger¹, Douglas Mogul^{2,3}, and Amir Manbachi¹¹Johns Hopkins University, Baltimore, MD, ²Comprehensive Transplant Center, Baltimore, MD, ³Johns Hopkins School of Medicine, Baltimore, MD

FR-45

Design and Evaluation of a Hand-held, Automated Venipuncture Device Employing a Force Sensing/Puncture Detection System.Josh Leipheimer¹, Max Balter¹, Alvin Chen¹, Tim Maguire¹, and Martin Yarmush¹¹Rutgers University, Piscataway, NJ

FR-46

DNA Microarray Analysis Using Smartphone to Detect BRCA-1 GeneAlisha Prasad¹ and Manas R Gartia¹¹Louisiana State University, Baton Rouge, LA

FR-47

Interfacial Effect-based Real-time Quantification of Droplet Isothermal Nucleic Acid AmplificationTiffany-Heather Ulep¹, Alexander Day¹, Katelyn Sosnowski¹, Alexa Shumaker¹, and Jeong-Yeol Yoon¹¹University of Arizona, Tucson, AZ

FR-48

Encoding Cell-Free Synthetic Circuits on Microparticles to Build Biorobots for Medical DiagnosisTing-Yen Wei¹ and Warren Ruder¹¹University of Pittsburgh, Pittsburgh, PA**Track: Device Technologies and Biomedical Robotics****Affordable Health Devices and Frugal Innovation**

FR-49

Design and Fabrication of an Indigenous Baby Incubator for Neonates in NigeriaMynepalli Sridhar¹, Akinwale Coker¹, Idowu Ayede¹, and Hamed Taiwo¹¹University of Ibadan, Ibadan, Nigeria

FR-50

An Affordable Pharyngeal Vibration Device to Assist Speech Generation for Laryngectomy Patients

Ricky Hu¹, Prateek Mathur¹, Pardiss Danaei¹, Justin Wyss¹, Houssam El-Hariri¹, Harman Parhar², and Donald Anderson¹
¹University of British Columbia, Vancouver, BC, Canada, ²University of British Columbia, Vancouver, Canada

FR-51

Reusable Intrauterine Tamponade for Managing Postpartum Hemorrhage in Low-Resource Settings

Katherine Hu¹, Maya Lapinski¹, Gavin Mischler¹, Joshua Punnoose¹, Larissa Chan¹, Alicia Coronado¹, Michael Koo¹, Ryan Najmi¹, Robert Allen¹, Rachel Seay², and Amir Manbachi¹
¹Johns Hopkins University, Baltimore, MD, ²Johns Hopkins University School of Medicine, Baltimore, MD

FR-52

Kifua Pampu: A Robust Breast-Pump for the Prevention of Mother to Child Transmission of HIV

Maggie Elpers¹, Alex Harrison¹, Maren Downing¹, O. Thompson Meford¹, Melissa McCullough¹, John DesJardins¹, William Richardson¹, and Delphine Dean¹
¹Clemson University, Clemson, SC

FR-53

Development of Mobility Device for the Visually Impaired in Developing Countries

Jessie Boulos¹, Elizabeth Gaston¹, Megan Grahne², Helen Nguyen¹, Melissa McCullough¹, William Richardson¹, John DesJardins¹, and Delphine Dean¹
¹Clemson University, Clemson, SC, ²Clemson University, Clemson, SC

FR-54

Low Cost Neonatal Infant Insulating and Monitoring System for Remote Rural Areas

Benjamin Banaszak¹, Michaela Cattell¹, Jennifer Hadley¹, Rachel Moen¹, Zachary Hargett¹, Melissa McCullough¹, William Richardson¹, John DesJardins¹, and Delphine Dean¹
¹Clemson University, Clemson, SC

FR-55

HojaHealth: Portable Patient Monitoring

Nathan Guion¹, Ian DeMass¹, Ryan Gilbert¹, Carson Brewer¹, Kaleb Guion¹, John DesJardins¹, and Delphine Dean¹
¹Clemson University, Clemson, SC

FR-56

Medical Device Reuse Practices and Reprocessing Methods in Hospitals within a Low-Resource Setting

Sarah Zemitis¹, Zachary Hargett¹, Delphine Dean¹, Donna Weinbrenner¹, and Melinda Harman¹
¹Clemson University, Clemson, SC

FR-57

Development of a Low-Cost Humidity Control System to Protect Microscopes in a Tropical Climate

Anders Asp¹, Sara Aristizabal¹, Ephraim Ben-Abraham², Maria Gonzalez Porras¹, Manuela Lopera Higuaita¹, Gabriel Martínez-Gálvez¹, Victoria Marks¹, Evan Nicolai¹, Christina Webber¹, John Wilson³, and J. Luis Lujan⁴
¹Mayo Clinic Graduate School of Biomedical Sciences, Rochester, MN, ²Mayo Clinic Dept. of Surgery, Rochester, MN, ³Mayo Clinic Internal Medicine, Rochester, MN, ⁴Mayo Clinic Neurologic Surgery, Rochester, MN

FR-58

ShapeCam: Robust Extraction of PPG Shape using a Camera

Akash Maity¹, Ashok Veeraraghavan¹, and Ashutosh Sabharwal¹
¹Rice University, Houston, TX

FR-59

Non-invasive Tear Glucose Self-monitoring Device Enabled with Concurrent Tear Collection and Glucose Measurement

Yong Chan Cho¹, Seung Ho Lee¹, and Young Bin Choy¹
¹Seoul National University, Seoul, Korea, Republic of

FR-60

3D-Printed Microfluidic Detection Modules for Quantification of the Albumin-to-Creatinine Ratio

Alyse Krausz¹ and Mark Burns¹
¹University of Michigan, Ann Arbor, MI

Track: Device Technologies and Biomedical Robotics

Assistive Technology

FR-61

Novel Speech Solution for Individuals with Tracheal Damage

Bryce Hina¹, Hunter McMahan¹, Paul Jackemeyer¹, and Melanie G Watson¹
¹Trine University, Angola, IN

FR-62

An Human-Computer Interaction Device In Mobile Health Application Using EOG signal

Lawrence Lam¹, T. Hsich¹, P Ho¹, R Tanzil¹, and P Huynh¹
¹University of Washington Bothell, Bothell, WA

**Track: Device Technologies
and Biomedical Robotics**

Wearable Sensors and Devices

FR-63

Dynamic Pressure Sensing Shoe Accessory

Sarah McKain¹, Peyton Sharp¹, Melissa McCullough¹, and Delphine Dean¹

¹Clemson University, Clemson, SC

FR-64

Classification of Individual Finger Movements Using a Myoelectric Armband and Machine Learning Techniques

David McLeod¹, Brian Dean¹, and Delphine Dean¹

¹Clemson University, Clemson, SC

FR-65

Wearable Non-invasive Biosensor for Lactate Monitoring in Passively Addressable Sweat

Ashlesha Bhide¹, Sriram Muthukumar², and Shalini Prasad¹

¹University of Texas at Dallas, Richardson, TX, ²Enlisen LLC, Allen, TX

FR-66

Combined Near Infrared Spectroscopy and Pulse-Echo Ultrasound for Non-invasive Glucose Detection

Ye Zhan¹, Souransu Nandi¹, Lucy Mastrandrea¹, Tarunraj Singh¹, and Jun Xia¹

¹University at Buffalo, Buffalo, NY

FR-68

Wearable Smartphone-Controlled Stimulator System for Veterinary Electro-Acupuncture

Jose Aquiles Parodi Amaya¹, Tallis Huther da Costa¹, Ronald Koh¹, and Jin-Woo Choi¹

¹Louisiana State University, Baton Rouge, LA

FR-69

Wireless Flexible Hybrid Electronics for a Persistent Brain-Machine Interface

Musa Mahmood¹, Deogratias Mzurikwao², Yun-Soung Kim¹, Yongkuk Lee¹, Chee Siang Ang², and Woon-Hong Yeo¹

¹Georgia Tech, Atlanta, GA, ²University of Kent, Kent, United Kingdom

FR-70

Using EOG As A Control Signal in IoT Applications

Lawrence Lam¹, R Li¹, L Engelhardt¹, C Hong¹, and K Xu¹

¹University of Washington Bothell, Bothell, WA

FR-71

Wearable Aldehyde Sensor for Pediatric Asthma Research

Baichen Li¹, Quan Dong¹, Scott Downen¹, Nam Tran¹, and Zhenyu Li¹

¹The George Washington University, Washington, DC, DC

FR-72

Using a Wearable Multiple-Lead ECG Sensor to Detect Sudden Cardiac Events

Quan Dong¹, Baichen Li¹, Richard Downen¹, and Zhenyu Li¹

¹George Washington University, Washington, DC

FR-73

Wearable Sensor Network for Comprehensive Human Motion Quantification and Feedback

Kaitlyn Ammann¹, Jacob Garland¹, and Marvin Slepian¹

¹University of Arizona, Tucson, AZ

FR-74

Stretchable Wireless Skin-Adherent Patches for Human Motion Envelope Quantification

Kaitlyn Ammann¹, Alice Sweedo¹, Rebecca Slepian¹, and Marvin Slepian¹

¹University of Arizona, Tucson, AZ

FR-75

Multimodal Psychophysiological Monitoring for Workload Classification

Grace Wusk¹ and Hampton Gabler¹

¹Virginia Tech, Blacksburg, VA

FR-76

Digital Reflex Definition and Quantitation of Superficial Reflexes Using Wearable Stretchable Electronic Wearable Sensors

Rebecca Slepian¹, Hailey Swanson¹, Alyssa Thompson¹, Kaitlyn Ammann¹, Alice Sweedo¹, Ryan Walk¹, Bruce Coull¹, and Marvin Slepian¹

¹University of Arizona, Tucson, AZ

FR-77

Tongue Position Tracking Device (TPTD): A Discreet Wireless Electropalatography and Glossometry Device

Greta Pastore¹ and Hananeh Esmailbeigi¹

¹University of Illinois at Chicago, Chicago, IL

FR-78

Electromagnetic Skin Patch Sensor for the Detection of Cerebrospinal Fluid Volume Changes in the Cerebral Ventricles of a Hydrocephalic Head Phantom

Subash Bhandari¹, Jacob Griffith¹, Faye Alruwaili¹, Ryan Becker¹, Bernardo Villafana-Ibarra¹, and Kim Cluff¹

¹Wichita State University, wichita, KS

FR-79

Frequency Therapy Distribution by Means of Mass Production

Jonathan Moreno¹, Kelsey Catania¹, and George Pappas¹

¹Lawrence Technological University, Southfield, MI

FR-80

Signal Source Selection for Continuous Classification of Complex Anticipated Locomotor Transitions

Mahdieh Kazemimoghdam¹ and Nicholas Fey^{1,2}

¹The University of Texas at Dallas, Richardson, TX, ²UT Southwestern Medical Center, Dallas, TX

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FR-81

Characterization of a Stretchable Conductive Polymer for Wearable TechnologyJordan Helledy¹, Eric Garcia-Mejia¹, Juan Pacheco-Garcia¹, and Alessandro Bellofiore¹
¹San Jose State University, San Jose, CA

FR-82

Reducing the Occurrence of Foot Ulcers In Diabetic Patients with Electro-Tactile FeedbackAmy Lloyd¹
¹Mercer University, Macon, GA

FR-83

TinyOx-A Wearable Muscle Oximeter for the ObeseAndres Julian Rodriguez¹, Nicole Sevilla¹, Nidhi Suthar¹, Jean Marc Augustin¹, Daniel Wilding¹, Tananant Boonya-ananta¹, and Jessica Ramella-Roman¹
¹Florida International University, Miami, FL

FR-84

Passively Addressable Sensor for Monitoring Chloride Ion Levels in SweatAntra Ganguly¹ and Shalini Prasad¹
¹UT Dallas, Richardson, TX

FR-85

PIsens: Pedal Iontronic Sensing as a Novel Wearable Healthcare InterfaceZhichao Zhang¹, Zijie Zhu¹, and Tingrui Pan¹
¹University of California Davis, DAVIS, CA

FR-86

Clinical Validation of a Wristband Activity Tracker's Sleep FeatureErik Zavrel¹ and Ana Krieger²
¹Cornell University, Ithaca, NY, ²Weill Cornell Medicine, New York, NY**Track: Device Technologies and Biomedical Robotics, Translational Biomedical Engineering****Translation of Devices from the Lab to the Clinic/Market**

FR-87

Design of a Nerve Block Insertion DeviceAaron Van Gorkom¹, Philip Brown¹, James Turner², and Sean Dobson²
¹Biomedical Engineering, Wake Forest Baptist Health, Winston-Salem, NC, ²Wake Forest Baptist Medical Center, Winston-Salem, NC

FR-88

Clinical Trial Evaluation of a New Feeding Design Mechanism for Children Born with Cleft PalateThanh Tran¹, Kathleen Borowitz¹, Lawson Jenkins¹, and Silvia Blemker¹
¹University of Virginia, Charlottesville, VA

FR-89

Surgical Detector for the Localization of Implanted Breast Tissue MarkersScott Slaney¹, Mackenna Judge¹, Nancy Demore², and Delphine Dean¹
¹Clemson University, Clemson, SC, ²Medical University of South Carolina, Charleston, SC**Track: Device Technologies and Biomedical Robotics, Translational Biomedical Engineering****Interventional Devices and Robotics**

FR-93

Design and Validation of a Novel Expandable Brain Retractor for Accessing Deep-Seated LesionsRohith Bhethanabotla¹, Callie Deng¹, Linh Tran¹, Sun Jay Yoo¹, Jody Mou¹, Jack Ye¹, Munachiso Igboko¹, Kevin Tu¹, Christine Diaz¹, Rajiv Iyer², Alan Cohen², and Amir Manbachi¹
¹Johns Hopkins University, Whiting School of Engineering, Baltimore, MD, ²Johns Hopkins University School of Medicine, Baltimore, MD

FR-94

Optimizing PEG "Feeding Tube" Intervention for ALS using Predictive MedicineLeila Bond¹, Paulamy Ganguly¹, Nishad Khamankar¹, Nolan Mallet¹, and Cassie Mitchell²
¹Georgia Institute of Technology, Atlanta, GA, ²Georgia Institute of Technology & Emory University, Atlanta, GA

FR-95

Cooling System for the Reduction of Hair Follicle Damage during ChemotherapyAlex Werner¹, Eric Cardiel¹, and Alessandro Bellofiore¹
¹San Jose State University, San Jose, CA

FR-96

Novel Harness for Comfortable Treatment of Pediatric Hip DysplasiaElizabeth Gonzales¹
¹Stevens Institute of Technology, Brick, NJ

FR-97

Anionic Chemotherapy Filter for Drug Specific Removal of Positively Charged Doxorubicin: Pharmacokinetic EvaluationColin Yee¹, Jay Yu¹, Aaron Losey, MD¹, Caroline Jordan¹, Teri Moore¹, Mark Wilson¹, and Steven Hetts¹
¹University of California, San Francisco, San Francisco, CA

FR-98

Development of a Portable Suction System, and Characterization of the Suction Catheters for the Military, and Civilian EmergenciesForhad Akhter¹, Austin Schoppe¹, Omar Navarro¹, Christopher Carroll¹, Bruce Adams², Yusheng Feng¹, Robert DeLorenzo², and Lyle Hood¹
¹University of Texas at San Antonio, San Antonio, TX, ²University of Texas Health Science Center at San Antonio, San Antonio, TX

FR-99

Comparison of Flow Dynamics between a Novel Drainage Catheter and Standard Catheter TypesBradley Feiger¹, Muath Bishawi¹, Paul Suhocki¹, Theodore Pappas¹, George Truskey¹, and Amanda Randles¹
¹Duke University, Durham, NC

FR-100

Left Atrial Appendage (LAA) Device as a Non-Valvular Atrial Fibrillation (NVAf) Therapy

Guruprasad Giridharan¹, Michael Sobieski¹, Gretel Monreal¹, Landon Tompkins¹, Todd Adams¹, Erin Schumer¹, William Whited¹, Michele Gallo¹, Mickey Ising¹, Jorge Jimenez², Steven Koenig¹, and Mark Slaughter¹

¹University of Louisville, Louisville, KY, ²Georgia Institute of Technology, Atlanta, GA

FR-101

Understanding Emotional Expression with a Humanoid Robot: A Pilot Study

Hifza Javed¹ and Chung Hyuk Park¹

¹George Washington University, Washington, DC

FR-102

Patient-Specific Biventricular Finite Element-Based Analysis of the Mardil Medical VenTouch Device

Yue Zhang^{1,2}, Mike Burger³, Vicky Wang^{1,2}, Mehrzad Tartibi^{1,2}, Jiwon Kim⁴, Julius Guccione^{1,2}, Liang Ge^{1,2}, Jonathan Weinsaft⁴, and Mark Ratcliffe^{1,2}

¹UCSF, San Francisco, CA, ²San Francisco VA Medical Center, San Francisco, CA, ³LSTC, Livermore, CA, ⁴Weill Cornell Medical College, New York, NY

Track: Device Technologies and Biomedical Robotics

Device Technologies and Biomedical Robotics—Other/Non-specified

FR-103

Fabrication of a Novel 384PillarPlate for Miniaturized 3D Bioprinting

Parnian Bigdelou¹, Stephen Hong¹, Taban Larimian¹, Mujeeb Wafa¹, Tushar Borkar¹, and Moo-Yeal Lee¹

¹Cleveland State University, Cleveland, OH

FR-104

Toward Tuning Blast Parameters in a Blast Simulator for Improved Injury Research Capability

Justin Syers¹ and Teresa Ryan¹

¹East Carolina University, Greenville, NC

FR-105

Examining the Use of Leap Motion Sensor for Measuring Finger Palpation Skill

Zhanhe Liu¹, Jared Wells¹, Deepak Vadivalagan¹, and Ravikiran Singapogu¹

¹Clemson University, Clemson, SC

FR-106

Motion-based Quantification of Hemodialysis Cannulation Skill: A Feasibility Study

Ziyang Zhang¹, Mary Stoddard¹, and Ravikiran Singapogu¹

¹Clemson University, Clemson, SC

FR-107

Surgical Screwdriver for Real-Time Insertion Torque and Energy Measurements

Andrea Rich¹ and Philip Brown¹

¹VT-WFU School of Biomedical Engineering and Sciences, Winston Salem, NC

FR-108

Robot Assisted Method for Improved Biomechanics Evaluation

Scotty Chung¹ and Philip Brown¹

¹VT-WFU School of Biomedical Engineering and Sciences, Winston-Salem, NC

FR-109

Development of Wheel-Lift: Patient Assist Device

Shashank Gupta¹, Kaiter Wu¹, Arun Nallainathan¹, Ayman Haider¹, Jueseung Baek¹, Helmut Strey¹, and Annie Rohan²

¹Stony Brook University, Stony Brook, NY, ²Stony Brook School of Nursing, Stony Brook, NY

FR-110

Instrumented Microfluidic Organotypic Device (iMOD) for the Analysis of Intestinal Tissue Ex Vivo

Alec Richardson¹, Ian McLean¹, Stuart Tobet¹, and Chuck Henry¹

¹Colorado State University, Fort Collins, CO

FR-111

New Method for Real-time Navigation and Confirmation of Nasogastric/Orogastric Tube Placement

Mallory A. Taylor¹, Bristin A. Rustenbeck¹, Michael G. Deprest¹, Jackson D. Buenger¹, Brian M. Prince¹, Anand V. Ganapathy^{2,3}, Mathews M. John², and Mehdi Razavi^{2,3}

¹Texas A&M University, College Station, TX, ²Texas Heart Institute, Houston, TX, ³Baylor College of Medicine, Houston, TX

FR-112

Low-Level Light Therapy for Improvement of Diabetic Foot Ulcer Infection Outcomes

Candace Grisham¹, Shashank Manjunath², Benjamin Perlin², Anthony Russo², Nicholas Wigginton², and Matthew Walker III²

¹Vanderbilt University, Arlingtn, TN, ²Vanderbilt University, Nashville, TN

Track: Translational Biomedical Engineering

Translational Biomedical Engineering—Other/Non-specified

FR-113

Brain-Heart Biomarker for SUDEP Susceptibility

Timothy Hutson¹, Farnaz Rezaei¹, Miranda McMickens¹, Vikas Mishra², Nicole Gautier², Edward Glasscock², and Leonidas Iasemidis¹

¹Louisiana Tech University, Ruston, LA, ²Louisiana State University Health Sciences Center Shreveport, Shreveport, LA

FR-114

Intelligent Mortality Reporting and Decision Support with FHIR

Ryan Hoffman¹, Hang Wu¹, Janani Venugopalan¹, and May Wang¹

¹Georgia Institute of Technology, Atlanta, GA

FR-115

Three “D” Visualization and Printing to Improve Surgical Outcomes in Rib Fixation Patients

John Yost¹, Evert Eriksson¹, William Devoe¹, and Michael Yost¹

¹Medical University of South Carolina, Charleston, SC

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Track: Biomaterials

3D Printing and Advanced Biomaterial Manufacturing

FR-116

Optimizing 3D Printability in Hydrogel Bioinks Through Compositional and Rheological AnalysisLogan Miller¹, David Chimene¹, and Akhilesh Gaharwar¹
¹Texas A&M University, College Station, TX

FR-117

Next-Generation Hyaluronic Acid-Based Bioinks for Cell-Friendly 3D PrintingMadison Godesky¹ and David Shreiber¹
¹Rutgers, The State University of New Jersey, Piscataway, NJ

FR-118

High Resolution 3D Printing of Cellulose Acetate Tissue ScaffoldsHanxiao Huang¹, Sonia D'Souza¹, Elijah Nyairo¹, Mohamed Abdalla², and Derrick Dean¹
¹Alabama State University, Montgomery, AL, ²Tuskegee University, Tuskegee, AL

FR-119

Microwave Sintering of Zirconia Dental MaterialsSubrata Saha¹ and Ajay Kashi²
¹Florida International University, Miami, FL, ²Private Practice, Rochester, NY

FR-120

DMD Printed Scaffold for Vascularized TissueRoya Samanipour^{1,2}, Hojatollah Rezaei Nejad³, Ali Khademhosseini⁴, Su Ryon Shin², and Mina Hoorfar¹
¹University of British Columbia, Kelowna, BC, Canada, ²Harvard Medical School, Cambridge, MA, ³Tufts University, Boston, MA, ⁴UCLA, Los Angeles, CA

FR-121

Laser Sintered Sacrificial Carbohydrate Templates for Perfusion of Dendritic Vascular NetworksIan Kinstlinger¹, Jessica Rosenkrantz², Jesse Louis-Rosenberg², and Jordan Miller¹
¹Rice University, Houston, TX, ²Nervous System, Somerville, MA

FR-122

Production of a Custom Middle Ear Prosthesis using Bone CementBrandon Kamrava¹, Steven Zuniga², Jonathan Gerstenhaber¹, Yah-el Har-el¹, and Pamela Roehm²
¹Temple University, Philadelphia, PA, ²Temple Head & Neck Institute, Philadelphia, PA

FR-123

High-Performance Bioprinting Strategies of Tunable and Photocrosslinkable SIS-dECM Bioinks by *In Silico* and Experimental Evaluation of Key Extrusion ParametersJulián A. Serna¹, Vivian A. Talero¹, Sergio L. Florez¹, Juan C. Briceño¹, Juan C. Cruz¹, and Carolina Muñoz-Camargo¹
¹Universidad de Los Andes, Bogota, Colombia

FR-124

Shear-Thinning Biodegradable Hydrogel with High Elasticity for 3D BioprintingCancan Xu^{1,2}, Wenhan Lee³, Guohao Dai³, and Yi Hong^{1,2}
¹University of Texas at Arlington, Arlington, TX, ²the University of Texas Southwestern Medical Center at Dallas, Dallas, TX, ³Northeastern University, Boston, MA

FR-125

Cell-Friendly and Scalable Culture System for Biomanufacturing Primary Human Glioblastoma Tumor-Initiating CellsQiang Li¹, Haishuang Lin¹, Ou Wang¹, and Yuguo Lei¹
¹University of Nebraska-Lincoln, Lincoln, NE

FR-126

Fabrication and Mechanical Characterization of 3D Printed Multilayered Heterogeneous ScaffoldsSean Bittner¹, Brandon Smith¹, Luis Diaz-Gomez¹, Anthony Melchiorri², John Fisher³, and Antonios Mikos^{1,2}
¹Rice University, Houston, TX, ²Center for Engineering Complex Tissues, Houston, TX, ³University of Maryland, College Park, MD

FR-127

A Method for Near-Field Electrospinning of Polydioxanone FibersWilliam King III^{1,2} and Gary Bowlin¹
¹University of Memphis, Memphis, TN, ²University of Tennessee Health Science Center, Memphis, TN

FR-128

3D Printing of Dermal and Hypodermal ECM ScaffoldsJavier Navarro^{1,2}, Morgan Janes^{1,2}, and John Fisher^{1,2}
¹University of Maryland, College Park, MD, ²Center for Engineering Complex Tissues, College Park, MD

FR-129

Hydrophobic Coatings Increase the Contact Angle and Improve the Printability of Collagen BioinksLouis Wang¹, Nicole Diamantides¹, and Lawrence Bonassar¹
¹Cornell University, Ithaca, NY

FR-130

Tissue-specific MSC-laden Biocomposites for Repair and Regeneration of Load Bearing Bone DefectsSwati Midha¹, Amtoj Kaur¹, Krishan Gopal Jain¹, Neha Kaushik², and Sujata Mohanty¹
¹All India Institute of Medical Sciences, New Delhi, India, ²All India Institute of Medical Sciences, New Delhi, India

FR-131

Development of a Biodegradable Photoresist for 3D MicroprintingKatherine Jones¹, Marco Santoro¹, and John Fisher¹
¹University of Maryland, college park, MD

FR-132

Bio-printed Hydrogel Microbeads for Culturing and Analysis of Microbial CommunitiesYunzi Li¹, Amber Webb^{1,2}, Jennifer Morrell-Falvey^{1,2}, Mitchel Doktycz¹, and Scott Retterer¹
¹Oak Ridge National Laboratory, Oak Ridge, TN, ²University of Tennessee, Knoxville, TN

FR-133

3D Printing Anisotropic Networks of Type I CollagenBryan Nerger¹, Pierre-Thomas Brun¹, and Celeste Nelson¹
¹Princeton University, Princeton, NJ

FR-134

Development of Electrospinning as Rapid Prototyping Platform for Biocompatible MaterialsRuhit Sinha¹ and Anamika Prasad¹
¹South Dakota State University, Brookings, SD

FR-135

Coding Cell Micropatterns through Peptide Inkjet Printing for Arbitrary Biomaterialized ArchitecturesWenyi Li¹, Jin Guo¹, Shengjie Ling², Ying Chen¹, Chunmei Li¹, Fiorenzoomenetto¹, and David Kaplan¹
¹Tufts University, Medford, MA, ²Shanghai Tech University, Shanghai, China, People's Republic of**Track: Biomaterials****Biomaterials for Regenerative Medicine**

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Probing the Endothelium-protective Function of Sphingosine-1-phosphate Bound in Engineered High-density Lipoprotein-mimetic NanoparticlesHyun-Ji Park¹, Yoshitaka Sei¹, Jiwon Yom¹, and YongTae Kim¹
¹Georgia Institute of Technology, Atlanta, GA

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T Cells are Involved in Foreign Body Response to Synthetic MaterialsLiam Chung¹, David Maestas¹, Andriana Lebid¹, Drew Pardoll¹, and Jennifer Elisseeff¹
¹Johns Hopkins University, Baltimore, MD

FR-138

Fiber-Embedded Scaffolds for Tricuspid Heart Valve Tissue EngineeringAlison Jacob¹, Ayasha Khanam², and Howard Matthew¹
¹Wayne State University, Detroit, MI, ²University of Michigan, Ann Arbor, MI

FR-139

Adhesive and Conductive Cardiac Patches for Cardiac Tissue Regeneration Following Myocardial InfarctionBrian Walker¹
¹Northeastern University, Boston, MA

FR-140

Freeze-Dried Biphasic Polycaprolactone and Hyaluronic Acid Scaffolds for Improved Cell InfiltrationOmar Wyman¹ and Michael Detamore¹
¹University of Oklahoma, Norman, OK

FR-141

Cell Shape: "Hidden" Factor at the Nanobio InterfacesMorteza Mahmoudi¹ and Saeid Zanganeh²
¹Harvard Medical School, Boston, MA, ²Sloan Kettering Institute for Cancer Research, New York, NY

FR-142

Investigation of the Effects of Hydroxyapatite Coating and Pore Size of 3D Printed Poly(lactic Acid)Weitong Chen¹, Julie Wyse¹, Frank Brinkley¹, Matthew Priddy¹, and Lauren Priddy¹
¹Mississippi State University, Starkville, MS

FR-143

Enzymatically Degradable Alginate Hydrogels to Deliver Cells For Revascularization ApplicationsKevin Campbell¹, Roberta Stilhano², and Eduardo Silva¹
¹University of California, Davis, Davis, CA, ²University of Sao Paulo, Sao Paulo, Brazil

FR-144

Attaching a Hydroxyapatite-binding Domain to Anchor BMP2-derived Peptides onto Bone Graft MaterialsAndrew Curry¹, Nicholas Pensa¹, Jennifer Bain², Michael Reddy¹, and Susan Bellis¹
¹University of Alabama at Birmingham, Birmingham, AL, ²University of Mississippi Medical Center, Jackson, MS

FR-145

Design and Characterization of Silk Functionalized Biomaterial for Bone RegenerationZaira Martin Moldes^{1,2}, Robyn Plowright³, Jingjie Yeo^{1,2}, Davoud Ebrahimi², Carole Perry³, Markus J. Buehler², and David L. Kaplan¹
¹Tufts University, Medford, MA, ²Massachusetts Institute of Technology, Cambridge, MA, ³Nottingham Trent University, Nottingham, United Kingdom

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Injectable Polymer System Self-Crosslinked by Catalyst-Free Click Chemistry for Bone RegenerationXifeng Liu¹, A. Lee Miller II¹, and Lichun Lu¹
¹Mayo Clinic, Rochester, MN

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Dynamic Tailorable Hydrogel Scaffolds for Tissue Regeneration ApplicationsRachel Hegab¹, Haley Barnett¹, Jamie Newman¹, and Mary Caldorera-Moore¹
¹Louisiana Tech University, Ruston, LA

FR-148

Optimization of Microwave-Assisted Drying and Storage of Trehalose Buffer Solutions as a Step towards Long-term Storage of Dried Germinal Vesicles for Fertility PreservationShangping Wang¹, Pierre Comizzoli², and Gloria Elliott¹
¹University of North Carolina at Charlotte, Charlotte, NC, ²Smithsonian Conservation Biology Institute, Washington, DC

FR-149

Tunable Mechanical Properties of Magnetically Templated Hydrogels for Peripheral Nerve RepairMary M. Kasper¹, Christopher S. Lacko¹, Ishita Singh¹, Monica A. Wall¹, Carlos Rinaldi¹, and Christine E. Schmidt¹
¹University of Florida, Gainesville, FL

Friday, October 19 | 9:30 am–5:00 pm | GWCC Exhibit Hall

Poster Viewing with Authors & Refreshment Break | 9:30 am–10:15 am and 2:45 pm–3:30 pm

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Reduction of Biomineralization on Magnesium Implant using Matrix GLA Protein

Dandan Hong¹, Samer Zaky¹, Rong Chong¹, Konstantinos Verdelis¹, Frank Witte², and Charles Sfeir^{1,3}
¹University of Pittsburgh, Pittsburgh, PA, ²Charité–Universitätsmedizin, Berlin, Germany, ³University of Pittsburgh, Pittsburgh, PA

FR-151

Synthesis and Fabrication of an Injectable Hydrogel for the Treatment of Diabetic Foot Ulcers

Duong Le¹, Phong Tran¹, Aneetta Kuriakose¹, Tram Vo¹, Rachel Nguyen², Dingying Shan³, Jian Yang³, and Kytai Nguyen¹
¹University of Texas at Arlington, Arlington, TX, ²University of Texas at Dallas, Richardson, TX, ³Pennsylvania State University, University Park, PA

FR-152

Chemically Modified Alginate Microspheres for Vascularizing Engineered Tissues

Fabiola Munarin¹, Carly Kabelac¹, and Kareen LK Coulombe¹
¹Brown University, Providence, RI

FR-153

Development of Bioactive Factors-laden Biodegradable Composite Hydrogels to Promote Wound Healing

Victoria Sears¹ and Gargi Ghosh¹
¹University of Michigan, Dearborn, Dearborn, MI

FR-154

Substrate Stiffness Affects Extracellular Matrix-Induced Cell Cycle in Cardiac Cells and Explants

Xinming Wang¹, Ryan Hansen¹, Akinola Akinbote¹, John Bradford¹, Elizabeth Schubert¹, and Samuel Senyo¹
¹Case Western Reserve University, Cleveland, OH

FR-155

Biofabrication of 3D *In Vitro* Skin Graft Substitutes using Functionalized Materials

Sujata Mohanty¹, Amtoj Kaur¹, and Swati Midha¹
¹Stem Cell Facility, All India Institute of Medical Sciences, New Delhi, India

FR-156

A Novel Adhesive Biomaterial for Cardiac Patch Technology

Dawn Bannerman¹, Locke Davenport Huyer¹, Miles Montgomery¹, and Milica Radisic¹
¹University of Toronto, Toronto, ON, Canada

FR-157

Hydroxyapatite Nanoparticle Density Affects Osteoblastic Differentiation Independent of Surface Roughness

Otto Juhl IV¹ and Henry Donahue¹
¹Virginia Commonwealth University, Richmond, VA

FR-158

Mimicking Mesenchymal Stem Cell Condensation to Promote Articular Cartilage Regeneration

Hannah A. Pearce¹, Yu Seon Kim¹, Jason L. Guo¹, and Antonios G. Mikos¹
¹Rice University, Houston, TX

FR-159

Microribbon-based Hydrogels with Mixed Compositions Accelerate Cartilage Regeneration with Biomimetic Mechanical Properties by MSCs in 3D

Courtney Gegg¹, Xinming Tong¹, and Fan Yang¹
¹Stanford University, Stanford, CA

FR-160

Shear-thinning Biomimetic Hydrogel to Repair Injured Cardiac Tissues: *In Vitro* and *In Vivo* Studies

Renaë Waters¹, Settimio Pacelli¹, Aparna Chakravarti¹, and Arghya Paul¹
¹University of Kansas, Lawrence, KS

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Developing Stable, Tunable and Bioinspired Nitric Oxide Releasing Biomaterials

Saleem Ibrahim¹, Heinrick Kufeldt¹, and Kanya Amoako¹
¹University of New Haven, West Haven, CT

Track: Biomaterials**Biomaterials Scaffolds**

FR-162

Polymeric Microparticles for Skin Wound Healing

Daniel Smith¹ and Sutapa Barua¹
¹Missouri University of Science and Technology, Rolla, MO

FR-163

Trash to Treasure: Utilization of Seafood Waste for Potential Biomedical Applications

Jayashree Chakravarty¹, Chen Lu Yang², Tracie Ferreira¹, and Christopher J. Brigham^{1,3}
¹University of Massachusetts Dartmouth, North Dartmouth, MA, ²University of Massachusetts Dartmouth, Fall River, MA, ³Wentworth Institute of Technology, Boston, MA

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Fabrication and Characterization of Electrospun Templates from Polydioxanone and Its Co-Polymers

William Cain¹, Allison Fetz¹, Cristina Fantaziu¹, and Gary Bowlin¹
¹University of Memphis, Memphis, TN

FR-165

Design of Enzymatically Triggered Shape Memory Polymers

Shelby Buffington¹, Matthew Ali², Justine Paul¹, Mark Macios¹, Patrick Mather^{1,2}, and James Henderson¹
¹Syracuse University, Syracuse, NY, ²Bucknell University, Lewisburg, PA

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Biomimetic Nanofibrous Scaffold Determines Phenamil-induced Stem Cell Differentiation

Yangxi Liu¹ and Hongli Sun¹
¹University of south Dakota, Sioux Falls, SD

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Size vs. Chemistry in Biomaterial Pathology

Dale Feldman¹
¹UAB, Birmingham, AL

FR-168

Synthesis, Characterization and Bioevaluation of Biodegradable Elastomeric Scaffolds with Tunable Mechanical Properties Via Thiol-ene Click ChemistryMohamed Mohamed^{1,2}, Julia Caserto¹, Magda Ak², and Hong Cheng¹¹University at Buffalo, Buffalo, NY, ²Mansoura University, Mansoura, Egypt

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Cell and Protein Patterning using Hydrogel-incorporated Electrospun Fiber ScaffoldsWon-Gun Koh¹¹Yonsei University, Seoul, Korea, Republic of

FR-170

Porous PCL-PLLA Semi-IPN Shape Memory Polymer (SMP) Scaffold Implants for Bone Defect RepairAbigail Roth¹, Lindsay Woodard¹, and Melissa Grunlan¹¹Texas A&M University, College Station, TX

FR-171

Microfibrous Scaffolds to Navigate Neural Stem CellsNicole Hashemi¹¹Iowa State University, Ames, IA

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Bone Formation Induced by Recombinant BMP-9 Coated Chitosan Microparticles Dispersed in Methylcellulose based Injectable GelBipin Gaihre¹ and Champa Jayasuriya¹¹University of Toledo, Toledo, OH

FR-173

Seeding Capacity of Synthetic Tissue Engineered Tracheal GraftsLauren Eichaker¹, Victoria Pepper², Cameron Best¹, Sayali Dharmadhikari¹, Nakesha King³, Jed Johnson⁴, Christopher Breuer¹, and Tendy Chiang¹¹Nationwide Children's Hospital, Columbus, OH, ²Loma Linda University Medical Center, Loma Linda, CA, ³The Ohio State University, Columbus, OH, ⁴Nanofiber Solutions, N. Hilliard, OH

FR-174

SIS/Reduced Graphene Oxide Nanocomposites for 3D Regenerative Scaffolds with Potential Application in Electrostimulation Therapy for Diabetic Ulcer TreatmentJulián A. Serna¹, Laura L. Cárdenas¹, Juan C. Cruz¹, Carolina Muñoz¹, and Juan C. Briceño¹¹Universidad de los Andes, Bogota, Colombia

FR-175

A Comparison of Osteoblast and Bacteria Functions on Micro Fibrous Scaffolds Produced by Electrospinning, Rotary-Jet Spinning and Airbrush ProcessesParia Ghannadian¹¹Northeastern University, Cambridge, MA

Track: Biomechanics, Biomaterials

Biomechanics of Biomaterials

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Mapping Biomechanical Properties of Porcine Costal CartilageEllen Hong¹, Lela Fossett¹, Wesley Moy¹, and Brian Wong¹¹University of California, Irvine, CA, CA

FR-179

Characterization of Composite Electrospun-Hydrogel Materials for Prosthetic Heart ValvesAlex Khang¹, Siliang Wu¹, John Carruth¹, Will Goth¹, James Tunnell¹, Elizabeth Cosgriff-Hernandez¹, and Michael Sacks¹¹The University of Texas at Austin, Austin, TX

FR-180

Using Biphasic Theory to Analyze Unconfined Compression of Murine Sclera and CorneaDillon Brown¹, Erica Landis², Mabelle Pardue^{1,2,3}, and Ross Ethier⁴¹Georgia Institute of Technology, Atlanta, GA, ²Emory University, Atlanta, GA, ³Atlanta VA Medical Center, Atlanta, GA,⁴Georgia Institute of Technology/Emory University, Atlanta, GA

FR-181

Evaluation of Articular Cartilage Anisotropy using Ultrasound TechniqueMostafa Motavalli¹, Jim Berilla¹, Mark Schluchter¹, Jean Welter¹, and Joseph Mansour¹¹Case Western Reserve University, Cleveland, OH

FR-182

Hypochlorous Acid Induced Changes in Suture Mechanical PropertiesStephen Pinnock¹, Stewart Maxfield¹, Robert Ferguson², and Anton Bowden¹¹Brigham Young University, Provo, UT, ²Intermountain Medical Center, Murray, UT

FR-183

Surface Characterization of Metallic Implants Created with a Novel Biofilm-Resistant Surface Modification ProcessCaroline Bales¹, Sarah Helms¹, and John DesJardins¹¹Clemson University, Clemson, SC

FR-184

Mechanical Characterization of Porcine Starting Material Reveals Location Dependent Auxetic BehaviorSamuel Lieber¹, Bin Zhang¹, Shawn Chester¹, Siva Nadimpalli¹, Justin Suriano¹, Nicholas Santoro¹, and David Theis²¹New Jersey Institute of Technology, Newark, NJ, ²Midwest Research Swine, LLC, Gibbon, MN

FR-185

Mechanical Characterization of Common Bioengineered Extracellular Matrices using Optically-Based Micro-indentationRachel Dass¹ and Kristen Mills¹¹Rensselaer Polytechnic Institute, Troy, NY

Friday, October 19 | 9:30 am–5:00 pm | GWCC Exhibit Hall

Poster Viewing with Authors & Refreshment Break | 9:30 am–10:15 am and 2:45 pm–3:30 pm

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Solvent Retention in Electrospun Fibers is Affected by Polymer Crystallinity and Affects Fiber Scaffold Mechanical CharacteristicsDevan Puhl¹, Anthony D'Amato¹, Michael Bramson¹, Jed Johnson², David Corr¹, and Ryan Gilbert¹¹Rensselaer Polytechnic Institute, Troy, NY, ²Ohio State University, Columbus, OH

Track: Biomechanics

Biomechanics of Rehabilitation/Injury

FR-187

Open-Source Wearable Sensor Based Method Feasible for Tracking Steps in Patients Recovering from StrokeLara Weed¹, Jon Robinson², Lisa Goodwin², and Ryan McGinnis¹¹University of Vermont, Burlington, VT, ²University of Vermont Medical Center, Burlington, VT

FR-188

GRAIL Based Sensory Perturbations—A New Tool to Assess Sensory Organization and Fall Risk During Walking in the ElderlyHarbir Bhatti¹ and Rahul Soangra¹¹Chapman University, Orange, CA

FR-189

Using Gyroscopic Measurements to Compare Spinal Twisting Angles Experienced During Walking, Running, and Cross-Country SkiingLukas Adamowicz¹ and Ryan McGinnis¹¹University of Vermont, Burlington, VT

FR-190

Torque Properties of Porcine Patellar TendonJasmine Ferrell¹, Cameron Boswell¹, and Lakiesha Williams¹¹Mississippi State University, Mississippi State, MS

FR-191

Assessment of Static Steadiness and Dynamic Stability at Various Stages of Healing a Grade 2 MCL Tear: A Case StudyKaycee Glatke¹, Michael Smith¹, Toshiki Tsuchiya¹, and Jakob Wells¹¹Arizona State University, Tempe, AZ

FR-192

Increasing Walking Speed Increases Lower-limb Capabilities for Generating Propulsive ForcesAshley E. Rice¹, Aravind Sundararajan¹, and Jeffrey A. Reinbolt¹¹University of Tennessee, Knoxville, TN

FR-198

A Novel Brace Design for Ulnar Collateral Ligament Injury Prevention and RehabilitationAndrew Wilzman¹¹Mercer University, Macon, GA

FR-199

Quantification of Ovine Pia Arachnoid Complex Biomechanical Properties and MorphologySophia Theodossiou¹, Nathan R. Schiele¹, Claire L. Majors¹, Xi Chen¹, Elena Tipton¹, Gordon Murdoch¹, Gabriel Potirniche¹, Bertrand C. W. Tanner², Sajid Suriya³, Martin Mortazavi³, and Bryn A. Martin¹¹University of Idaho, Moscow, ID, ²Washington State University, Pullman, WA, ³California Neurosurgical Institute, Thousand Oaks, CA

FR-200

The Relationship Between Muscle Volume and Tibia Bone Stress During RunningMara Thompson¹, Stephanie George¹, and Stacey Meardon¹¹East Carolina University, Greenville, NC

FR-201

The Relationship Between Plantar Pressure and Plantar Fascia Stiffness During GaitErica Bell¹, Stacie Ringleb², John Willson¹, Stacey Meardon¹, and Zachary Domire¹¹East Carolina University, Greenville, NC, ²Old Dominion University, Norfolk, VA

FR-202

Variation in the Stiffness of the Plantar Fascia Measured Using Shear Wave ElastographyErica Bell¹, Stacie Ringleb², John Willson¹, Stacey Meardon¹, and Zachary Domire¹¹East Carolina University, Greenville, NC, ²Old Dominion University, Norfolk, VA

FR-203

Visual-Guided Performance and Retention for Lower-Body Movements—Implications for Human-Machine InterfacesAniket Shah¹, Sean Sanford¹, Gabriella Borodyansky¹, and Raviraj Nataraj¹¹Stevens Institute of Technology, Hoboken, NJ

FR-204

Conformational Change of von Willebrand Factor (vWF) under Shear Flow in Microfluidic DevicesYi Wang¹, Wenpeng Cao¹, Luke Egan¹, X. Frank Zhang¹, and Xuanhong Cheng¹¹Lehigh University, Bethlehem, PA

FR-205

Comparison of Thermal Glove Wrist-Hand Orthoses in Their Effectiveness on Rheumatoid Arthritis Using the Arthritis Hand Function TestBrittany Mott¹, Stephanie Carey¹, Robert Frisina¹, William Lee¹, and John Carter¹¹University of South Florida, Tampa, FL

FR-206

Estimating Coronal Plane Trunk Muscle Maximum Isometric Force after Spinal Cord InjuryAkhil Bheemreddy¹, Naji Alibeji¹, Ronald Triolo^{1,2}, and Musa Audu¹¹Case Western Reserve University, Cleveland, OH, ²Louis Stokes Cleveland VA Medical Center, Cleveland, OH

FR-207

Accelerating Neuromotor Learning with Reward FeedbackDavid Hollinger¹ and Raviraj Nataraj¹¹Stevens Institute of Technology, Hoboken, NJ

FR-208

Measuring Finger Forces in Activities of Daily Living (ADLs) with a Custom-Made Force Glove

Edward Austin¹, Sara Winges², Charles Kearney³, Pedro Chacon Dominguez³, Prasanna Acharya³, and Jin-Woo Choi³
¹Louisiana State University/Baton Rouge General, Baton Rouge, LA, ²University of Northern Colorado, Greeley, CO, ³Louisiana State University, Baton Rouge, LA

Track: Orthopedic and Rehabilitation Engineering, Biomechanics

Orthopedic and Rehabilitation Engineering: Implant and Prosthetic Biomechanics

FR-215

An Experimental Investigation on Forces in Deep Hole Bone Drilling for Cochlear Implantation

Serena Chu¹ and JuEun Lee¹
¹University of the Pacific, Stockton, CA

FR-216

Effects of Wearing an Upper Limb Prosthesis on Standing Balance

Tara Shirvaikar¹, Rebecca Stine², Matthew Major^{2,3}, and Steven Gard^{2,3}
¹Northwestern University, Evanston, IL, ²Northwestern University, Chicago, IL, ³Jesse Brown VA Medical Center, Chicago, IL

FR-217

Innovative Customized 3D Printed Socket Design for Transtibial Amputees

Monica Robles¹ and Christiane Beyer¹
¹California State University, Long Beach, Long Beach, CA

FR-218

Development of Low Cost Skin Temperature Sensor for Lower Extremity Prosthesis Users

Derek Lura¹, Abel Perez de Alderete¹, and M. Jason Highsmith²
¹Florida Gulf Coast University, Fort Myers, FL, ²Department of Veterans Affairs, Washington, DC

FR-219

Design and Testing of a Unique Six Component Wear Tester for Orthopaedic Implants

Michael Voor¹, Joseph Kitchen¹, and Caitlin Stanton²
¹University of Louisville, Louisville, KY, ²Aptis Medical, Louisville, KY

FR-220

A Cadaveric Model for Passive Strain Sensing in Dynamic Hip Screws to Measure Fracture Stability

Nathan Carrington¹, Paul Milhouse¹, Caleb Behrend², Tom Pace³, Jeffrey Anker¹, and John DesJardins¹
¹Clemson University, Clemson, SC, ²Virginia Tech Carilion School of Medicine and Research Institute, Roanoke, VA, ³Greenville Health System, Greenville, SC

FR-221

MRI-Driven Finite Element Predictions of Residual Limb Stiffness in Response to Limb Revision

Joshua Childress¹, Nicholas Fey¹, and Emily Levy¹
¹University of Texas at Dallas, Richardson, TX

FR-222

Does Peripheral Visual Feedback Influence Kinematic Precision during Rapid Feedforward Wrist Movements?

Morteza Asgari¹ and Dustin Crouch¹
¹University of Tennessee, Knoxville, TN

FR-223

Modular Prosthetic Foot for Pediatric Amputees

Darby DeStefano¹, Aditya Bhalla², Guido Porcelli³, Mike Salas⁴, and Sally Shady⁵
¹Stevens Institute of Technology, Centerville, MD, ²Stevens Institute of Technology, Hawthorne, NJ, ³Stevens Institute of Technology, Congers, NY, ⁴Stevens Institute of Technology, Newark, NJ, ⁵Stevens Institute of Technology, Hoboken, NJ

FR-224

Improved Force Distribution in Novel Passively Cooled Socket

Andrew Smith¹, Patrick Hogan¹, and Ricardo Ruiz¹
¹Arizona State University, Tempe, AZ

FR-225

Clinical Gait Analysis of Transtibial Amputee Fitted with Mercer Universal Prosthesis

Bich Nguyen¹, Ha Vo¹, Trung Le¹, Lawrence Webb², Edward O'Brien¹, and Richard Kunz¹
¹Mercer University, Macon, GA, ²Orthopaedic Trauma Institute, Macon, GA

FR-226

Linking Visually-based Cognitive Agency and Hand Grasp Performance

Aniket Shah¹, Sean Sanford¹, and Raviraj Nataraj¹
¹Stevens Institute of Technology, Hoboken, NJ

Track: Orthopedic and Rehabilitation Engineering, Biomechanics

Orthopedic: Mechanobiology and Mechanotransduction

FR-227

Confinement of Human Intervertebral Disc Cells on Micropatterned Adhesive Islands Regulates Cellular Behavior

Julie Speer¹, Thomas McGrath¹, Benjamin Liu¹, Bapi Sarker¹, Bailey Fearing¹, Liufang Jing¹, Michael Kelly², Jacob Buchowski², Lukas Zebala², Munish Gupta², Lori Setton¹, and Amit Pathak¹
¹Washington University in St. Louis, St. Louis, MO, ²Washington University School of Medicine, St. Louis, MO

FR-229

Development of a Novel Eccentric Muscle Loading Approach to Investigate Achilles Tendon Adaptation

Sabah Rezvani¹, Robert Grange¹, Linda Dahlgren¹, P. Gunnar Brolinson², and Vincent Wang¹
¹Virginia Tech, Blacksburg, VA, ²Edward Via College of Osteopathic Medicine, Blacksburg, VA

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Motility of Lipid Microbubble on MC3T3 Cells with LIPUS Enhances Cell Proliferation

Richie Ramdhanie^{1,2}, Connor Watson¹, Wonsae Lee¹, Xiaofei Li¹, and Yi-Xian Qin¹
¹Stony Brook University, Stony Brook, NY, ²Vasomedical Inc., Plainview, NY

FR-231

Exercise Effects on Gait in a Rodent Model of Osteoarthritis

Brittany Jacobs¹ and Kyle Allen¹
¹University of Florida, Gainesville, FL

FR-232

The Influence of Mini-Fragment Plates on the Mechanical Properties of Long-bone Plate Fixation

Riley Knox¹, Safa Herfat¹, and Meir Marmor¹
¹University of California, San Francisco, San Francisco, CA

FR-233

Genetic Variation Affects Mouse Bone Response to Mechanical Unloading

Michael Friedman¹, Yue Zhang¹, Camilla Reina Maroni^{1,2}, Jennifer Wayne¹, Charles Farber³, and Henry Donahue¹
¹Virginia Commonwealth University, Richmond, VA, ²University "G. d'Annunzio" Chieti-Pescara, Chieti, Italy, ³University of Virginia, Charlottesville, VA

FR-234

Micromotion and Strength of the Glenoid Component in Reverse Total Shoulder Arthroplasty: The Effect of Malpositioning Versus Optimal Clinical Positioning in the Simulated B2 Glenoid

Shannon Hall¹, John DesJardins², David Baxley², Michael Kissenberth, MD³, Josh Karnes⁴, and Nick Metcalfe⁴
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FR-235

Tenocyte Viability Exhibits Strain-Dosage Dependence in Intact Rat Tail Tendon Fascicles

Jared Muench¹, Darryl Thelen¹, and Corinne Henak¹
¹University of Wisconsin-Madison, Madison, WI

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Biomechanical Relation Between Horse and Rider in Therapeutic Horseback Riding and its Effect on Balance in Elderly

Anne Marie Holter¹, Julia Gates¹, Nathan Luzum¹, John DesJardins¹, Kristine Vernon¹, and Marieke Van Puymbroeck¹
¹Clemson University, Clemson, SC

FR-237

Lateral Stabilization Plates Increase the Strength of Sternal Fixation with Cerclage Wires

Karim Tarabein¹ and Kris Billiar¹
¹Worcester Polytechnic Institute, Worcester, MA

FR-238

A Novel Elastomer Cervical Total Disc Replacement Preserves Biomechanics of Spine: A Finite Element Study

Ali Kiapour¹ and Vijay Goel¹
¹Engineering Center for Orthopaedic Research Excellence, The University of Toledo, Toledo, OH

Track: Orthopedic and Rehabilitation Engineering

Articular Cartilage, Meniscus and Joints

FR-239

An IL-1 β Mediated Model of Osteochondral Tissue Catabolism

Kalon Overholt¹, Rocky Tuan¹, and Riccardo Gottardi¹
¹University of Pittsburgh, Pittsburgh, PA

FR-240

Ankle Joint Contact Stress Estimation and Validation using Accurate Geometry Finite Element Model

Sofya Pugach¹, Chaudhry Hassan¹, and Yi-Xian Qin¹
¹Stony Brook University, Stony Brook, NY

FR-241

Fibula Osteotomy as an Alternative of Improved Joint Contact Loading for Medial Decompression of Varus Deformed Human Knee

Chaudhry Hassan¹, Mikhail Gurevich¹, Saman Vojdani¹, Brandon Denney¹, David Komatsu¹, James Penna¹, and Yi-Xian Qin¹
¹Stony Brook University, Stony Brook, NY

FR-242

Effect of Nutraceuticals on Chondrogenesis of Engineered Bovine Articular Cartilage Tissue

Alia Mallah¹, Mahmoud Amr¹, Hanneb Abusharkh¹, Arda Gozen¹, Juana Mendenhall², Bernard Van Wie¹, and Nehal Abu-Lail¹
¹Washington State University, Pullman, WA, ²Morehouse College, Atlanta, GA

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The Effects of Moderate Gamma Irradiation on Mechanical Properties of Porcine Articular Cartilage

Hannah Cash¹, Jeffrey Willey², and Delphine Dean¹
¹Clemson University, Clemson, SC, ²Wake Forest University, Winston Salem, NC

Track: Device Technologies and Biomedical Robotics, Orthopedic and Rehabilitation Engineering

Musculoskeletal Robotics and Biomechatronics in Rehabilitation

FR-244

Motorized Elliptical Gait Trainer for a Child with CP

Andres Guerrero¹, Steve Thompson¹, and Alan Eberhardt¹
¹University of Alabama at Birmingham, Birmingham, AL

FR-245

A Supervised Rehabilitation Scheme Using NAO Robot

Md Assad-Uz-Zaman¹, Md Rasedul Islam¹, Christopher Spiewak¹, and Mohammad Rahman¹
¹UWM, Milwaukee, WI

FR-246

A Soft Dynamic Ankle-Foot Orthosis Exosuit for Gait Assistance with Foot Drop

Carly Thalman¹, Skyler Moore¹, Joshua Hsu¹, Laura Snyder², and Panagiotis Polygerinos¹
¹Arizona State University, Mesa, AZ, ²Barrow Neurological Institute, Phoenix, AZ

FR-247

Development of Input/Output Based Model for the Implementation of McKibben Muscles in Rehabilitation Devices

Anderson Camp¹ and Paola Jaramillo Cienfuegos¹
¹United States Naval Academy, Annapolis, MD

FR-248

Pilot Study: Development and Preliminary Verification of Pressure-Guided Tool for Transtibial Socket Fit Assessment

Negin Behzadian¹, Andrew Lee¹, Gary Berke¹, and Ross Venook¹
¹Stanford University, Stanford, CA

Track: Biomedical Imaging and Instrumentation

Imaging Techniques for Musculoskeletal System

FR-249

Ultrasonic Characterization of Osteoporosis in a Bovine Femoral Head

Mersim Redzematovic¹, Ryan Young¹, Megan Murphy¹, Seth Hogg², David M. Rooney¹, and Sleiman R. Ghorayeb^{1,3,4}
¹Ultrasound Research Lab, DeMatteis School of Engineering and Applied Sciences, Hofstra University, Hempstead, NY, ²Micro Photonics Inc., Allentown, PA, ³Radiology and Molecular Medicine, Zucker School of Medicine at Hofstra/Northwell, Hempstead, NY, ⁴Feinstein Institute for Medical Research, Manhasset, NY

Track: Biomedical Imaging and Instrumentation, Cellular and Molecular Bioengineering

Approaches in Cellular/Molecular Imaging and Tracking

FR-250

Measuring Cell Contractility Using Quantitative Polarization Microscopy

Wenjun Wang¹, Joseph Miller², Susan Pannullo³, Cynthia Reinhart-King^{1,2}, and Francois Bordeleau¹
¹Vanderbilt University, Nashville, TN, ²Cornell University, Ithaca, NY, ³Weill Cornell Medical College, New York, NY

FR-251

Analysis of Optical Scattering Systems Using Phase Singularities

Anindya Majumdar¹ and Sean Kirkpatrick¹
¹Michigan Technological University, Houghton, MI

FR-252

Synchronously Amplified Photoacoustic Image Recovery (SAPhIRe)

Aida Demissie¹, Donald Vanderland¹, MD Shariful Islam¹, Stanislav Emelianov¹, and Robert Dickson¹
¹Georgia Institute of Technology, Atlanta, GA

FR-253

Measurement of Water Flux through Aquaporin of Erythrocyte with Fluorescence

Akrm Abdalrahman¹ and Guiren Wang¹
¹University of South Carolina, Columbia, SC

FR-254

Material Identification from Spectral CT Using Effective Atomic Number and Electron Density

Xu Dong¹, Olga Pen², Zhicheng Zhang³, and Guohua Cao¹
¹Virginia Tech, Blacksburg, VA, ²Wake Forest University, Winston-Salem, NC, ³Chinese Academy of Sciences, Shen Zhen, China, People's Republic of

FR-255

Resolve the Surface Topography and Interfacial Interaction Through Force Mapping with Free Energy Landscape Reconstruction

Alan Liu¹, Ahmad Haider¹, and Todd Sulchek¹
¹Georgia Institute of Technology, Atlanta, GA

FR-256

Developing a Real-Time Contour Based Cell Tracking Algorithm

Shelby Buffington¹, Bence Kotis¹, Philip Mohun¹, and James Henderson¹
¹Syracuse University, Syracuse, NY

FR-257

The Effect of Host-Cell Clustering on Macrophage Migration in Mycobacterial Infection

Danielle Stolley¹ and Elebeoba May¹
¹University of Houston, Houston, TX

Track: Biomedical Imaging and Instrumentation

Architecture and Design of Imaging Systems

FR-258

A Novel Early Diagnosis System for Diabetic Retinopathy Based on Local Features from OCTA Scans

Nabila Eladawi^{1,2}, Mohammed Elmogy², Luay Fraiwan³, Francesco Pichi⁴, Mohammed Ghazal³, Ahmed Aboelfetouh¹, Alaa Riad¹, Robert Keynton², Shlomit Schaal⁵, and Ayman El-Baz²
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FR-259

Detectability Of Nodule By Four-Projection Tomosynthesis Corresponding To X-Ray Dose

Kensuke Hori¹, Juzhong Dong², Hiromasa Okamoto³, Masashi Seki³, Hiroshi Muraishi¹, Norio Saito², Thet Thet Lwin¹, Hidetake Hara¹, Takara Watanabe⁴, Takeyuki Hashimoto⁵, Bo Wang², and Tohoru Takeda¹
¹Kitasato University, Sagamihara, Japan, ²Tsukuba Technology Co., Ltd., Tsukuba, Japan, ³Kitasato University Hospital, Sagamihara, Japan, ⁴Tokyo Metropolitan University, Arakawa, Japan, ⁵Kyorin University, Mitaka, Japan

Track: Biomedical Imaging and Instrumentation

Magnetic Resonance Imaging (MRI)

FR-260

Improved MRI-based Myocardial T1 and Extracellular Volume (ECV) Confidence Map Approach for Clinical Quantitative Analysis

Nilkanth Patel¹, Akiko Tanaka², Takeyoshi Ota², Amit R. Patel², and Keigo Kawaji^{1,2}
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FR-261

Minimum Peak Power Root-Fipped gSlider-SMS RF Pulses for High-Resolution *In Vivo* Diffusion MRI

Jun Ma¹, Thomas Witzel², Kawin Setsompop², and William Grissom¹
¹Vanderbilt University Institute of Imaging Science, Nashville, TN, ²Athinoula A. Martinos Center for Biomedical Imaging, Massachusetts General Hospital, Charlestown, MA

FR-262

New Algorithms for CS-MRI: WTWTS, DWTS, WDWTS

Srivarna Settisara Janney¹ and Sumit Chakravarty¹
¹Kennesaw State University, Marietta, GA

FR-263

31-P MR Spectroscopy Calf Coil and Foot Flexion System for 1 T Extremity Scanner

Travis Carrell¹, Minyu Gu¹, Clayton Cruthirds¹, Marielle Engelen¹, Nicolaas Deutz¹, Steven Wright¹, and Mary McDougall¹
¹Texas A&M University, College Station, TX

FR-264

MRI-based Investigation into the Effects of Simulated Microgravity on Cerebrospinal Fluid and Vascular Flow

Stephanie Collins¹, Ross Ethier², and John Oshinski²
¹Georgia Institute of Technology, Norcross, GA, ²Georgia Institute of Technology, Atlanta, GA

FR-265

Perfusion Imaging of Rat Spinal Cord Using Arterial Spin Labeling: A Feasibility Study

Seongtaek Lee¹, Matthew Budde¹, Natasha Wilkins¹, Shekar Kurpad¹, and Brian Schmitz²
¹Medical College of Wisconsin, Milwaukee, WI, ²Marquette University, Milwaukee, WI

FR-266

Quantitative Susceptibility Mapping Using ARMA Field Map for Assessment of Hepatic Iron Overload

Aaryani Tipirneni-Sajja¹ and Claudia Hillenbrand¹
¹St. Jude Children's Research Hospital, Memphis, TN

FR-267

A 16-Channel Mock Receiver Interface Box for MR Array Coil Design

Romina Del Bosque¹ and Mary McDougall¹
¹Texas A&M University, College Station, TX

FR-268

Design and Manufacturing of Microstrip Power Splitters for Array-Compressed Parallel Transmit MRI

Gabriela Gallego¹, Charlotte Sappo¹, Xinqiang Yan¹, and William Grissom¹
¹Vanderbilt University, Nashville, TN

FR-269

Agarose Phantoms as a Model for the Mechanical Properties of the Brain for Use in MR Elastography

Grace McIlvain¹, Elahe Ganji¹, Megan L. Killian¹, and Curtis L Johnson¹
¹University of Delaware, Newark, DE

FR-270

Chiari Malformation Brain Morphology After Decompression Surgery in Adult Female Participants

Maggie Eppelheimer¹, Audrey Braun¹, Dipankar Biswas¹, James Houston¹, Jayapalli Bapuraj², and Francis Loth¹
¹The University of Akron, Akron, OH, ²University of Michigan, Ann Arbor, MI

FR-271

Impact of Vibration Frequency on Estimated Mechanical Property Maps in MR Elastography

Peyton L Delgorio¹ and Curtis L Johnson¹
¹University of Delaware, Newark, DE

FR-272

Component Analysis of Multinuclear Cable-Traps for 3T MRI/MRS

Matthew Wilcox¹ and Mary McDougall¹
¹Texas A&M University, College Station, TX

FR-273

Low Rank Plus Sparse Compressed Sensing (CS) Reconstruction for Accelerated Proton Resonance Frequency Shift Magnetic Resonance Temperature Imaging

Zhipeng Cao¹ and William Grissom¹
¹Vanderbilt University, Nashville, TN

FR-274

Identifying Significant Activation Resting State Activation Components in Autistic Subjects using Semi-Restricted Boltzmann machines

Omar Dekhil¹, Mohamed Ali¹, Ahmed Shalaby¹, Robert Keynton¹, Mohammed Ghazal¹, Adel Elmaghraby¹, Gregory Barnes¹, and Ayman El-Baz¹
¹University of Louisville, Louisville, KY

FR-275

A Novel Detailed CAD System for Mild Cognitive Impairment Diagnosis Based on Feature Fusion of sMRI

Fatma El-zahraa Elgamel^{1,2}, Mohammed Elmogy², Mohammed Ghazal^{2,3}, Hassan Soliman¹, Ahmed Atwan¹, Robert Keynton², Gregory Barnes⁴, and Ayman El-Baz²
¹Faculty of Computers and Information, Mansoura University, Mansoura, Egypt, ²University of Louisville, Louisville, KY, ³Abu Dhabi University, Abu Dhabi, United Arab Emirates, ⁴University of Louisville Autism Center, University of Louisville, Louisville, KY

FR-276

Inter-Scanner Identifiability Based on Resting-State Functional ConnectomesSumra Bari¹, Enrico Amico¹, Thomas Talavage¹, and Joaquin Goni¹
¹Purdue University, West Lafayette, IN

FR-277

Magnetic Resonance Imaging with Light Microscopy: A Dual System of ImagingIrvane Ngnie Kamga¹, Zachary Baker², Linda Azab², and Brenda Nguonly²
¹George Mason University, Fairfax, Virginia, VA,
²George Mason University, Fairfax, VA

FR-278

A Novel MRA- Based Framework for Correlating Cerebrovascular Changes to MAPHeba Kandil^{1,2}, Ahmed Soliman¹, Guruprasad Giridharan¹, Ali Mahmoud¹, Ahmed Shalaby¹, Mohammed Ghazal³, Adel Elmaghaby¹, and Ayman El-Baz¹
¹University of Louisville, Louisville, KY, ²Faculty of Computers and Information, Mansoura University, Mansoura, Egypt, ³University of Abu Dhabi, Abu Dhabi, United Arab Emirates**Track: Biomedical Imaging and Instrumentation****Ultrasound Imaging and Therapeutic Ultrasound**

FR-279

The Development of Gas-generating Gold Nanoparticles for Contrast Enhanced Ultrasound ImagingIn-Cheol Sun¹ and Stanislav Emelianov¹
¹Georgia Tech, Atlanta, GA

FR-280

Super-Resolution Ultrasound Imaging of Tissue Microvasculature and Dysfunction Due to DiseaseKatherine Brown¹, Shashank Sirsi^{1,2}, and Kenneth Hoyt^{1,2}
¹University of Texas at Dallas, Richardson, TX, ²University of Texas Southwestern Medical Center, Dallas, TX

FR-281

Segmentation of Endocardium in Parasternal Short-axis Echocardiograms using Dynamic ProgrammingAddison Elliott¹, Akhila Karlapalem¹, Amy Givan¹, Maria Fernandez-del-Valle¹, and Jon Klingensmith¹
¹Southern Illinois University Edwardsville, Edwardsville, IL

FR-282

Ultrasonic Assessment of Lingual Tissue Containing an Abnormal MassChae Eun Lim¹, Raymond Toncich¹, Megan Murphy¹, and Sleiman R. Ghorayeb^{1,2,3}
¹Ultrasound Research Lab, DeMatteis School of Engineering and Applied Sciences, Hofstra University, Hempstead, NY, ²Radiology and Molecular Medicine, Zucker School of Medicine at Hofstra/Northwell, Hempstead, NY, ³Feinstein Institute for Medical Research, Manhasset, NY

FR-283

Multiscale Analysis of Super-Resolution Ultrasound Images of Tissue Microvascular NetworksIpek Oezdemir¹ and Kenneth Hoyt¹
¹University of Texas at Dallas, Dallas, TX

FR-284

Real-Time Spatiotemporal Control of Microbubble OscillationsArpit Patel¹, Scott Schoen Jr¹, and Costas Arvanitis¹
¹Georgia Institute of Technology, Atlanta, GA

FR-285

Super-Resolution Passive Acoustic Imaging of MicrobubblesScott Schoen Jr¹, Zhigen Zhao¹, and Costas Arvanitis¹
¹Georgia Institute of Technology, Atlanta, GA

FR-286

Quantitative Monitoring and Control of Tumor Vascular Permeability in Tumors using Ultrasound Contrast Agents: An Advanced Method for Predicting Drug Uptake in TumorsAditi Bellary¹, Rojin Eslami¹, Arely Jasso¹, Quincy Undseth¹, Sonia Hernandez², Bianca Lec², Sumbul Shaikh³, Rajiv Chopra³, Jessica Kandel², Mark Borden⁴, and Shashank Sirsi⁵
¹University of Texas Dallas, Richardson, TX, ²The University of Chicago Medicine & Biological Sciences, Chicago, IL, ³University of Texas Southwestern, Dallas, TX, ⁴University of Colorado, Boulder, CO, ⁵University of Texas Dallas, Richardson, TX

FR-287

Projection Based Total Least Square Algorithm for Ultrasound TomographyAnita Carevic¹, Jesse Barlow², and Mohamed Almekkawy²
¹University of Split, Split, Croatia, ²Penn State University, University Park, PA

FR-288

Low-frequency (20 kHz), Low-intensity (100 mW/cm²) Ultrasound Accelerates Healing in Diabetic Chronic Wound Pilot StudyOlivia Ngo¹, Vivinya Gunasekaran¹, Evan Neimann¹, Prabagar Sankar¹, Alec Lafontant¹, Sumati Nadkarni¹, Rose Ann DiMaria-Ghalili¹, Michael Neidrauer¹, Leonid Zubkov¹, Michael Weingarten¹, David Margolis², and Peter Lewin¹
¹Drexel University, Philadelphia, PA, ²University of Pennsylvania, Philadelphia, PA

FR-289

Intraoperative Quantitative Ultrasound for Tissue Differentiation; Pilot StudyMohamed Almadhi¹, Wei-Chiang Lin¹, Anthony Giordano¹, and Harmens Marc¹
¹Florida International University, Miami, FL

FR-290

All-in-one Ultrasound, Photoacoustics, and Elasticity Imaging: Configurable System Design and DemonstrationHeechul Yoon¹, Yiyang Zhu¹, Donald VanderLaan¹, adakkancheril Jisha¹, Andrei Karpiouk¹, and Stanislav Emelianov^{1,2}
¹Georgia Institute of Technology, Atlanta, GA, ²Emory University School of Medicine, Atlanta, GA

FR-291

Effect of Ultrafast Pulse Shape on Ultrasound Imaging Laser-Activated Phase-Change Nanodroplets

Yiyang Zhu¹, Heechul Yoon¹, Andrew Zhao^{1,2}, and Stanislav Emelianov^{1,2}
¹Georgia Institute of Technology, Atlanta, GA, ²Emory University School of Medicine, Atlanta, GA

FR-292

Wearable Ultrasound Patch for Therapeutic Applications

Vivinya Gunasekaran¹, Olivia Ngo¹, Evan Niemann¹, Prabagar Sankar¹, Alec Lafontant¹, Rose Ann DiMaria-Ghalili¹, Dr. Michael Neidraeur¹, Dr. David Margolis², Dr. Leonid Zubkov¹, Dr. Michael Weingarten¹, and Dr. Peter Lewin¹
¹Drexel University, Philadelphia, PA, ²University of Pennsylvania, Philadelphia, PA

FR-293

Ultrasound Assessment of Internal Tissue Pressure and Implications to Diagnosis

Jingfei Liu¹, Heechul Yoon¹, and Stanislav Emelianov^{1,2}
¹Georgia Institute of Technology, Atlanta, GA, ²Emory University School of Medicine, Atlanta, GA

FR-294

Simultaneous Comparison of Ultrasound Imaging Strategies and Acoustic Power for Microbubble Contrast Agent Detection

Sarah Tempelmeyer¹, Katherine Brown¹, and Kenneth Hoyt^{1,2}
¹The University of Texas at Dallas, Richardson, TX, ²University of Texas Southwestern Medical Center, Dallas, TX

FR-295

Treatment of Post-Traumatic Joint Contracture Using Pulsed, High Intensity Ultrasound and Laser in Rabbit Animal Model

David Hazlewood¹, Yi Feng², Qinghua Lu², Jinxi Wang², and Xinmai Yang¹
¹University of Kansas, Lawrence, KS, ²University of Kansas Medical Center, Kansas City, KS

FR-296

Muscle Stiffness Outcomes at Curve Concavity in AIS Patients using Ultrasound Shear Wave Elastography

Daniela Galeano-Garcés¹, Hugo Giambini¹, Todd Milbrandt¹, and A. Noelle Larson¹
¹Mayo Clinic, Rochester, MN

FR-297

Super Resolution Ultrasound Imaging using Low-Boiling Point Phase-Change Contrast Agents

Juan Rojas¹, Ryan DeRuiter¹, Thomas Kierski¹, and Paul Dayton¹
¹University of North Carolina Chapel Hill, Chapel Hill, NC

Track: Biomedical Imaging and Instrumentation

Image Processing and Analysis, Modeling, Data Science and Informatics

FR-298

Computer-Assisted Quantification of Glaucoma-Induced Axonal Damage in Rat Optic Nerves

Matthew Ritch¹, Bailey Hannon¹, A. Thomas Read¹, Eva Dyer¹, Juan Reynaud², Grant Cull², Claude Burgoyne², and C. Ross Ethier¹
¹Georgia Institute of Technology, Atlanta, GA, ²Devers Eye Institute, Legacy Health System, Portland, OR

FR-299

Quanti.us: Flexible, High-Performance Crowd-Annotation of Images at 100,000-Clicks-Per-Hour

Alex Hughes¹, Joseph Mornin², Sujoy Biswas³, Lauren Beck¹, David Bauer⁴, Arjun Raj¹, Simone Bianco³, and Zev Gartner⁴
¹University of Pennsylvania, Philadelphia, PA, ²Independent researcher, San Francisco, CA, ³IBM Almaden Research Center, San Jose, CA, ⁴University of California, San Francisco, San Francisco, CA

FR-300

Application of CNN in Anatomic Location Recognition of Trabecular Bones

Neda Shafiei¹, Edward Guo², and Xiaodu Wang¹
¹University of Texas at San Antonio, San Antonio, TX, ²Columbia University, New York, NY

FR-301

Apoptosis Detection via Automated Algorithms to Analyze Biomarker Translocation in Reporter Cells

A.H. Ahmed¹, Joanne Lee¹, Zeynep Dereli-Korkut¹, Sidra Waqas¹, Sihong Wang¹, and Xuejun Jiang²
¹The City College of the City University of New York, New York, NY, ²Memorial Sloan Kettering Cancer Center, New York, NY

FR-302

Deep Learning in Processing Clock Drawing Tests

Anis Davoudi¹, Benjamin Shickel², Kumar Rohit Malhotra², Catherine C. Price², Patrick J. Tighe², and Parisa Rashidi²
¹University of Florida, Gainesville, FL, ²University of Florida, Gainesville, FL

FR-303

Efficient Color Normalization for Pathological Images Using Optimal Transport

Li Tong¹, Hang Wu², and May Wang¹
¹Georgia Institute of Technology and Emory University, Atlanta, GA, ²Georgia Institute of Technology, Atlanta, GA

FR-304

Comparison of Bovine Versus Human Collagens to Create a Biophotonic Model of Tissue

Suhaib Hashem¹, Eiji Isomura¹, and Joe Lo¹
¹University of Michigan at Dearborn, Dearborn, MI

FR-305

Atlas-Based Automatic Segmentation of Skeletal Bone and MuscleAustin Moore¹, Scott Gayzik¹, and Jazmine Aira¹
¹Wake Forest School of Medicine, Winston-Salem, NC

FR-306

Novel Data Visualization for Cardiomyocyte Tissue AssessmentBrandon Riehl¹, Akankshya Shradhanjali¹, and Jung Yul Lim¹
¹University of Nebraska-Lincoln, Lincoln, NE

FR-307

An Innovative 3D Adaptive Patient-Related Atlas for Automatic Segmentation of Retina Layers from OCT ImagesAhmed Sleman¹, Ahmed Eltanboly¹, Ahmed Soliman¹, Mohammed Ghazal¹, Harpal Sandhu¹, Shlomit Schaal², Robert Keynton¹, Adel Elmaghaby¹, and Ayman El-Baz¹
¹University of Louisville, Louisville, KY, ²University of Massachusetts Medical School, Worcester, MA

FR-308

Influence of Eye Size and Shape on Dose of Non-targeted Ocular StructuresDaniel El Basha¹, Takuya Furuta², Siva R Iyer¹, and Wesley E Bolch¹
¹University of Florida, Gainesville, FL, ²Japan Atomic Energy Agency, Ibaraki, Japan

FR-309

Early Detection of Diabetic Retinopathy in Optical Coherence Tomography Images Using Convolutional Neural NetworksMohammed Ghazal¹, Samr Ali¹, Ahmed ElTanboly², Ali Mahmoud², Francesco Pichi³, and Ayman El-Baz¹
¹Abu Dhabi University, Abu Dhabi, United Arab Emirates, ²University of Louisville, Louisville, KY, ³Cleveland Clinic Abu Dhabi, Abu Dhabi, United Arab Emirates

FR-310

Pressure Ulcer Tissues Segmentation System Based on Fusing Different Feature Modalities and Deep Learning TechniqueMohammed Elmogy¹, Begoña García-Zapirain², Connor Burns¹, Adel Elmaghaby¹, and Ayman El-Baz¹
¹University of Louisville, Louisville, KY, ²Universidad de Deusto, Bilbao, Spain

FR-311

Design, Development and Validation of an Automated Method of Calculating Parameters from CT scans: With Potential Implications to Determine the Surgical Viability of a PatientSarah Sukardi¹, Zachary Pennington², A. Karim Ahmed², Daniel Sciubba², and Amir Manbachi¹
¹Johns Hopkins University, Baltimore, MD, ²Johns Hopkins School of Medicine, Baltimore, MD

FR-312

Prostate Cancer Diagnosis Using Convolutional Neural NetworkIslam Reda^{1,2}, Babajide Ayinde¹, Mohammed Elmogy¹, Ahmed Aboufotouh², Ahmed Shalaby¹, Mohamed Abou El-Ghar², Adel Elmaghaby³, Mohammed Ghazal⁴, and Ayman El-Baz¹
¹University of Louisville, Louisville, KY, ²Mansoura University, Mansoura, Egypt, ³University of Louisville, Louisville, Egypt, ⁴Abu Dhabi University, Abu Dhabi, United Arab Emirates

FR-313

A Convolutional Neural Network Model to Assist Radiological Diagnosis of 3D Medical Images: Application to Shoulder Labral TearsDaniel Clymer¹, Jason Long², Carmen Latona², Sam Akhavan², Jonathan Cagan¹, and Philip LeDuc¹
¹Carnegie Mellon University, Pittsburgh, PA, ²Allegheny Health Network, Pittsburgh, PA

FR-314

Radiomic Analysis for Cardiovascular Disease Prediction Using Wavelet FeaturesJames Dormer¹, Carolyn Reilly², Eduard Schreibmann², and Baowei Fei^{1,2,3}
¹University of Texas at Dallas, Richardson, TX, ²Emory University, Atlanta, GA, ³University of Texas Southwest Medical Center, Dallas, TX

FR-315

An Automatic Quantitative Segmentation Method for Hemorrhagic Stroke Research in RatsZhexuan Zhang¹, Hever Navarro², Ashish Rehani², Kunjan Dave², and Weizhao Zhao¹
¹University of Miami, Coral Gables, FL, ²University of Miami School of Medicine, Miami, FL

FR-316

Anatomical Characteristic of Cerebral Capillary Morphology in CADASIL PatientsNicholas Schaub¹, Kevin Pasquale¹, Benjamin Roskiewicz¹, Joseph Corey¹, and Michael Wang²
¹University of Michigan, Ann Arbor, MI, ²Neurology, Ann Arbor, MI

FR-317

Investigation of Neurovascular Coupling in Different Vigilance States of the Human Brain using Simultaneous EEG-fNIRS MeasurementsParisa Rabbani¹, Olajide Babawale¹, Mobasshir Akash¹, and Hanli Liu¹
¹University of Texas at Arlington, Arlington, TX

FR-318

Stent Visibility Improvement by Using a Spatial-temporal Contrast Enhancement Filter in X-ray FluoroscopyYuhao Jiang¹
¹University of Central Oklahoma, Edmond, OK

FR-319

Multi-Modality Brain Image Co-RegistrationSkylar Stolte¹, Yao Xiao¹, and Ruogu Fang¹
¹University of Florida, Gainesville, FL

FR-320

Automation of Radiodensity Analysis of Irradiated Trabecular BoneAlexander Borg¹, Michael Munley¹, J. Daniel Bourland¹, Greg Dugan¹, John Olson¹, Catherine Okoukoni¹, J. Mark Cline¹, and Jeffrey Willey¹
¹Wake Forest University, Winston-Salem, NC

FR-321

Regulated-Convolutional Networks for Low-Dose Cerebral CT Perfusion RestorationPeng Liu¹, Yangjunyi Li¹, Mohammad D. El Basha¹, and Ruogu Fang¹
¹University of Florida, Gainesville, FL

Friday, October 19 | 9:30 am–5:00 pm | GWCC Exhibit Hall

Poster Viewing with Authors & Refreshment Break | 9:30 am–10:15 am and 2:45 pm–3:30 pm

FR-322

Comprehensive Framework for Automatic Diagnosing and Grading of Diabetic Retinopathy that Uses Optical Coherence Tomography (OCT) Images.

Ahmed El Tanboly^{1,2}, Ahmed Shalaby¹, Mohammed Ghazal¹, Harpal Sandhu¹, Guruprasad Giridharan¹, Robert Keynton¹, Magdi El-Azab², and Ayman El-Baz¹
¹University of Louisville, Louisville, KY, ²University of Mansoura, Mansoura, Egypt

FR-323

Segmentation and Tracking of Multiple Landmarks on Body of Running Rodents for Neuroscience and Biomechanics Applications

Omid Haji Maghsoudi¹, Annie Vahedipour¹, Benjamin Robertson¹, and Andrew Spence¹
¹Temple University, Philadelphia, PA

Track: Biomedical Imaging and Instrumentation**Imaging Contrast Agents, Therapeutic Agents and Theranostic Agents**

FR-324

Simultaneous Comparison of Ultrasound Imaging Strategies for Microbubble Contrast Agent Detection

Katherine Brown¹, Mawia Khairalseed¹, and Kenneth Hoyt^{1,2}
¹University of Texas at Dallas, Richardson, TX, ²University of Texas Southwestern Medical Center, Dallas, TX

FR-325

Rapid Generation of Peptide-IR783 Fluorophore Conjugates for Targeted Near-IR Probes

Euna Kwak¹, LeNaiya Kydd², Butaek Lim², and Justyn Jaworski²
¹The University of Arizona, Tucson, AZ, ²The University of Texas at Arlington, Arlington, TX

FR-326

Comparison of Three Vessel Painting Agents Used for Optical Clearing-Mediated Three-Dimensional Visualization of Cerebral Microvasculature

Adrian Bahani^{1,2}, Mathew Loren^{1,2}, Christian Crouzet^{1,2}, Vitaly Vasilevko^{1,3}, and Bernard Choi^{1,2}
¹University of California, Irvine, Irvine, CA, ²Beckman Laser Institute and Medical Clinic, Irvine, CA, ³Institute for Memory Impairments and Neurological Disorders, Irvine, CA

FR-327

Measuring Accumulation Kinetics of Nanoparticles Post Traumatic Brain Injury Using DCE-MRI

Alexander Magsam¹, Hunter Miller¹, Aria Tarudji¹, and Forrest Kievit¹
¹University of Nebraska-Lincoln, Lincoln, NE

FR-328

Exploring Optical and Magnetic Properties of Novel Prussian Blue Nanocubes for Imaging and Therapy

Fiona Splaine¹, Stanislav Emelianov^{1,2}, and Kelsey Kubelick¹
¹Georgia Institute of Technology & Emory University, Atlanta, GA, ²Georgia Institute of Technology, Atlanta, GA

FR-329

Radiopacity Optimization of a Novel Liquid Embolic

April Huckleberry¹, James Gilbert¹, William Merritt¹, and Timothy Becker¹
¹Northern Arizona University, Flagstaff, AZ

FR-330

Surface Functionalization of ICG-encapsulated PNIPAM Nanoparticles for Molecular Ultrasound-switchable Fluorescence Imaging

Yang Liu¹, Shuai Yu¹, Tingfeng Yao¹, Ruilin Liu¹, Kytai Nguyen¹, Yi Hong¹, and Baohong Yuan¹
¹The University of Texas at Arlington, Arlington, TX

FR-331

Novel NIR-II Molecular Probe as Contrast Agent for Photoacoustic Imaging

Vadakkancheril Jisha¹, Heechul Yoon¹, Donald VanderLaan¹, and Stanislav Emelianov^{1,2}
¹Georgia Institute of Technology, Atlanta, GA, ²Emory University School of Medicine, Atlanta, GA

Track: Biomedical Imaging and Instrumentation**Biomedical Imaging and Instrumentation—Other/Non-specified**

FR-332

Removing Problematic Reflection Artifacts from Photoacoustic Images Using Deep Neural Networks

Derek Allman¹ and Muyinatu Bell¹
¹Johns Hopkins University, Baltimore, MD

FR-333

Automated Artifact Detection for Large Physiological Waveform Database

Teshaun Francis¹, Balagangadhar Totapally², and Wei-Chiang Lin¹
¹Florida International University, Miami, FL, ²Nicklaus Children's Hospital, Miami, FL

FR-334

Health Wearable Devices for Patients with Obesity

Wei-Chiang Lin¹, Tananant Boonya-ananta¹, Andres Rodriguez¹, and Jessica Ramella-Roman¹
¹Florida International University, Miami, FL

FR-335

Integrating Light-Sheet Imaging with Interactive Virtual Reality to Recapitulate Cardiac Mechanics and Physiology

Chih-Chiang Chang¹, Yichen Ding¹, Arash Abiri², Parinaz Abiri¹, Kyung In Baek¹, Rene Packard¹, and Tzung Hsiai¹
¹UCLA, Los Angeles, CA, ²UCI, Irvine, CA

FR-336

Development of Classifier Models for Pore Size Characterization Via Atomic Force Microscopy Analysis

Huong Chau¹, Maryam Mobed-Miremadi¹, Unyoung Kim¹, and Richard Barber¹
¹Santa Clara University, Santa Clara, CA

FR-337

Design, Development, and Evaluation of a Remoldable, Jammable Orthosis to Improve Distal Radius Fracture Management

Gabrielle Allred¹, Tara Blair¹, Victoria Chen¹, Anders Gould¹, Shipra Khatri¹, Joshua Liu¹, Ronak Mahatme¹, Nikhil Murty¹, Emma Headley¹, Michelle Zwernemann¹, Jason Hammond², and Amir Manbachi¹
¹Johns Hopkins University, Baltimore, MD, ²MedStar Union Memorial Hospital, Baltimore, MD

FR-338

Experimental Characterization of Valve Behavior in Hydrocephalus Shunts

Dante Navarro¹, Daphne Schlesinger¹, Ryan Najmi¹, Vinay Ayyappan¹, Walter Zhao¹, Helen Wiegand¹, Shayam Hemmati¹, Anneka Kleine¹, Collyn Heier¹, Mark Luciano¹, and Amir Manbachi¹
¹Johns Hopkins University, Baltimore, MD

FR-339

Design and Development of an Automated Method of Calculating Parameters from Spinal Radiographs

Jacob Wei¹, Amir Manbachi¹, Dan Sciuabba¹, and Ali Ahmed¹
¹Johns Hopkins University, Baltimore, MD

Track: Respiratory Bioengineering

Respiratory Bioengineering-Other/Non-specified

FR-340

A Comparison of the Viscosities of Thickened Liquids for Pediatric Dysphagia

Morgan Tarlton¹, Mekale Clifton¹, Erica Heinsohn¹, Mary Ewing¹, and Ranjith Wijesinghe¹
¹Ball State University, Muncie, IN

FR-341

Investigating T Cell Migration in Chronic Obstructive Pulmonary Disease Using a Microfluidic Device

Xiaoou Ren¹, Jiandong Wu¹, and Francis Lin¹
¹University of Manitoba, Winnipeg, MB, Canada

FR-342

Engineering Human Airway Models to Study Liquid Delivery in the Lungs

Antonio Copploe¹ and Hossein Taviana¹
¹University of Akron, Akron, OH

FR-343

Toxicity Assessment of Byproducts Resulted from the Incineration of Nanoclay Composites Used in Food Packaging

Alixandra Wagner¹, Andrew White¹, Man Chio Tang¹, Sushant Agarwal¹, Todd A. Stueckle², Yon Rojanasakul¹, Rakesh Gupta¹, and Cerasela Zoica Dinu¹
¹West Virginia University, Morgantown, WV, ²National Institute for Occupational Safety and Health, Morgantown, WV

Track: Respiratory Bioengineering

Modeling of the Respiratory System

FR-344

A Markov Chain Model of Particle Deposition in the Airway Tree

Adam Sonnenberg¹ and Bela Suki¹
¹Boston University, Boston, MA

FR-345

Effect of Gravity on the Split of Liquid Plug at Pulmonary Bifurcation

Hideki Fujioka¹, Francesco Romano², Metin Muradoglu³, and James Grotberg²
¹Tulane University, New Orleans, LA, ²University of Michigan, Ann Arbor, MI, ³Koc University, Istanbul, Turkey

FR-346

Effects of Parenchymal Interdependence on Lung Derecruitment During Mechanical Ventilation

Jacob Herrmann¹, Merryn Tawhai², Jason Bates³, and David Kaczka¹
¹University of Iowa, Iowa City, IA, ²University of Auckland, Auckland, New Zealand, ³University of Vermont, Burlington, VT

FR-347

Fluid-Structure Interaction Simulations of the Biomechanics of Otitis Media and the Eustachian Tube

Justo Torres-Rodriguez¹ and Samir Ghadiali¹
¹The Ohio State University, Columbus, OH

FR-348

Using Marangoni Flows to Enhance Drug Delivery to the Eustachian Tube Orifice

Jennifer Malik¹, Samir Ghadiali¹, and Kai Zhao²
¹The Ohio State University, Columbus, OH, ²The Eye and Ear Institute, Columbus, OH

FR-349

Computational Modeling of Cough and Mucus Clearance in Patients with Total Laryngectomy Under Expiratory Muscle Strength Training

Nadun Kuruppumullage¹ and Olusegun Ilegbusi¹
¹University of Central Florida, ORLANDO, FL

FR-350

A Tissue Chip Model Mimicking Pulmonary Sarcoidosis, A Rare Lung Disease

Snehal Raut¹, Behnaz Lahooti¹, Ali Keshavarz¹, Taslim Al-Hilal¹, and Fakhrol Ahsan¹
¹Texas Tech University Health Sciences Center, Amarillo, TX

FR-351

Microfluidics Based Small Airway Model to Model Lung Diseases

Dylan Gordon¹, Justin Anderson², Dustin Haithcock¹, Zhongyu Liu², Stephen Mackay², B. Prabhakar Pandian¹, Kapil Pant¹, Jennifer Guimbellot^{2,3}, and Steven Rowe²
¹CFD Research Corporation, Huntsville, AL, ²University of Alabama at Birmingham, Birmingham, AL, ³Division of Pulmonary and Sleep Medicine, Birmingham, AL

Friday, October 19 | 9:30 am–5:00 pm | GWCC Exhibit Hall

Poster Viewing with Authors & Refreshment Break | 9:30 am–10:15 am and 2:45 pm–3:30 pm

FR-352

Effects of Soluble Surfactant on Plug Propagation and Rupture in Airways

Metin Muradoglu¹, Francesco Romano², Hideki Fujioka³, and James Grotberg²
¹Koc University, Istanbul, Turkey, ²University of Michigan, Ann Arbor, MI, ³Tulane University, New Orleans, LA

FR-353

CFD Model of Airway Closure

Francesco Romanò¹, Hideki Fujioka², Metin Muradoglu³, and James Grotberg¹
¹University of Michigan, Ann Arbor, MI, ²Tulane University, New Orleans, LA, ³Koc University, Sariyer/Istanbul, Turkey

FR-354

Transport Dynamics of Inhaled Chemotherapeutic Particles in a Human Respiratory System using an LES Model

Jianan Zhao¹, Yu Feng¹, Shirui Mao², and Peifeng Lin³
¹Oklahoma State University, Stillwater, OK, ²Shenyang Pharmaceutical University, Shenyang, China, People's Republic of, ³Zhejiang Sci-Tech University, Hangzhou, China, People's Republic of

FR-355

Deposition and Replication of Low-Strain Influenza a Virus in the Epithelium of a Human Upper Airway

Ahmadreza Haghnegahdar¹ and Yu Feng¹
¹Oklahoma State University, Stillwater, OK

Track: Respiratory Bioengineering, Translational Biomedical Engineering

Translational Respiratory Engineering

FR-356

Computational Assessment of a Neuromorphic Closed-Loop Controller for Ventilatory Pacing

Ricardo Siu¹, James Abbas², Brian Hillen¹, and Ranu Jung¹
¹Florida International University, Miami, FL, ²Arizona State University, Tempe, AZ

Track: Drug Delivery & Intelligent Systems, Respiratory Bioengineering

Respiratory Drug Delivery

FR-357

Simulations of Surfactant Replacement Therapy in Rats, Pigs, and Humans

Alireza Kazemi Taskooh¹, Daniel Isabey², Bruno Louis², Gary F. Nieman³, Louis A. Gatto³, James B. Grotberg⁴, and Marcel Filoche^{1,5}
¹Ecole Polytechnique, Palaiseau, France, ²Institut Mondor de Recherche Biomédicale, Créteil, France, ³Upstate Medical University Syracuse, New York, NY, ⁴University of Michigan, Ann Arbor, MI, ⁵Equipe ¹³, Institut Mondor de Recherche Biomédicale, ERL CNRS Université Paris-Est, Créteil, France

Track: Respiratory Bioengineering

Respiratory Mechanobiology

FR-358

MicroRNA-155 Modulates Cytoskeletal Mechanics and Prevents Epithelial Cell Injury during Cyclic Airway Reopening

Vasudha Shukla¹, Christopher Chang¹, Christopher Bobba¹, Natalia Higuera-Castro¹, and Samir Ghadiali¹
¹The Ohio State University, Columbus, OH

FR-359

The Role of Cellular Senescence In Experimental Ventilator-Induced Lung Injury

Franck Kamga Gninzeko¹, Michael Valentine¹, Sahil Chindal¹, and Rebecca Heise¹
¹Virginia Commonwealth University, Richmond, VA

FR-360

Macrophage-Epithelial Interactions Modulate Atelectrauma and Cell Injury During Cyclic Airway Reopening

Tricia Oyster¹, Chris Bobba¹, Joshua Englert¹, and Samir Ghadiali¹
¹Ohio State University, Columbus, OH

FR-361

Phenotypic Alterations in Pericyte Lineages During Murine Lung Fibrosis

Riley Hannan¹, Shayn Peirce-Cottler¹, and Thomas Barker¹
¹University of Virginia, Charlottesville, VA

Track: Biomechanics, Respiratory Bioengineering

Mechanics of the Respiratory System

FR-362

Fluid-Structure Interaction Simulations and Experiments of Airflow Limitation in Models of Obstructive Sleep Apnea

Guilherme Garcia¹, Masoud Moghaddam¹, and Trung Le¹
¹Marquette University & The Medical College of Wisconsin Milwaukee, WI

FR-363

Feasibility Assessment of Simultaneous Puff and Chest Belt Monitoring to Better Understand Tobacco Product Inhalation Patterns

Shehan Jayasekera¹, Risa Robinson¹, and Edward Hensel, Jr¹
¹Rochester Institute of Technology, Rochester, NY

FR-364

Device for the Detection of Distal Tracheal Pressure

Ronil Vaghjiani¹, Vinh Dao¹, Virang Kumar¹, Nilan Vaghjiani¹, Michael Davis¹, and Ding-Yu Fei¹
¹Virginia Commonwealth University, Richmond, VA

FR-365

A Novel Approach to Measure Low-frequency Respiratory Impedance During Variable Ventilation

Samer Bou Jawde¹, Bradford Smith², Jason Bates³, Kenneth Lutchen¹, and Bela Suki¹
¹Boston University, Boston, MA, ²University of Colorado Denver, Denver, DE, ³University of Vermont, Burlington, VT

FR-366

A Computational Analysis of Lung Airways as Adaptive NetworkIsrar Bin M Ibrahim¹ and Ramana Pidaparti¹
¹University of Georgia, Athens, GA**Track: Biomechanics, Cardiovascular Engineering****Mechanobiology of Cardiac and Smooth Muscle**

FR-367

Dependence of Cardiac Mechanotransduction Responses on Systolic versus Diastolic Loading in Engineered Heart TissuesLorenzo Sewanan¹, Lucinda Peng¹, and Stuart Campbell¹
¹Yale University, New Haven, CT

FR-368

Regulation of Cardiomyocytes Differentiation by Geometry of Patterned Cell ClusterTae Yoon Kwon¹, Eun Min Ko¹, Young Bin Cho¹, Dong Min Kim¹, Ung Hyun Ko¹, and Jennifer Hyunjong Shin¹
¹Korea Advanced Institute of Science and Technology (KAIST), Daejeon, Korea, Republic of**Track: Cardiovascular Engineering****Angiogenesis and Engineered Vascularization**

FR-369

Antiplatelet Peptide-Conjugated Glycosaminoglycan Recruits Endothelial Cells for Vascular RegenerationEmily Misnick¹ and Alyssa Panitch¹
¹University of California, Davis, Davis, CA

FR-370

Nanoparticles As Therapeutic Carriers For Gene Therapy To Treat Peripheral Arterial DiseasePriyanka Iyer¹, Linda Noukeu^{1,2}, Subhash Banerjee^{2,3}, Connie Hsia⁴, and Kytai Nguyen^{1,2}
¹University of Texas at Arlington, Arlington, TX, ²Joint Biomedical Program, UT Southwestern, Dallas, TX, ³Division of Cardiology, UT Southwestern Medical Center, Dallas, TX, ⁴Department of Internal Medicine, UT Southwestern Medical Center, Dallas, TX

FR-371

Erythropoietin (Epo)/EpoR-loaded Nanoparticles for the Treatment of Peripheral Arterial DiseaseJoseph Wolf^{1,2}, Linda Noukeu^{1,2}, Subhash Banerjee^{2,3}, Liping Tang^{1,2}, Connie Hsia⁴, and Kytai Nguyen^{1,2}
¹University of Texas at Arlington, Arlington, TX, ²Joint Biomedical Program, UT Southwestern, Dallas, TX, ³Division of Cardiology, UT Southwestern Medical Center, Dallas, TX, ⁴Department of Internal Medicine, UT Southwestern Medical Center, Dallas, TX

FR-372

Directly Reprogramming Human Dermal Fibroblasts into Functional Endothelial Cells via the Overexpression of ETV2 and Sox17Alexander Grath¹ and Guohao Dai¹
¹Northeastern University, Boston, MA

FR-373

Early Vascular Cells Improve Microvascularization Within 3D Cardiac SpheroidsIsaree Pitaktong¹, Gunnar Mattson¹, Cecillia Lui², Justin Lowenthal¹, Yang Bai², Enoch Yeung², Chin Siang Ong², Sharon Gerecht¹, and Narutoshi Hibino²
¹Johns Hopkins University, Baltimore, MD, ²Johns Hopkins Hospital, Baltimore, MD

FR-374

Development of Vascularized Scaffolds via Endothelial:Mesenchymal Stem Cell BioprintingMarco Santoro¹, Tolulope Awoosika¹, Kirstie Coombs¹, and John Fisher¹
¹University of Maryland, college park, MD

FR-375

Pericytes Enable Effective Angiogenesis in the Presence of Pro-inflammatory SignalsTae-Yun Kang¹, Federico Bocci², Jose Onuchic², Herbert Levine², and Andre Levchenko¹
¹Yale University, New Haven, CT, ²Rice University, Houston, TX

FR-376

Circulating Monocytes Play a Direct Role in Endothelium RegenerationRandall Smith Jr.¹, Daniel Swartz², and Stelios Andreadis^{1,2}
¹University at Buffalo, Amherst, NY, ²Angiograft LLC, Buffalo, NY

FR-377

Hypoxia Regulates Cluster-Based VasculogenesisMichael Blatchley¹, Franklyn Hall¹, Songnan Wang¹, Hawley Pruitt¹, and Sharon Gerecht¹
¹Johns Hopkins University, Baltimore, MD**Track: Cardiovascular Engineering****Thrombosis and Hemostasis**

FR-378

Non-Thrombogenic, Biodegradable Elastomeric Polyurethane for Blood Contacting ApplicationsCancan Xu^{1,2}, Aneetta Kuriakose^{1,2}, Danh Truong^{1,2}, Primana Punnakitkashem^{1,2}, Kytai Nguyen^{1,2}, and Yi Hong^{1,2}
¹University of Texas at Arlington, Arlington, TX, ²the University of Texas Southwestern Medical Center at Dallas, Dallas, TX

FR-379

Updating Poiseuille: A Relational Description of Blood Cell Motions During FlowVinay Bhal¹, Abdullah Bahour¹, Chelsey Chen², Jerome Goldstein¹, and Eugene Eckstein¹
¹University of Memphis, Memphis, TN, ²St. Mary's Episcopal School, Memphis, TN

FR-380

Elucidation of the Platelet-Endothelium Interface Using an *In Vitro* Microfluidic Flow Chamber

Daniel E. Sallee¹, Jenya Zilberman-Rudenko¹, Stephanie E. Reitsma¹, Toshiaki Shirai¹, Peter C. Searson², and Owen J.T. McCarty¹
¹Oregon Health & Science University, Portland, OR, ²Johns Hopkins University, Baltimore, MA

FR-381

Elucidation of the Role GPVI in Platelet Adhesion and Activation by Nidogen

Daniel E. Sallee¹, Annachiara Mitrugno¹, Ayesha Khader¹, Anh T.P. Ngo¹, Jiaqing Pang¹, and Owen J.T. McCarty¹
¹Oregon Health & Science University, Portland, OR

FR-382

Establishing the Transient Mass Balance of Thrombosis: From Tissue Factor to Thrombin to Fibrin under Venous Flow

Shu Zhu¹, Jason Chen¹, and Scott L. Diamond¹
¹University of Pennsylvania, Philadelphia, PA

FR-383

Inhibition of Arterial Thrombosis by Charged Nanoparticles

Michael Griffin¹ and David Ku¹
¹Georgia Institute of Technology, Atlanta, GA

FR-384

The Opposite Effects of Mechanical Circulatory Assist Devices on Platelet Hemostatic Function Towards Thrombosis and Bleeding

Zengsheng Chen¹, Jiafeng Zhang¹, Kareem Kafayat¹, Xiaoyan Liu¹, Tieluo Li¹, Bartley Griffith¹, and Zhongjun Wu^{1,2}
¹University of Maryland Baltimore, Baltimore, MD, ²University of Maryland, College Park, College Park, MD

FR-385

Assessment of Vascular Graft Technologies by Correlating Luminal Volume to Thrombus Components using MicroCT

Deirdre Anderson¹, Avi Gupta¹, and Monica Hinds¹
¹Oregon Health & Science University, Portland, OR

Track: Cardiovascular Engineering, Tissue Engineering

Cardiovascular Tissue Engineering

FR-386

Electrospun Polycaprolactone-Based Patches for Enhancing Cardiac Progenitor Cell Reporative Potential

Benjamin Streeter¹, Jiajia Xue¹, Younan Xia¹, and Michael Davis¹
¹Wallace H. Coulter Department of Biomedical Engineering, Emory University and Georgia Institute of Technology, Atlanta, GA

FR-387

Structural and Functional Maturation of p53-Stabilized iPS-CMs in Biomimetic Cardiac Tissue Model

Jessica Miller¹, Aaron Rogers¹, Nikhil Mardhekar¹, Jianyi Zhang¹, Palaniappan Sethu¹, and Ramaswamy Kannappan¹
¹University of Alabama, Birmingham, AL

FR-388

Stent Neo-Intimal Formation in Tissue Engineered Vessel

Cameron Pinnock¹ and Mai Lam¹
¹Wayne State University, Detroit, MI

FR-389

Three-dimensional ECM Mimic Cardiac Patches for the Aaturation of Pluripotent Stem Cell Derived Cardiomyocyte

Viola Morris¹, Seongho Bae¹, Matthew Huang¹, and Young-sup Yoon¹
¹Emory University, Atlanta, GA

FR-390

Design of a Biaxial Mechanobioreactor for Engineering Aortic Pediatric Valves

Edwin Wong^{1,2} and Craig Simmons^{1,2}
¹University of Toronto, Toronto, ON, Canada, ²Ted Rogers Centre for Heart Research, Toronto, ON, Canada

FR-391

Cardiomyocyte Shape Control Improves Contractility Tests in Drug Screening Applications

Trong Shen¹, Gyu-Tae Kim¹, Yousef Shafieyan¹, and Boris Hinz¹
¹University of Toronto, Toronto, ON, Canada

FR-392

Tri-layered and Gel-like Nanofibrous Scaffolds with Native-like Anisotropic Features for Engineering Heart Valve Leaflets

Shaohua Wu¹, Jonathan Butcher², Jung Yul Lim³, and Bin Duan¹
¹University of Nebraska Medical Center, Omaha, NE, ²Cornell University, Ithaca, NY, ³University of Nebraska, Lincoln, Lincoln, NE

FR-393

Differentiation of Adipose Derived Stem Cells into Endothelial Cells for Pulmonary Valve Re-endothelialization

Margarita Portilla¹, Erica Brophy¹, and Dan Simionescu¹
¹Clemson University, Clemson, SC

FR-394

Analyzing Remodeling within Diabetic Renal Vasculature

David Pollard¹ and Agneta Simionescu¹
¹Clemson University, Clemson, SC

FR-395

Fabrication and Tensile Testing of Tubular Nanofibrous Gelatin-based Scaffolds for Artificial Blood Vessels

Amanda Kennell MS¹, Anna Krum¹, and Andrei Stanishevsky PhD¹
¹University of Alabama in Birmingham, Birmingham, AL

FR-396

Self-endothelializing Off-the-shelf Vascular Grafts in a Growing Animal Model

Bitu Nasiri¹, Sindhu Row¹, Stelios Andreadis¹, and Daniel Swartz²
¹University at Buffalo, Buffalo, NY, ²Angiograft LLC, Buffalo, NY

FR-397

Exosomes in Cardiac Tissue EngineeringSpencer Marsh¹ and Agneta Simionescu¹
¹Clemson University, Clemson, SC**Track: Cardiovascular Engineering, Biomechanics****Cardiovascular Biomechanics**

FR-398

A Triple Imaging Modality-Based Inverse Approach to Determine Right Ventricular Wall MechanicsManuel Rausch¹, Marcin Malinowski², Tomasz Jazwiec², and Tomasz Timek²
¹University of Texas at Austin, Austin, TX, ²Spectrum Health, Grand Rapids, MI

FR-399

Investigating Cell Proliferation in a 3D In Vitro Model of Valve DiseaseJonathan Bramsen¹, Bridget Alber¹, Sudip Dahal¹, Bruce Murray¹, Peter Huang¹, and Gretchen Mahler¹
¹Binghamton University, Vestal, NY

FR-400

Regulation of Mesenteric Lymphatic Pump Function by DopamineRebecca C. Harlow¹, Joshua K. Meisner², and Ranjeet M. Dongaonkar¹
¹Michael E DeBakey Institute, Texas A&M University, College Station, TX, ²University of Michigan, Ann Arbor, MI

FR-401

Quantification of the Regional Differences in Atrioventricular Heart Valve Mechanical FunctionDevin Laurence¹, Samuel Jett¹, Anju Babu², Ryan Baumwart³, Yi Wu¹, and Chung-Hao Lee^{1,4}
¹The University of Oklahoma, Norman, OK, ²National Institute of Technology, Rourkela, India, ³Oklahoma State University, Stillwater, OK, ⁴Institute for Biomedical Engineering, Science, and Technology, Norman, OK

FR-402

Utilizing Light-Sheet Microscopy to Visualize the Effects of Biomechanical Forces on Cardiac LoopingJeffrey Lam¹, Cynthia Chen¹, Manin Chou¹, Jennifer Wang¹, Shivani Subhedar¹, Junjie Chen¹, Jeff Hsu¹, and Tzung Hsiai¹
¹UCLA, Los Angeles, CA

FR-403

Alterations in Biomechanical Properties of Aortic Wall in a Mouse Model of Marfan SyndromeNazli Gharraee¹, Joseph Swisher¹, and Susan Lessner¹
¹University of South Carolina, Columbia, SC

FR-404

Novel Surface Plasmon Resonance Model for Monitoring Heart Cells Contractility In Real TimeMaedeh Mozneb¹ and Chen-Zhong Li¹
¹Florida International University, Miami, FL

FR-405

Fluid-structure Interaction Analysis of Reduced Leaflet Motion Due to Leaflet Thrombosis After Transcatheter Aortic Valve ReplacementWenbin Mao¹, Andres Caballero¹, and Wei Sun¹
¹Georgia Institute of Technology, Atlanta, GA

FR-406

Modeling Ventricular-arterial Interaction Using a Multi-organ Finite Element ModelSheikh Mohammad Shavik¹, Zhenxiang Jiang¹, Seungik Baek¹, and Lik Chuan Lee¹
¹Michigan State University, East Lansing, MI

FR-407

Interfacing Displacement Analysis of Myocardial Mechanical Deformation to Uncover Segmental Susceptibility to Doxorubicin-Induced Injury and RegenerationJunjie Chen¹, Yichen Ding², Cynthia Chen¹, Chadi Nahal¹, Michael Chen¹, Sally Tu¹, Tzung Hsiai^{1,2,3}, and Rene Packard^{2,4,5}
¹Department of Bioengineering, University of California, Los Angeles, Los Angeles, CA, ²David Geffen School of Medicine, University of California, Los Angeles, Los Angeles, CA, ³Veterans Affairs West Los Angeles Medical Center, Los Angeles, CA, ⁴Ronald Reagan UCLA Medical Center, Los Angeles, CA, ⁵Veterans Affairs West Los Angeles Medical Center, Los Angeles, CA

FR-408

Investigations of the Mechanical Properties of Chordae Tendineae of the Mitral and Tricuspid Heart ValvesColton Ross¹, Ryan Baumwart², Yi Wu¹, and Chung-Hao Lee¹
¹The University of Oklahoma, Norman, OK, ²Oklahoma State University, Stillwater, OK

FR-409

Computational Modeling of Pulmonary Valve Deformation Using a Machine Learning-based 3-D Geometry Reconstruction from Computed Tomography ImagesTongran Qin¹, Wenbin Mao¹, Liang Liang¹, and Wei Sun¹
¹Georgia Institute of Technology, Atlanta, GA

FR-410

Chemogenetic Chronic Activation of Hypothalamic Oxytocin Neurons Confers Cardioprotection During Chronic Intermittent HypoxiaJeannette Rodriguez Gonzalez¹, Mary Kate Dwyer¹, John Schloen¹, Jhansi Dyavanapalli¹, David Mendelowitz¹, and Matthew Kay¹
¹The George Washington University, Washington, DC

FR-411

Extracellular Matrix Properties in Patients Undergoing LVAD ImplantationNicolas Gallo¹, Gene Kim², Nir Uriel², John Georgiadis^{1,3}, and Marcella Vaicik^{1,4}
¹Illinois Institute of Technology, Chicago, IL, ²University of Chicago, Chicago, IL, ³University of Illinois, Urbana Champaign, IL, ⁴Department of Veteran Affairs, Hines, IL

FR-412

A New Pulmonary Artery Constriction Model to Investigate Right Ventricle Adaptation to Pressure Overload in Ovine

Michael Nguyen-Truong¹, June Boon¹, Joanna Dunne¹, Brad Nelson¹, Jeremiah Easley¹, Eric Monnet¹, and Zhijie Wang¹
¹Colorado State University, Fort Collins, CO

FR-413

Windkessel-Preserving Aortic Stent-Graft

Kaspars Maleckis¹, Anastasia Desyatova¹, Alexey Kamenskiy¹, Paul Aylward¹, and Jason MacTaggart¹
¹University of Nebraska Medical Center, Omaha, NE

FR-414

Finite Element Implementation of Growth Induced Three-Dimensional Residual Stress in the Aortic Wall

Haofei Liu¹, Ming Zhang¹, Minliang Liu², Caitlin Martin², Zongxi Cai¹, and Wei Sun²
¹Tianjin University, Tianjin, China, People's Republic of
²Georgia Institute of Technology, Atlanta, GA

FR-415

Instrumentation of the Mouse Carotid Artery with a Blood Flow-modifying Cuff Induces Low Vessel Wall Strain

Caleb C. Berggren¹, Miten B. Patel², Fotios Savvopoulos², Rob Krams³, and Ryan M. Pedrigi⁴
¹University of Nebraska-Lincoln, Lincoln, NE, ²Imperial College London, London, United Kingdom, ³Queen Mary University London, London, United Kingdom, ⁴University of Nebraska-Lincoln, Lincoln, NE

FR-416

Cholesterol and Substrate Stiffness Coordinate to Regulate Mechanics of Vascular Smooth Muscle Cells

Hanna Sanyour^{1,2}, Na Li^{1,2}, Alex Rickel^{1,2}, Courtney Kinser^{1,2}, and Zhongkui Hong^{1,2}
¹University of South Dakota, Sioux Falls, SD, ²BioSNTR, Sioux Falls, SD

FR-417

Double Helical Flow in Embryonic Cardiac Outflow Tract Aligned with Aorticopulmonary Septation

Sheldon Ho¹, Wei Xuan Chan¹, Nhan Phan-Thien¹, and Choon Hwai Yap¹
¹National University of Singapore, Singapore, Singapore

FR-418

Endodermal Strain Fields During Heart Tube Formation in the Developing Chicken Embryo

John Jackson¹, Meagan Furth¹, and Victor Varner¹
¹University of Texas at Dallas, Richardson, TX

FR-419

Investigating Mechanisms of Hypertensive Vascular Remodeling Using Partial Least Squares Regression

Alexander Caulk¹, Matthew Bersi², Jay Humphrey¹, and Kevin Janes³
¹Yale University, New Haven, CT, ²Vanderbilt University, Nashville, TN, ³University of Virginia, Charlottesville, VA

FR-420

Comparison of Erythrocyte Senescent Properties and Microfluidic High Shear Environment Damage

James Buerck¹, Dimitrios Papavassiliou¹, David Schmidtke², Trevor Snyder³, and Edgar O'Rear¹
¹University of Oklahoma, Norman, OK, ²University of Texas at Dallas, Richardson, TX, ³VADovations, Oklahoma City, OK

FR-421

Biomechanical Properties of Neonatal Porcine Septum

Sammira Rais-Rohani¹, Katherine McGrath Copeland², Jun Liao², and Lakiesha Williams¹
¹Mississippi State University, Mississippi State, MS, ²University of Texas at Arlington, Arlington, TX

FR-422

Porcine Peripheral Artery and Saphenous Vein Mechanics

Brooks Lane¹, William Torres¹, David Prim¹, Boran Zhou², Alexey Kamenskiy³, Tarek Shazly¹, and John Eberth^{1,4}
¹University of South Carolina, Columbia, SC, ²Mayo Clinic College of Medicine, Rochester, MN, ³University of Nebraska Medical Center, Omaha, NE, ⁴University of South Carolina School of Medicine, Columbia, SC

FR-423

A Patient-Specific In Vitro Setup for Transcatheter Pulmonary Valve Replacement Outcome Prediction

M Sabbir Salek¹, Natalie M Behrle², Sanket S Shah², Abhay Divekar², Masoud Farahmand¹, and Ethan Kung¹
¹Clemson University, Clemson, SC, ²The Children's Mercy Hospital, Kansas, MO

FR-424

Estimation of In Vivo Material Parameters of the Aortic Wall using Multi-phase CT Data

Minliang Liu¹, Liang Liang¹, Fatiesa Sulejmani¹, Glen Iannucci², Edward Chen², Bradley Leshnower², and Wei Sun¹
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Track: Cardiovascular Engineering, Device Technologies and Biomedical Robotics

Cardiovascular Devices

FR-425

Advanced Simulators for the Development of Drive Systems for Use in Ventricular Assist Devices

Dillon Hurd¹ and Derrick Rollins¹
¹Iowa State University, Ames, IA

FR-426

Non-Brittle and Adhesive 3D Printed Sugar-Based Stents for Surgical Anastomosis

Ali Farzin¹, Amir Miri¹, Fatemeh Sharifi¹, Negar Faramarzi¹, Arian Jaber², Azadeh Mostafavi³, Ricky Solorzano⁴, Yu Zhang¹, Ali Khademhosseini¹, and Ali Tamayol²
¹Harvard University, Cambridge, MA, ²University of Nebraska-Lincoln, LINCOLN, NE, ³University of Nebraska-Lincoln, Lincoln, NE, ⁴Allevi Inc, Philadelphia, PA

FR-427

An Exploration of Adhesion Strategies for Cardiac Support via Direct Epicardial DisplacementMolly Kaissar¹, Elaine Soohoo¹, and Dennis R. Trumble¹
¹Carnegie Mellon University, Pittsburgh, PA

FR-428

Multimodal Ex Vivo Heart Perfusion: An Avenue for Improved Graft Recovery and Functional EvaluationBryan Gellner¹, Liming Xin^{1,2}, Roberto Vanin Pinto Ribeiro^{2,3}, Ved Bissoondath², Pengzhou Lu^{1,2}, Mitchell Adamson^{2,3}, Frank Yu², Emanuela Paradiso⁴, Vivek Rao^{2,3,5}, Mitesh Badiwala^{2,5}, and Craig Simmons^{1,6}
¹Department of Mechanical & Industrial Engineering, University of Toronto, Toronto, ON, Canada, ²Division of Cardiovascular Surgery, Toronto General Hospital, University Health Network, Toronto, ON, Canada, ³Institute of Medical Science, The University of Toronto, Toronto, ON, Canada, ⁴Department of Anesthesia and Pain Management, Toronto General Hospital, University Health Network, Toronto, ON, Canada, ⁵Faculty of Medicine, The University of Toronto, Toronto, ON, Canada, ⁶Institute of Biomaterials and Biomedical Engineering, The University of Toronto, Toronto, ON, Canada

FR-429

Heart-Ventricular Stroke Volume Assessment using Non-Invasive Skin Patch SensorFayez Alruwaili¹, Kim Cluff², Jacob Griffith¹, Ryan Becker¹, and J Patterson¹
¹Wichita State University, Wichita, KS, ²Wichita State University, Wichita, KS

FR-430

Multiparametric Slice Culture Platform for the Investigation of Human Cardiac PhysiologyRose Yin¹, Yun Qiao¹, Quan Dong¹, Baichen Li¹, Sofian Obaid¹, Zhenyu Li¹, and Igor Efimov¹
¹The George Washington University, Washington DC, DC

FR-431

A Novel Sensorless Rotational Speed-based Control System for Continuous Flow Left Ventricular Assist DevicesYu Wang¹, Moustafa Meki², Palaniappan Sethu³, Ayman El-Baz², and Guruprasad Giridharan²
¹Dalian University of Technology, Liaoning, China, People's Republic of, ²University of Louisville, Louisville, KY, ³University of Alabama at Birmingham, Birmingham, AL

FR-432

Self-Adaptive 3D-Printed RV-PA Conduits for PediatricsOzan Erol¹, Emilio Bachtiar¹, Narutoshi Hibino¹, Lewis Romer¹, David H. Gracias¹, and Sung Hoon Kang¹
¹Johns Hopkins University, Baltimore, MD

FR-433

Nitric Oxide Releasing Bionanomatrix Coating for Left Atrial Appendage Occlusion Devices to Improve HealingPratheek Bobba¹, Reid Millican², Patrick Hwang², Brigitta Brott^{1,2}, Dong-Ming Hou³, and Ho-Wook Jun^{1,2}
¹University of Alabama at Birmingham, Birmingham, AL, ²Endomimetics, LLC, Birmingham, AL, ³Boston Scientific, Maple Grove, MI

FR-434

Rotary Pump Speed Modulation to Produce Pulsatile Flow and Phasic Ventricular Volume UnloadingConnor Smith¹, Michael Sobieski¹, Gretel Monreal¹, Todd Adams¹, Kevin Soucy¹, Michele Gallo¹, William Whited¹, Adam Kohl¹, Mark Slaughter¹, and Steven Koenig¹
¹University of Louisville, Louisville, KY

FR-435

Novel Mitral Annuloplasty Ring for Improved Suture DynamicsBeatrice Ncho¹, Eric Pierce¹, Charles Bloodworth IV¹, Akito Imai², Keitaro Okamoto², Yoshiaki Saito², Robert Gorman², Joseph Gorman III², and Ajit Yoganathan¹
¹Georgia Institute of Technology, Atlanta, GA, ²University of Pennsylvania, Philadelphia, PA

FR-436

CFD Modeling for Evaluation of the Chemofilter Device PerformanceNazanin Maani¹, Steven Hetts², and Vitaliy Rayz¹
¹Purdue University, West Lafayette, IN, ²UCSF, San Francisco, CA

FR-437

A Novel Method for Arterial Occlusion in Porcine Angiogenesis StudiesKarl Marback¹ and Daniel Fischer²
¹Yale University, Royal Oak, MI, ²Yale University, New York, NY

FR-438

A Universal Sealant to Reduce Paravalvular Leakage in Transcatheter Aortic ValvesNgoc Nguyen¹, Vy Nguyen¹, Yen Nguyen¹, and Alessandro Bellofiore¹
¹San Jose State University, San Jose State University, CA

FR-439

Simulation Study of Improvement in Centrifugal Blood Pump Performance Through the Use of Superhydrophobic SurfacesVivek Vasudevan¹, Wei Xuan Chan¹, Adriel Jia Jun Low¹, Venkatesan¹, and Choon-Hwai Yap¹
¹National University of Singapore, Singapore, Singapore

FR-440

Study of the Bioeffects Caused by Ultrasound Application in Perfused Rat HeartOlivia C. Coiado¹
¹Carle Illinois College of Medicine, University of Illinois at Urbana-Champaign, Champaign, IL

FR-441

Platform for Developing Nitric Oxide Eluting StentsBrittney Severino¹, Kagya Amoako¹, and Saleem Ibrahim¹
¹University of New Haven, West Haven, CT

FR-442

Prohealing Multifunctional Nanomatrix Coated Stent Evaluation in a Rabbit Iliac Artery Balloon Injury ModelXixi Zhang¹, Grant Alexander¹, Patrick Hwang¹, Jun Chen¹, Brigitta Brott¹, Peter Anderson¹, Young-Sup Yoon², and Ho-Wook Jun¹
¹University of Alabama at Birmingham, Birmingham, AL, ²Emory University, Atlanta, GA

Friday, October 19 | 9:30 am–5:00 pm | GWCC Exhibit Hall

Poster Viewing with Authors & Refreshment Break | 9:30 am–10:15 am and 2:45 pm–3:30 pm

FR-443

High-Throughput Drug-Screening Using Human Cardiomyocytes in Mechanically Controlled EnvironmentsGyu-Tae Kim¹, Yousef Shafieyan¹, Trong Shen¹, Julia Plakhotnik¹, Jason Maynes¹, and Boris Hinz¹¹University of Toronto, Toronto, ON, Canada

FR-444

Balloon Fracturing of Small Sized Bioprosthetic Aortic Valves Before Valve-in-Valve TherapyPeter Johansen¹, Henrik Engholt¹, Mariann Tang², and Jens Erik Nielsen-Kudsk³¹Aarhus University, Aarhus N., Denmark, ²Aarhus University Hospital, Aarhus N, Denmark, ³Aarhus University Hospital, Aarhus N., Denmark**Track: Cardiovascular Engineering, Stem Cell Engineering****Cardiovascular Regeneration and Stem Cells**

FR-445

Engineering Patient-Specific Endothelial Cells for Peripheral Artery Disease Modeling and Vascular RegenerationBin Jiang¹, Xinlong Wang¹, Chongwen Duan¹, Melina Kibbe², and Guillermo Ameer^{1,2}¹Northwestern University, Evanston, IL, ²Northwestern University, Chicago, IL

FR-446

Generation and Characterization of Stem Cell Derived Smooth Muscle Cells for Elastic Matrix RegenerationSrikanth Sivaraman¹, Anand Ramamurthi², and Raj Rao¹¹University of Arkansas, Fayetteville, Fayetteville, AR, ²Cleveland Clinic, Cleveland, OH

FR-447

Stem Cell-based Co-culture System using Hydrogel Scaffolds Incorporating Nanofibers for Cardiovascular Tissue RegenerationYun-Min Kook¹, Hyerim Kim², Min Hee Park², Kangwon Lee², and Won-Gun Koh¹¹Yonsei University, Seoul, Korea, Republic of,²Seoul National University, Seoul, Korea, Republic of

FR-448

Modulation of ZIC3 Expression in Pluripotent Stem Cells using CRISPR-interference to Model HeterotaxyRoberta Lock¹, Bohao Liu¹, Gordana Vunjak-Novakovic¹, and Barry Fine¹¹Columbia University, New York, NY

FR-449

Adipose Stem Cell Conditioned Medium Promotes Recovery of hiPSC Derived Cardiomyocytes in an *In Vitro* Transplantation ModelBradley Ellis¹, Dmitry Traktuev², Uryan Isik Can¹, Stephanie Merfeld-Clauss², Keith March², and Pinar Zorlutuna¹¹University of Notre Dame, Notre Dame, IN, ²University of Florida, Gainesville, FL

FR-450

Tissue Engineering the Cardiac Pacemaker with Small MoleculesAndrew Hunter¹, Yunkai Dai², Kemar Brown³, and Ann Foley¹¹Clemson, Charleston, SC, ²Clemson University, Charleston, SC, ³Mount Sinai, New York, NY

FR-451

Novel Peptide Combinations Capture Endothelial Colony Forming Cells Under Fluid ShearYuan Tian¹, Wen Seeto¹, and Elizabeth Lipke¹¹Auburn University, Auburn, AL

FR-452

Biomechanical Regulation of Adipose-Derived Stem Cells Differentiation into CardiomyocytesKayla Henderson¹, Nick Pattie¹, and Aaron Baker¹¹University of Texas at Austin, Austin, TX

FR-453

Response of Human Mesenchymal Stem Cells to Physiologically Modeled Mechanical Stimuli & Mimicking Variable Cardiac Output in Tissue-Engineered Vascular GraftsMediha Gurel¹ and Peter Mcfetridge¹¹University of Florida, Gainesville, FL

FR-454

Variants in a Non-coding Genomic Locus Induce Functional Deficits in iPSC-derived Endothelial CellsEvan Teng¹, Jesse Placone¹, Aditya Kumar¹, Brenda Ngo¹, Jessica Fung¹, Kristin Baldwin², and Adam J Engler^{1,3}¹UC San Diego, La Jolla, CA, ²The Scripps Research Institute, La Jolla, CA, ³Sanford Consortium for Regenerative Medicine, La Jolla, CA

FR-455

The Paracrine Role of Human Adult Cardiomyocytes on the Cardiomyogenic Evolution of Human BM-MSC within 3D Collagenous Niche in Healthy and Inflamed ConditionsJyotsna Joshi¹ and Chandra Kothapalli¹¹Cleveland State University, Cleveland, OH

FR-456

Micropatterning Human Induced Pluripotent Stem Cells to Promote Cardiac DifferentiationNathan Cho¹, Joycelyn K. Yip¹, Megan L. Rexius-Hall¹, and Megan L. McCain^{1,2}¹Laboratory for Living Systems Engineering, Department of Biomedical Engineering, USC Viterbi School of Engineering, University of Southern California, Los Angeles, CA, ²Department of Stem Cell Biology and Regenerative Medicine, Keck School of Medicine at USC, University of Southern California, Los Angeles, CA

FR-457

Keratose Hydrogels Trigger Vascular Smooth Muscle Differentiation from Human Cardiac Stem Cells via TGF- β 1 Signaling PathwayBenjamin Ledford¹, Jamelle Simmons¹, Miao Chen¹, Catherine Barron¹,Ena Tovillo¹, Aurora Cartaya¹, Mark Van Dyke¹, and Jia-Qiang He¹¹Virginia Tech, Blacksburg, VA

FR-458

μFLISA: A New Experimental and Computational Platform for Analysis of Dynamic SecretomesKshitiz^{1,2}, David Ellison³, Yasir Suhail², Junaid Afzal⁴, Jeffrey Spees⁵, and Andre Levchenko⁶¹University of Connecticut Health Center, Farmington, CT,²Yale University, West Hartford, CT, ³Johns Hopkins Medical Institutions, Baltimore, MD, ⁴University of California San Francisco, San Francisco, CA, ⁵University of Vermont, Burlington, VT, ⁶Yale University, West Haven, CT**Track: Cardiovascular Engineering****Cardiovascular Engineering-
Other/Non-specified**

FR-459

Lymphedema Causes Increased Net Lymph FlowJoshua Hall¹, Duy Nguyen¹, Alexander Smith¹, and Juan Jiménez¹¹University of Massachusetts, Amherst, MA

FR-460

Dysregulation of VEGF Signaling During Heart Tube Fusion: A Potential Driver of Congenital Heart DefectsGraham Rykiel¹, Sandra Rugonyi¹, and Brenda Rongish²¹Oregon Health and Science University, Portland, OR, ²The University of Kansas Medical Center, Kansas City, KS

FR-461

Ambient Ultra Fine Particles Exposure Impaired Gut Vascular Barrier via Notch SignalingChih-Chiang Chang¹, Kyung In Baek¹, Yichen Ding¹, Man In Chou¹, Cynthia Chen¹, Constantinos Sioutas², Rongsong Li¹, and Tzung Hsiai¹¹UCLA, Los Angeles, CA, ²University of Southern California, Los Angeles, CA

FR-462

Quantitative Characterization of a Porcine Peripheral Artery Disease Model to Test an Engineered Encapsulated Mesenchymal Stromal Cell TherapyJuline Deppen^{1,2}, Lanfang Wang², Mark Goodman³, Ronald Voll³, Deqiang Qiu³, Christopher Leatherday³, John Oshinski^{1,3}, and Rebecca Levit²¹Georgia Institute of Technology and Emory University, Atlanta, GA, ²Emory University School of Medicine, Atlanta, GA, ³Emory University, Atlanta, GA

FR-463

Identification of Attributes for Performance Assessment of Endotracheal IntubationChiho Lim¹, Sohyung Cho¹, Hoo Sang Ko¹, Ikechukwu Ohu², Henry Wang³, Babatunde Jimmy², Jordan Felice⁴, Russell Griffin⁵, and Justin Carlson^{2,6}¹Southern Illinois University Edwardsville, Edwardsville, IL, ²Gannon University, Erie, PA, ³University of Texas Health Science Center at Houston, Houston, TX, ⁴Lake Erie College of Osteopathic Medicine, Erie, PA, ⁵The American Heart Association, Dallas, TX, ⁶Saint Vincent Health System, Erie, PA

FR-464

Nanoparticle Targeting to Reverse Aortic Calcification in a Modified Mouse Model of Adenine-induced Chronic Kidney DiseaseSaketh Karamched¹, Xiaoying Wang¹, and Narendra Vyavahare¹¹Clemson University, Clemson, SC

FR-465

Development of LabVIEW® Based Visual Feedback Tool for Voluntary Control of Breathing For Investigating Role of Respiration in Autonomic Responses Evoked by Listening to MusicDibyajyoti Biswal¹ and Abhijit Patwardhan¹¹University of Kentucky, Lexington, KY**Track: Translational Biomedical Engineering****Cell Therapeutics Biomanufacturing**

FR-466

Label Free High-Content Imaging Analysis to Assess Mesenchymal Stem Cell PotencyBobby Leitmann¹, Isaac Steinmetz¹, and Luke Mortensen¹¹University of Georgia, Athens, GA

FR-467

Bifunctional RNA-nanoparticles to Enhance Dendritic Cell Activation and Enable MRI-based Detection of Dendritic Cell Migration to Lymph NodesAdam Grippin¹, Elias Sayour¹, Brandon Wummer², Tyler Wildes¹, Kyle Dyson¹, Adam Monsalve¹, Jon Dobson¹, and Duane Mitchell¹¹University of Florida College of Medicine, Gainesville, FL, ²University of Florida, Gainesville, FL

FR-468

Perfusion-Enhanced Medicinal Effects of Mesenchymal Stem Cells Using a Microfluidic PlatformAnnie Bowles^{1,2,3,4,5}, Diego Correa^{2,3,4}, and Ashutosh Agarwal^{1,2,3,5}¹Department of Biomedical Engineering, Miami, FL, ²DJTMF Biomedical Nanotechnology Institute, Miami, FL, ³Diabetes Research Institute, Miami, FL, ⁴Department of Orthopaedics, Miami, FL, ⁵Department of Pathology, Miami, FL

FR-469

Distribution of Polyacrylamide CMMPs within a 3D Spheroid MicroenvironmentRobert Gutierrez¹, Nicholas Labriola¹, and Eric Darling¹¹Brown University, Providence, RI

FR-470

Scalable and Simple 3D Culture System for Culturing Protein-Producing CellsQiang Li¹, Haishuang Lin¹, Ou Wang¹, and Yuguo Lei¹¹University of Nebraska-Lincoln, LINCOLN, NE

FR-471

Hydrogel Biochemical Properties and Stiffness Differentially Affect MSC Proliferation and SecretomeMolly Ogle¹, Gilad Doron¹, Matt Levy¹, and Johnna Temenoff¹¹Georgia Institute of Technology, Atlanta, GA

FR-472

Rolled Scaffold, a Novel Microfluidic Platform for High-Density Culture of Adherent CellAshkan YekrangSafakar¹, Katie M. Hamel¹, Jangwook P. Jung¹, and Kidong Park¹¹Louisiana State University, Baton Rouge, LA

FR-473

Comprehensive Proteomic Analysis of High Productivity CHO Cells

Danny Flanigan¹, Ningning Xu¹, Chao Ma², Kahyong Goh¹, Jianfa Ou¹, Lufang Zhou¹, and Margaret Liu¹
¹University of Alabama Birmingham, Birmingham, AL, ²The University of Alabama, Tuscaloosa, AL

Track: Cancer Technologies, Cellular and Molecular Bioengineering

Cancer Cell Motility and Migration

FR-474

Probing the Dynamics of Basement Membrane Invasion during Breast Cancer

Julie Chang¹ and Ovijit Chaudhuri¹
¹Stanford University, Stanford, CA

FR-475

Targeting Heterogeneity of Bladder Cancer by Nanobiosensing and Tumor Bioengineering

Pak Kin Wong¹, Yue Yan¹, Peter Torab¹, Ying Wan¹, Jay Raman¹, and David Degraff¹
¹The Pennsylvania State University, University Park, PA

FR-476

Reciprocal Signaling Between Myeloid Derived Suppressor Cells and Tumor Cells to Drive Cell Migration

Vasudha C. Shukla¹, Abirami Senthilvelan¹, Silvia Duarte-Sanmiguel¹, Tariq Ahmed¹, Brooke Benner¹, Samir N. Ghadiali¹, William E. Carson¹, and Daniel Gallego-Perez¹
¹The Ohio State University, Columbus, OH

FR-477

Molecular Mapping of Anti-Migratory Effects of Novel Phytochemicals Against Breast Cancer Cells

Pradip Shahi Thakuri¹, Ramila Joshi¹, Megha Gupta¹, Gary Luker², and Hossein Tavana¹
¹University of Akron, Akron, OH, ²University of Michigan, Ann Arbor, MI

FR-478

Mesenchymal-Amoeboid Transitions in Composite 3D Silk-Collagen Hydrogels

Amanda Khoo¹, Thomas Valentin¹, Susan Leggett¹, Mohak Patel¹, Elisa Bye¹, and Ian Wong¹
¹Brown University, Providence, RI

FR-479

The Tumor Suppressor Protein RASSF1A Modulates Transcriptional Activation Of NF-AT

Sarah Deng¹, Kerry McConaughay¹, Phuwadet Pasarj², Shairaz Baksh², and Joanne Pratt¹
¹Franklin W Olin College of Engineering, Needham, MA, ²University of Alberta, Edmonton, Alberta Canada T6G 2R3, Canada

FR-480

Collectivity as a New Criterion for Breast Cancer Model

Jiwon Kim¹, Youngbin Cho¹, Hyuntae Jeong¹, and Jennifer H. Shin¹
¹KAIST, Daejeon, Korea, Republic of

FR-481

Cellular Cholesterol Modulates Lung Cancer Cell Adhesion and Rolling on E-selectin

Amina Mohammadalipour¹, Christian A. Showalter¹, Harrison T. Muturi¹, Sonia M. Najjar¹, Amir M. Farnoud¹, and Monica M. Burdick¹
¹Ohio University, Athens, OH

FR-482

Epoxyeicosatrienoic Acid Angiogenic Activity is Mediated by COX-2 through Formation of Hydroxy Epoxyeicosatrienoic Acids

Anita Rajamani¹, Amy Rand², Sean Kodani¹, Todd Harris¹, Bogdan Barnych¹, Lukas Schlatt¹, Kin Sing Lee³, Anthony Passerini¹, and Bruce Hammock¹
¹University of California, Davis, Davis, CA, ²Carleton University, Ottawa, Canada, ³Michigan State University, East Lansing, MI

FR-483

TGF-β1 Acts Through Cadherin-11 To Drive an Invasive Phenotype in Glioblastoma Stem/Initiating Cells

Joseph Chen¹, Cyrene Arputhasamy¹, Kelsey Springer¹, Joseph McCarty², and Sanjay Kumar¹
¹UC Berkeley, Berkeley, CA, ²University of Texas MD Anderson Cancer Center, Houston, TX

Track: Cancer Technologies, Nano and Micro Technologies

Micro/Nano Tools for Cancer Detection, Diagnosis, or Therapy

FR-484

A Mechanistic Study of Magnetic Nanoparticle Heating

Sheng Tong¹, Lin Hong¹, and Gang Bao¹
¹Rice University, Houston, TX

FR-485

Automation of the Large-scale Patterning of Single Cells and Cell Clusters in Hydrogels

Robert Altman¹, Xiangyu Gong¹, and Kristen Mills¹
¹Rensselaer Polytechnic Institute, Troy, NY

FR-486

Constructing a Fluorescence Lifetime Nanoprobe Library to Advance Lifetime-Based Multiplexing

Louis Mejia¹, Ashwin Kainkaryam¹, Rajesh Kota¹, Soo Song¹, Lauren Lastra¹, Enrico Gratton¹, and Jered Haun¹
¹University of California, Irvine, Irvine, CA

FR-487

Investigating the Impact of Quinic Acid and Tannic Acid Surface Coating on the Uptake of Iron Oxide Nanoparticles for Effective Labeling of Cancer Cells.

Akshay Narkhede¹, Jennifer Sherwood¹, Kasie Coogan¹, Yuping Bao¹, and Shreyas Rao¹
¹The University of Alabama, Tuscaloosa, AL

FR-488

Hyperthermic Treatment of Brain Tumors Using Vascular Targeting and Cube-Shaped NanoparticleGil Covarrubias¹, Anthony Cha¹, Abdelrahman Rahmy¹, Georgia Loutrianakis¹, Morgan Lorkowski¹, Pubudu Peiris¹, and Efsthios Karathansis¹¹Case Western Reserve University, Cleveland, OH

FR-489

Engineering DNA Origami Structures on Cell Surface for Detection of Cancer Biomarkers in Cellular MicroenvironmentMelika Shakhosseini¹, Ehsan Akbari¹, Jonathan W. Song¹, and Carlos E. Castro¹¹Ohio State University, Columbus, OH

FR-490

Characterizing Dielectric Properties of Glioblastoma SubpopulationsNastaran Alinezhadbalalami¹, Temple Douglas¹, Nikita Balani¹, Scott Verbridge¹, and Rafael Davalos¹¹Virginia Tech, Blacksburg, VA

FR-491

Development of Anti-HER2 Indocyanine Green-Doxorubicin-Loaded Polyethyleneimine-Coated Perfluorocarbon Double Nanoemulsions for Targeted Photochemotherapy of Breast Cancer Cells *In Vitro*Yu-Hsiang Lee¹ and Yun-Ting Ma¹¹National Central University, Taoyuan, Taiwan

FR-492

Near-Infrared Chemiluminescent Nanoparticles for *In Vivo* Optical ImagingJung-Jae Lee¹¹University of Colorado Denver | Anschutz Medical Campus, Denver, CO

FR-493

Optically Activated Oxygen-Loaded Perfluorocarbon Nanoparticles for Ultrasound-Guided Radiation TherapySidhartha Jandhyala¹ and Geoffrey Luke¹¹Dartmouth College, Hanover, NH

FR-494

Mesoporous Silica Coating on Magnetic Iron Oxide Nanoparticles for Enhanced StabilityYu Yin¹, Sheng Tong¹, and Gang Bao¹¹Rice University, Houston, TX

FR-495

Simulation Guided Design of Multimodal MRI-Optical-Photothermal Gold NanoconstructsMir Hadi Razeghi Kondelaji^{1,2}, Abdul Kareem Parchur¹, and Amit Joshi¹¹Medical College of Wisconsin, Milwaukee, WI, ²Marquette University, Milwaukee, WI

FR-496

Integrated Single-Cell Proteomic and Metabolic Technology for Identifying Drug Resistance Mechanism in CancerYapeng Su¹, Guideng Li¹, Wei Wei², Melissa Ko³, Min Xue¹, Lidia Robert², Garry Nolan³, Sylvia Plevritis³, Antoni Ribas², David Baltimore¹, and James Heath¹¹California Institute of Technology, Pasadena, CA, ²University of California, Los Angeles, Los Angeles, CA, ³Stanford University, Palo Alto, CA

FR-497

Spectroscopy Method for the Quantification of Pancreatic Cancer Antigen in Serum Using DielectrophoresisFleming Gudagunti¹, Logeeshan Velmanickam¹, Dharmakeerthi Nawarathna¹, and Ivan Lima Jr.¹¹North Dakota State University, Fargo, ND**Track: Cancer Technologies, Drug Delivery & Intelligent Systems****Cancer Drug Delivery**

FR-498

Enhanced Drug Delivery to Mutant KRAS Pancreatic Cancer Cells by Albumin HitchhikingHannah Wang¹ and Debadyuti Ghosh¹¹The University of Texas at Austin, Austin, TX

FR-499

Engineering Drug Delivery Materials Responsive to Disease MetabolitesTae Il Kim¹, Krista Fruehau¹, Kenneth Shea¹, and Szu-wen Wang¹¹University of California, Irvine, Irvine, CA

FR-500

A Novel Drug Delivery Nanosystem for Breast Cancer TherapyLijun Wang¹ and Liang Tang¹¹University of Texas at San Antonio, San Antonio, TX

FR-501

Resveratrol and siRNA Targeted Combination Therapy for Cancer CellsThikrayat Al-Attar¹ and Sundar Madihally¹¹Oklahoma State University, Stillwater, OK

FR-502

Evaluation of Cancer Nanotherapy as a Function of Tumor VascularizationHunter Miller¹ and Hermann Frieboes^{1,2}¹University of Louisville, Louisville, KY, ²University of Louisville, Louisville, KY

FR-503

***In Situ* Forming Implants Co-loaded with Drug and Chemosensitizers to Combat Inherent Chemotherapeutic Resistance of Cancer**Emily Budziszewski¹, Selva Jeganathan¹, and Agata Exner¹¹Case Western Reserve University, Cleveland, OH

FR-504

Leveraging Decreased Non-specific Adhesivity, Receptor-targeted (DART) Nanoparticles for Treatment of Invasive Brain TumorsAniket Wadajkar¹, Jimena Dancy¹, Nina Connolly¹, Noah Gorelick², Betty Tyler², Jeffrey Winkles¹, Graeme Woodworth¹, and Anthony Kim¹
¹University of Maryland School of Medicine, Baltimore, MD, ²Johns Hopkins University School of Medicine, Baltimore, MD

FR-505

Radiation-Responsive Nanoparticles for Enhanced Radiation Therapy of Lung CancerRoshni Iyer¹, Benjamin Chen², Debabrata Saha², and Kytai Nguyen^{1,2}
¹University of Texas at Arlington, Arlington, TX, ²University of Texas Southwestern Medical Center, Dallas, TX

FR-506

Evaluating Immunotoxicology, Bio-distribution, and Pharmacokinetics of DNA Origami Nanostructures *In Vivo*Christopher Lucas¹, Amjad Chowdhury¹, Patrick Halley¹, Aparna Lakshmanan¹, Bonnie Harrington¹, Ronni Wasmuth¹, Larry Beaver¹, Rosa Lapalombella¹, Amy Johnson¹, Erin Hertlein¹, John Byrd¹, and Carlos Castro¹
¹The Ohio State University, Columbus, OH

FR-507

Drug-Reloadable Implants for Recurrent Tumor ChemotherapyKathleen Young¹ and Horst von Recum¹
¹Case Western Reserve University, Cleveland, OH

FR-508

Exosomes for Delivery of Geldanamycin to Cancer Cells with Increased Therapeutic EfficacyAkhila Dhayapalay¹ and Mathumai Kanapathipillai¹
¹University of Michigan-Dearborn, Dearborn, MI

FR-509

N- α -carbamoyl-L-glutamine 1-amide Sensitizes Cancer Cells to CisplatinAkhila Dhayapalay¹, Zhaolin Chen¹, and Mathumai Kanapathipillai¹
¹University of Michigan-Dearborn, Dearborn, MI

FR-510

Enhancement of Loading Efficiency by Co-loading of Doxorubicin and Quercetin in Polymeric MicellesPooneh Soltantabar¹ and Mihaela Stefan¹
¹The University of Texas at Dallas, Richardson, TX

FR-511

Harnessing Fibroblast Growth Factor-inducible 14 (Fn14) for Targeting Metastatic Triple Negative Breast CancerJimena Dancy¹, Aniket Wadajkar¹, Nina Connolly¹, Graeme Woodworth¹, Jeffrey Winkles¹, and Anthony Kim^{1,2}
¹University of Maryland School of Medicine, Baltimore, MD, ²University of Maryland School of Pharmacy, Baltimore, MD

FR-512

Implantable Peptide-Hydrogel Drug Delivery System for Treating Glioblastoma MultiformeArica Gregory¹
¹Clemson University, Gaffney, SC

FR-513

Comparison of Real-Time Imaging and Endpoint Analysis of Drug Therapeutic Efficacy in Glioblastoma Multiforme CellsTimothy Samec¹, Kayla Shine¹, Sarah Mbiki¹, Jordon Gilmore¹, and Angela Alexander-Bryant¹
¹Clemson University, Clemson, SC

FR-514

Sophorolipid Anticancer Properties in 2D and 3D Tumor ModelsDavid Kingsley¹, Lexie Cornely¹, Filbert Totsingan¹, Richard Gross¹, and David Corr¹
¹Rensselaer Polytechnic Institute, Troy, NY

FR-515

Novel Drug Eluting Wafers for Glioblastoma TreatmentAntonio Webb¹ and Tarielle Jones¹
¹University of Florida, Gainesville, FL

FR-516

Design Optimization of Anticancer Nanoparticles Considering Vascularized Tumor Growth DynamicsIbrahim Chamseddine¹, Hermann Frieboes^{2,3}, and Michael Kokkolaras¹
¹McGill University, Montreal, QC, Canada, ²University of Louisville, Louisville, KY, ³James Graham Brown Cancer Center, Louisville, KY

FR-517

Controlled Release of Dinutuximab from Lyophilized Silk Fibroin Foams for Neuroblastoma TreatmentKimberly J. Ornell¹, Jasmine Zeki², Bill Chiu², and Jeannine M. Coburn¹
¹Worcester Polytechnic Institute, Worcester, MA, ²Stanford University Medical Center, Stanford, CA

FR-518

Bioprocessing Optimization of Antibody-Drug Conjugates for Breast Cancer TreatmentJianfa Ou¹, Yingnan Si¹, Ningning Xu¹, KahYong Goh¹, Jiajia Song¹, Lufang Zhou¹, and X. Margaret Liu¹
¹The University of Alabama at Birmingham, Birmingham, AL

FR-519

Surface Receptors Discovery and Therapy Development for Neuroendocrine TumorJianfa Ou¹, Yingnan Si¹, Jiajia Song¹, Ningning Xu¹, Rachael Guenter¹, Renata Jaskula-Sztul¹, Lufang Zhou¹, and X. Margaret Liu¹
¹The University of Alabama at Birmingham, Birmingham, AL

FR-520

Immune Cell-Powered Delivery of Clickable Biodegradable Fluorescent Nanoparticles Targeting Brain CancerVirginia Aragon Sanabria¹, Gloria B. Kim¹, Jian Yang¹, Xiaojun (Lance) Lian¹, James Connor¹, and Cheng Dong¹
¹Penn State University, University Park, PA

FR-521

Cisplatin Pharmacodynamics Following Endobronchial Ultrasound-Guided Transbronchial Needle Injection into a Lung TumorJason Bates¹, Vitor Mori², and C. Matthew Kinsey¹
¹University of Vermont, Burlington, VT, ²University of Sao Paulo, Sao Paulo, Brazil

FR-522

Development of Dual Imaging-Guided Oxidative-Photothermal Combinational NanotherapeuticsJoungyoun Noh¹, Hanui Lee¹, Changgon Ko¹, and Dongwon Lee¹
¹Chonbuk National University, Jeonju, Korea, Republic of

FR-523

Neutrophil Extracellular Matrix Binding Cationic Nanoparticles to Target Cancer CellsNoshin Hussain¹, Priyan Weerappuli², Shuichi Takayama³, and Mathumai Kanapathipillai¹
¹University of Michigan-Dearborn, Dearborn, MI, ²University of Michigan, Ann Arbor, MI, ³Georgia Tech, Atlanta, GA

FR-524

The Multi-targeted Anticancer Activity of the Abietane Diterpenoid, DeacetylnemoroneWesley Taylor¹, Sara Moghadam¹, and Ehsan Jabbarzadeh¹
¹University of South Carolina, Columbia, SC

FR-525

High-Throughput Combination Drug Screening for the Discovery of Pediatric Cancer NanomedicinesJames Kelvin¹, Lacey Perdue¹, Priscilla Do¹, and Erik Dreaden¹
¹Emory University, Atlanta, GA

FR-526

Efficient Expression of Anti-CD20 Monoclonal Antibody Using CHO CellYingnan Si¹, Ningning Xu¹, Jianfa Ou¹, Daniel D Flanigan¹, Jiajia Song², Lufang Zhou², and X. Margaret Liu¹
¹Department of Biomedical Engineering, University of Alabama at Birmingham, Birmingham, AL, ²Department of Medicine, University of Alabama at Birmingham, Birmingham, AL

FR-527

Dye-Linked Zinc Oxide Nanocomposites as PhotosensitizersJaspreet Singh Nagi¹, Kenneth Skoreniko², William Bernier^{1,2}, Wayne Jones³, and Amber Doiron¹
¹Binghamton University, Binghamton, NY, ²ChromaNanoTech, Binghamton, NY, ³University of New Hampshire, Durham, United States Minor Outlying Islands

FR-528

Study of Manganese based Magnetic Nanoparticle Treatment on T47D Breast Cancer Cell in the Presence and Absence of DOXShawn McGinley¹, Saion Sinha¹, and Christina Zito¹
¹University of New Haven, West Haven, CT**Track: Cancer Technologies****Cancer Immunoengineering**

FR-529

Functional Recovery of NK Cell Activity By Nanoparticle-mediated Delivery of TGFB β 2 siRNAIsaac Adjei¹, Jahnelle Jordan¹, Nhan Tu², Thu Le Trinh², Sheng Wei², and Blanka Sharma¹
¹University of Florida, Gainesville, FL, ²Moffitt Cancer Center, Tampa, FL

FR-530

Ovarian Cancer Stem Cells Reciprocally Interact with Macrophages to Create an Immune-suppressive and Chemoresistant Microenvironment in 3D SpheroidsShreya Raghavan¹ and Geeta Mehta¹
¹University of Michigan, Ann Arbor, MI

FR-531

Re-engineering Cancer Cell Surfaces Using Polymeric Thin Films and Immune AdjuvantsCarcia Carson¹, Max Jacobson¹, Sema Sevimli¹, and John Wilson¹
¹Vanderbilt University, Nashville, TN

FR-532

MiR-34a is a MicroRNA Safeguard for the Inflammatory Colon Stem Cell NicheErgang Wang¹, Lihua Wang¹, Roberts Mines¹, Kai-Yuan Chen¹, Nikolai Rakhilin¹, Gaiting Zhou¹, Pengcheng Bu², and Xiling Shen¹
¹Duke University, Durham, NC, ²Institute of Biophysics, Chinese Academy of Sciences, Beijing, China, People's Republic of

FR-533

Engineering a Hypoxic Tumor Model for CAR-T Cell TherapyYuta Ando¹, Hoang Ta¹, Elizabeth Siegler¹, Pin Wang¹, and Keyue Shen¹
¹University of Southern California, Los Angeles, CA

FR-534

Microfluidic Device for Two-Way Tumor-Lymph Node CommunicationSangjo Shim¹, Alexandra Harris¹, Jennifer Munson², and Rebecca Pompano¹
¹University of Virginia, Charlottesville, VA, ²Virginia Tech, Blacksburg, VA

FR-535

Enhancement of Macrophage Immun Response by a Natural Compound from Acylphloroglucinol ClassMaria Yanez¹ and Ehsan Jabbarzadeh¹
¹University of South Carolina, Columbia, SC

FR-536

In Vivo Metabolic Labeling and Targeted Modulation of Dendritic CellsHua Wang^{1,2}, Kai wucherpennig^{3,4}, and David Mooney^{1,2}
¹Harvard University, Cambridge, MA, ²Wyss Institute for Biologically Inspired Engineering, Boston, MA, ³Dana-Farber Cancer Institute, Boston, MA, ⁴Harvard Medical School, Boston, MA

FR-537

Optimizing Output and Throughput of Enrichment of Rare Antigen Specific CD8⁺ T CellsAriel Isser¹, John Hickey^{1,2}, Kayla Gee¹, Sebastian Salathe¹, Yi Dong³, and Jonathan Schneck³
¹Johns Hopkins University, Baltimore, MD, ²Institute for NanoBioTechnology, Baltimore, MD, ³Johns Hopkins School of Medicine, Baltimore, MD

FR-538

Immunotherapeutic Effect of Iron Oxide Nanoparticles Inhibits Metastases in LiverSaeid Zanganeh¹ and Morteza Mahmoudi²
¹Sloan Kettering Institute for Cancer Research, New York, NY, ²Harvard Medical School, Boston, MA

FR-539

Depletion of Myeloid Derived Suppressor Cells by Synthetic Nanoparticle Antibodies as a Novel Cancer Immunotherapy

Jiaying Liu^{1,2}, Pallab Pradhan¹, Randall Toy¹, and Roy Krishnendu^{1,2}
¹Georgia Institute of Technology, Atlanta, GA, ²Emory University, Atlanta, GA

FR-540

Tumor-specific T Cell Activation Using Cell-Sized Unilamellar Vesicles as an Artificial Antigen Presenting Cell

Shi-Hui Lee¹, Jui-Yi Chen¹, Abraham Lee¹, and Anshu Agrawal¹
¹UC Irvine, Irvine, CA

FR-541

Engineered Marrow Macrophages Suppress Growth of Syngeneic, Orthotopic Tumors in Immunocompetent Mice

Jason Andrechak¹, Larry Dooling¹, Cory Alvey¹, and Dennis Discher¹
¹Biophysical Engineering Lab & Physical Sciences Oncology Center, University of Pennsylvania, Philadelphia, PA

Track: Cancer Technologies, Biomechanics

Cancer Mechanobiology

FR-542

Meta-analyses of Matrix & Nuclear Mechanical Factors in Breast, Lung, & Liver Cancer using TCGA Data

Manasvita Vashisth¹, Sangkyun Cho¹, and Dennis Discher¹
¹University of Pennsylvania, Philadelphia, PA

FR-543

The Role of KRAS in Extracellular Matrix Stiffness induced Epithelial-to-Mesenchymal Transition of NSCLC

Krista Powell¹, Anthony Faber¹, and Rebecca Heise¹
¹Virginia Commonwealth University, Richmond, VA

FR-544

Enhanced Epithelial-Mesenchymal Transition Elicited by Aligned Extracellular Matrix Through YAP

JinSeok Park¹, Deok-Ho Kim², Sagar Shah³, Alfredo Quinones-Hinojosa³, and Andre Levchenko¹
¹Yale University, New Haven, CT, ²University of Washington, Seattle, WA, ³Mayo clinic, Jacksonville, FL

FR-545

Matrix Stiffening Regulates Cancer Cell Angiogenic Activity

Malak Nasser¹ and Gargi Ghosh¹
¹University of Michigan, Dearborn, Dearborn, MI

FR-546

Biophysical Factors Regulate the Initiation and Maintenance of Multinucleated Breast Cancer Cells

Peiran Zhu¹, Ning-Hsuan Tseng¹, Shelly Peyton¹, and Yubing Sun¹
¹UMass-Amherst, Amherst, MA

FR-547

Adhesion Strength Regulates Durotaxis in Metastatic Cancer Cells

Benjamin Yeoman^{1,2}, Pranjali Beri¹, Adam Engler^{1,3}, and Parag Katira²
¹University of California San Diego, San Diego, CA, ²San Diego State University, San Diego, CA, ³Sanford Consortium for Regenerative Medicine, San Diego, CA

FR-548

Compressive Stimulus Enhances Ovarian Cancer Proliferation, Invasion, and Mechanotransduction in a Novel 3D Compression Bioreactor

Caymen Novak¹, Eric Horst¹, and Geeta Mehta¹
¹University of Michigan, Ann Arbor, MI

FR-549

Design of an Adapter for High-throughput Interrogation of Multiple Interstitial Flow Velocities

Caleb Stine¹, Kathryn Kingsmore², and Jennifer Munson¹
¹Virginia Tech, Blacksburg, VA, ²University of Virginia, Charlottesville, VA

FR-550

Mutational Heterogeneity and ECM Stiffness Promote Metastatic Behavior in Mammary Acini

Christopher Plunkett¹, Aditya Kumar¹, Jesse Placone¹, Jaime Yrastorza¹, Yang Hsun Hao¹, Daehwan Kim¹, Laurent Fattet¹, Jing Yang¹, and Adam Engler¹
¹University of California San Diego, La Jolla, CA

FR-551

Increased Activin Secretion in Response to Increased Force Leads to Rise in Cancer Cell Migration

Jessica Bauer¹, M A Bashir Emon², Georgina Mancinelli¹, Jonas J Staudacher¹, Nancy Krett¹, Paul Grippo¹, Barbara Jung¹, and Taher Saif²
¹University of Illinois, Chicago, Chicago, IL, ²University of Illinois, Urbana-Champaign, Urbana, IL

FR-552

Mechanical Characterization of Ovarian Cancer Nodules Using Brillouin Confocal Microscopy

Christina Conrad¹, Kelsey M. Gray², Kimberly M. Stroka², Imran Rizvi³, and Giuliano Scarcelli¹
¹Optics Biotech Lab, University of Maryland, College Park, MD, ²Cell and Microenvironment Engineering Lab, University of Maryland, College Park, MD, ³Wellman Center for Photomedicine, Massachusetts General Hospital, Boston, MA

FR-553

Glycocalyx-Induced Membrane Shapes and Microvesicle Biogenesis & Shedding

LaDeidra Monet Roberts¹, Rose Yin¹, Jade Noble¹, Carolyn Shurer¹, Joe Chin Hun Kuo¹, Jay Gandhi¹, Jin Su¹, Heidi Reesink¹, Lena Kourkoutis¹, and Matthew Paszek¹
¹Cornell University, Ithaca, NY

FR-554

Enhancement of Tumor Therapy Through the Regulation of Tumor IFP

Cheng Li¹ and Xiqun Jiang¹
¹Nanjing University, Nanjing, China, People's Republic of

FR-555

A Cell-based Stiffness Sensor to Study and Treat Disease via Biophysical Cues

Shirley Zhang¹, Linan Liu¹, Jan Zimak¹, and Weian Zhao¹
¹University of California, Irvine, Irvine, CA

FR-556

Oscillatory Forces—a Biomechanical Model for Breast Cancer

Tess Vessels¹, Derek Van Vessem¹, Paige Severino¹, Kenneth Hough¹, Jessy Deshane¹, and Joel Berry¹
¹The University of Alabama at Birmingham, Birmingham, AL

FR-557

Oscillatory Forces Modulate Breast Cancer-Derived Exosomes

Paige Severino¹, Derek Van Vessem¹, Kenneth Hough¹, John Strenkowski¹, Tess Vessels¹, Jessy Deshane¹, and Joel Berry¹
¹University of Alabama at Birmingham, Birmingham, AL

FR-558

Enhanced Cell Migration Against Increased Resistance

Kaustav Bera¹, Adrianna Boen¹, Panagiotis Mistrionis¹, and Konstantinos Konstantopoulos¹
¹Johns Hopkins University, Baltimore, MD

Track: Cancer Technologies

Precision Medicine and Biomarkers in Cancer

FR-559

Engineered Colorectal Cancer Model Employing Patient-Derived Xenografts Mimics *In Vivo* Tumor Growth

Iman Hassani¹, Benjamin Anbiah¹, Bulbul Ahmed¹, Nicole Habbit¹, Michael Greene¹, and Elizabeth Lipke¹
¹Auburn University, Auburn, AL

FR-560

Improving Cancer Screening Using A Novel Protein Energetics Model

Zachary Fritz¹, Lawrence Williams¹, Rene Schloss¹, Anil Shrirao¹, and Martin Yarmush¹
¹Rutgers University, Piscataway, NJ

FR-561

Electric Field Therapy for Glioblastoma: Modulation of Tumor Cell Surface Phosphatidylserine Levels

Ahmet Kaynak¹, Harold W. Davis¹, Daria Narmoneva¹, Andrei B. Kogan¹, and Xiaoyang Qi¹
¹University of Cincinnati, Cincinnati, OH

FR-562

24R,25(OH) 2D3 a Metabolite of Vitamin D3, has a Differentially Tumorigenic Effect in ER+ and ER-Breast Cancer

Anjali Verma¹, D. Joshua Cohen¹, Chandana Muktipaty¹, Barbara D. Boyan^{1,2}, and Zvi Schwartz^{1,3}
¹Virginia Commonwealth University, Richmond, VA, ²Georgia Institute of Technology, Atlanta, GA, ³University of Texas Health Science Center at San Antonio, San Antonio, TX

FR-563

Examining Receptors for Oligomannose as Potential Diagnostic Tools for Follicular Lymphoma

Bu-Taek Lim¹, LeNaiya Kydd¹, and Justyn Jaworski¹
¹University of Texas at Arlington, Arlington, TX

FR-564

Primary Patient Lung Cancer Model for Study of Disease and Drug Treatment Response

Andrea Mazzocchi^{1,2}, Aleksander Skardal^{1,2,3}, and Shay Soker^{1,2,3}
¹WF-VT School of Biomedical Engineering and Sciences, Winston-Salem, NC, ²Wake Forest Institute for Regenerative Medicine, Winston-Salem, NC, ³Wake Forest Health Comprehensive Cancer Center, Winston-Salem, NC

Track: Biomedical Imaging and Instrumentation, Cancer Technologies

Imaging Strategies and Molecular Profiling in Cancer

FR-565

Liquid Biopsy for Early Cancer Detection

Hyun Ji Kim¹, Fehmi Civitci¹, Josiah Wagner¹, Pavana Anur¹, Matthew Rames¹, Xiaolin Nan¹, Terry Morgan¹, Dennis Duran¹, and Thuy Ngo¹
¹OHSU, Portland, OR

FR-566

Can Tumor Texture Analysis Predict the Effectiveness of Treatment in the Case of Head and Neck Squamous Cell Carcinoma Tumors?

Apurva Singh¹, Sharad Goyal², and Murray Loew¹
¹George Washington University, Washington, DC, ²George Washington University Medical Center, Washington, DC

FR-567

Characterization of Nitric Oxide in Healthy and Diseased Cells

Joseph Stapleton¹, Eric Hofferber¹, and Nicole Iverson¹
¹University of Nebraska—Lincoln, Lincoln, NE

FR-568

Targeting EphA2 Receptors with Peptide-Functionalized Erythrocyte-Derived Nanoparticles

Taylor Hanley¹, Ahmed Farouk Salem¹, Luca Gambini¹, Maurizio Pellicchia¹, and Bahman Anvari¹
¹University of California, Riverside, Riverside, CA

FR-569

The Design of Cell Chambers to Study Bacterial Invasion of Endothelial Cells

Barath Udayasuryan¹, Daniel Slade¹, and Scott Verbridge¹
¹Virginia Tech, Blacksburg, VA

FR-570

Multiplexed Ion Beam Imaging Reveals Co-Expression of Antigens and a Structured Tumor-Immune Microenvironment in High Risk Pediatric Neuroblastoma

Hasini Jayatilaka¹, Marc Bosse¹, Jasmine Zeki¹, Leeat Keren¹, Bill Chiu¹, Michael Angelo¹, and Kara Davis¹
¹Stanford University, Stanford, CA

Track: Cancer Technologies

Cancer Technologies–Other/Non-specified

FR-571

Monte Carlo Modeling of the Effects of Beta Radiation from a Unique Beta Source on the Skin Surface

Olga V. Pen^{1,2}, Peter A. Antinozzi², and J. Daniel Bourland²
¹Wake Forest University, Winston-Salem, NC, ²Wake Forest School of Medicine, Winston-Salem, NC

FR-572

A Polymer Thin Film Platform that Promotes Direct Conversion of Cancer Cell Lines to Tumorigenic Cell Spheroids

Seung Jung Yu¹, Minsuk Choi¹, Yoonjung Choi¹, Hak Rae Lee¹, Eunbeol Lee¹, Eunjung Lee¹, Jin Yong Kim¹, Sukmo Kang¹, Jieung Baek¹, Daeyoung Lee¹, Sangyong Jon¹, and Sung Gap Im¹
¹Korea Advanced Institute of Science and Technology, Daejeon, Korea, Republic of

FR-573

Biomaterial-Assisted Ectopic Skin Engraftment of Internal Tissues to Study Tissue-Specific Metastasis

Ryan Carpenter¹ and Jungwoo Lee¹
¹University of Massachusetts Amherst, Amherst, MA

FR-574

Application of Thermo-responsive Polymer and Microfluidics to the Development of a Point of Care Inspired Velocity-Dependent Cell-Sorting Microdevice

Jesse Fine¹, Natalia Higuera-Castro¹, Vasudha Chaurey-Shukla¹, and Daniel Gallego-Perez¹
¹The Ohio State University, Columbus, OH

FR-575

Design, Development and Evaluation of a Core Needle Biopsy Device Towards Reducing the Risk of Contamination in Low-Resource Settings

Sophia Triantis¹, Valerie Zawicki¹, Laura Hinson¹, and Madeline Lee¹
¹Johns Hopkins University, Baltimore, MD

FR-576

Real-Time Monitoring of Fructose Uptake Modulation Outcomes in Breast Cancer Cells

Avik Ghosh¹, Vagarshak Begoyan¹, Smitha Rao¹, and Marina Tanasova¹
¹Michigan Technological University, Houghton, MI

FR-577

Design, Development, and Validation of an Improved Biopsy Device for Diagnosing Cholangiocarcinoma

Aine O'Sullivan¹, Ryan Lu¹, Olivia Musmanno¹, Emily Burnette¹, Varun Kedia¹, Jesse Rines¹, Clark Fischer¹, Andie Seabrooke¹, Robert Allen^{1,2}, Amir Manbachi^{1,2}, and Clifford Weiss^{2,3}
¹Johns Hopkins University, Baltimore, MD, ²The Johns Hopkins Center for Bioengineering Innovation and Design (CBID), Baltimore, MD, ³Johns Hopkins Hospital, Baltimore, MD

Track: Biomedical Imaging and Instrumentation, Translational Biomedical Engineering

Image Guided Therapies

FR-578

A Semiautomatic Prostate Segmentation in CT Images Using a Deep Learning Approach

Maysam Shahedi¹, Martin Halicek², Rongrong Guo³, Guoyi Zhang³, David Schuster³, and Baowei Fei^{1,2,3,4}
¹University of Texas at Dallas, Richardson, TX, ²Emory University and Georgia Institute of Technology, Atlanta, GA, ³Emory University, Atlanta, GA, ⁴University of Texas Southwest Medical Center, Dallas, TX

FR-579

Towards Deformable Image Guidance with Point-based Registration for Trans-oral Surgery

Xiaotian Wu¹, Joseph Paydarfar^{1,2,3}, and Ryan Halter^{1,3}
¹Thayer School of Engineering at Dartmouth College, Hanover, NH, ²Dartmouth Hitchcock Medical Center, Lebanon, NH, ³Geisel School of Medicine at Dartmouth College, Hanover, NH

FR-580

Image-Guided Smart Laser System for Detection and Treatment of Osteoarthritis

Nitesh Katta¹, John Rector¹, Kevin Choy¹, Michael Gardner¹, Austin McElroy¹, and Thomas Milner¹
¹The University of Texas at Austin, Austin, TX

FR-581

A Computational Framework to Optimize Fiducial Marker Placement to Account for Intraoperative Tissue Deformation

Ye Han¹, Yoed Rabin¹, and L. Burak Kara¹
¹Carnegie Mellon University, Pittsburgh, PA

Track: Biomechanics

Computational and Multiscale Modeling in Biomechanics

FR-582

Understanding Mechanics of Blood Clot Contraction Via Computational Modeling

Yueyi Sun¹, David Myers^{1,2}, Wilbur Lam^{1,2}, and Alexander Alexeev¹
¹Georgia Institute of Technology, atlanta, GA, ²Emory University School of Medicine, atlanta, GA

FR-583

Multi-Agent Model Reveals the Crucial Factors in Leukocyte Extravasation During Atherogenesis

Rita Bhui¹ and Heather Hayenga¹
¹University of Texas at Dallas, Richardson, TX

FR-584

Multiscale Modeling of Thrombus Biomechanics in Aortic Dissections

Alireza Yazdani¹ and George Karniadakis¹
¹Brown University, Providence, RI

FR-585

A Three-Dimensional Dynamical Model of the Rat VibrissaNadina Zweifel¹ and Mitra Hartmann¹
¹Northwestern University, Evanston, IL

FR-586

Modelling of Bio-Degradation in Engineered Tissue ScaffoldsPriyanka Patki¹ and Francesco Costanzo¹
¹The Pennsylvania State University, University Park, PA

FR-587

EMG-Based Decoding of Human Knee and Ankle MovementsDali Xu¹, Jie Liu², and Li-Qun Zhang¹
¹University of Maryland Baltimore, Baltimore, MD,
²Kaymounting Service Ltd, London, United Kingdom

FR-588

Chest and Lumbar Injury Metric Sensitivity to Spaceflight Landing ConditionJames Gaewsky¹, Derek Jones¹, Xin Ye¹, Bharath Koya¹, Mona Saffarza-deh¹, Kyle McNamara¹, Scott Gayzik¹, Ashley Weaver¹, and Joel Stitzel¹
¹Virginia Tech-Wake Forest University, Winston-Salem, NC

FR-589

Variations in Lens Mechanical Properties with Position, Age, and GenotypeNicholas Hazen¹ and Matthew Reilly²
¹Ohio State University, Pataskala, OH, ²Ohio State University, Columbus, OH

FR-590

Biomechanical Assessment of a Novel Elastomer Lumbar Total Disc Replacement: A Finite Element StudyAli Kiapour¹ and Vijay Goel¹
¹Engineering Center for Orthopaedic Research Excellence, The University of Toledo, Toledo, OH

FR-591

Modeling of Axon Plasma Membrane with Its Impact on Diffusion of Membrane ProteinsGeorge Lykotraftis¹, Yihao Zhang¹, and Anastasios Tzingounis¹
¹University of Connecticut, Storrs, CT

FR-592

The Impact of Viscosity Models on CFD Prediction of Blood Flow in a Ventricular Assist DeviceJiafeng Zhang¹, Zengsheng Chen¹, R. Gregory Conway¹, Bartley Griffith¹, and Zhongjun Wu^{1,2}
¹University of Maryland Baltimore, Baltimore, MD,
²University of Maryland, College Park, College Park, MD

FR-593

Mechanically Passive Exoskeletons: Making Them Work for You, Not Against YouAllison Nelson¹, Patrick Hall¹, and Dustin Crouch¹
¹University of Tennessee, Knoxville, TN

FR-594

Pressure Driven Arterial RemodelingMaziyar Keshavarzian¹, Clark Meyer¹, and Heather Hayenga¹
¹University of Texas at Dallas, Richardson, TX

FR-595

Numerical Modeling of Adhesion of Shear-injured Platelets on CollagenLiwei Wang¹, Zengsheng Chen², Jiafeng Zhang², Xiwen Zhang¹, and Zhongjun Wu^{2,3}
¹Tsinghua University, Beijing, China, People's Republic of,
²University of Maryland School of Medicine, Baltimore, MD,
³University of Maryland, College Park, MD

FR-596

The Role of UIV Screw Size on Proximal Junction Kyphosis: A Finite Element ModelAlan Eberhardt¹, Hank Ballard¹, Jason Pittman¹, Lee Moradi¹, and David Littlefield¹
¹University of Alabama at Birmingham, Birmingham, AL

FR-597

Biomechanical Effects of Fiber InterweavingBingrui Wang^{1,2}, Yi Hua², and Ian A. Sigal²
¹Southwest Jiaotong University, Chengdu, China, People's Republic of,
²University of Pittsburgh, Pittsburgh, PA

FR-598

Effect of Anatomical Characteristics of Femur and Tibia on Optimal Femoral Tunnel Position for Implanted Graft during ACL Reconstruction SurgeryTae Soo Bae¹, Byeong Chan Cho¹, and Dai-Soon Kwak²
¹Jungwon Univ., Chungbuk, Korea, Republic of,
²The Catholic University of Korea, Seoul, Korea, Republic of

FR-599

Identifying Gait Phase Transitions and Perturbed Gait Dynamics Using Switching Linear Dynamical ModelsLuke Drnach¹, Irfan Essa¹, and Lena Ting^{1,2}
¹Georgia Institute of Technology, Atlanta, GA, ²Emory University, Atlanta, GA

FR-600

Multiscale Modeling of Blood Flow and Platelet Mediated ThrombosisPeng Zhang¹, Jawaad Sherif¹, Prachi Gupta², Changnian Han², Marvin J. Slepian³, Yuefan Deng², and Danny Bluestein¹
¹Biomedical Engineering Department, Stony Brook University, Stony Brook, NY, ²Applied Mathematics Department, Stony Brook University, Stony Brook, NY, ³Sarver Heart Center, University of Arizona, Tucson, AZ

FR-601

A 3D Printed Ear Model for Standardized Testing of Hearing Protection Devices to Blast ExposureMarcus Brown¹, Shangyuan Jiang¹, and Rong Gan¹
¹University of Oklahoma, Norman, OK

FR-602

Computational Modeling of Articular CartilageMuhammad Salim¹, Ferris Pfeiffer¹, and Lia Howe¹
¹University of Missouri, Columbia, MO

FR-603

Non-linear Finite Element Model of Thigh Soft Tissue Mechanical Behavior Informed By *In Vivo* Experimental DataSheng Chen¹, Justin Scott¹, Tamara Bush¹, and Sara Roccabianca¹
¹Michigan State University, East Lansing, MI

FR-604

Assessment of Brain Injury Metrics Due to Vehicular Impacts

P.R. Berthelson^{1,2}, G.G. Stubblefield³, J.W. Wood^{1,2}, M.D. Jones⁴, M.F. Horstemeyer^{1,2}, and R.K. Prabhu^{1,2}
¹Mississippi State University, Starkville, MS, ²Mississippi State University, Mississippi State, MS, ³University of Alabama, Tuscaloosa, AL, ⁴Cardiff University, Cardiff, Wales, United Kingdom

FR-605

Gait and Cycling Finite Element Predictions of Knee Cartilage Pressure for Linear and Porous Elastic Materials

Michael Rumery¹, Gregory Lane¹, Stephen Klisch¹, and Scott Hazelwood¹
¹California Polytechnic State University, San Luis Obispo, CA

FR-606

Modeling the Biomechanics Underlying the Development of the Neural Tube in the Chick Embryo

Hannah Grover¹, Wei Zeng¹, Shicheng Huang¹, Lina Zhang², Yan Li¹, and Zi Chen¹
¹Dartmouth College, Hanover, NH, ²Shanghai Jiao Tong University, Shanghai, China, People's Republic of

FR-607

Nanoparticle Transport in Cellular Blood Flow through Microvascular Bifurcations

Zixiang Liu¹, Jonathan Clausen², Dan Bolintineanu², Justin Wagner², Kimberly Butler², Rekha Rao², and Cyrus Aidun¹
¹Georgia Institute of Technology, Atlanta, GA, ²Sandia National Laboratories, Albuquerque, NM

Track: Bioinformatics, Computational and Systems Biology

Computational Modeling of Cell Motility and Proliferation

FR-608

Stochastic Spatial and Temporal Population-based Model for the Co-emergence of Vascular Patterns

Jose Zamora¹, Ajay Gopinathan¹, and Kara McCloskey¹
¹University of California Merced, Merced, CA

FR-609

Quantitative Characterization of Fluorescent Biosensor Performance based on Spectral Analysis of Cellular Morphodynamics

Xiao Ma¹, Ellen O'Shaughnessy², Klaus Hahn², and Gaudenz Danuser¹
¹University of Texas Southwestern Medical Center, Dallas, TX
²University of North Carolina at Chapel Hill, Chapel Hill, NC

FR-610

An Enhanced Computational Model for Slow Wave Entrainment in the Stomach

Ashfaq Ahmed¹ and Ranu Jung¹
¹Florida International University, Miami, FL

FR-611

Integrative Model of Actin, Adhesion, and Signaling Dynamics at the Leading Edge of Migrating Cells

Ankit Chandra¹ and Jason Haugh¹
¹North Carolina State University, Raleigh, NC

Track: Cellular and Molecular Bioengineering

Engineering and the Extracellular Matrix and Plasma Membrane

FR-612

Cyclic Stretch Induces Caveolin-1 Release in Extracellular Vesicles from Vascular Smooth Muscle Cells

Mohammad Shaver¹ and Joshua D Hutcheson¹
¹Florida International University, Miami, FL

FR-613

Orientation of Collagen Fibrils as a Novel Driver of Breast Tumor Cell Growth in Hormone-Free Culture

Ana M. Reyes-Ramos¹, Jorge Almodóvar¹, Madeline Torres-Lugo¹, and Maribella Domenech¹
¹University of Puerto Rico- Mayaguez Campus, Mayaguez, Puerto Rico

FR-614

Effect of Stiff Basement Matrices on the Endothelial Glycocalyx: Regulation of Heparan Sulfate Production by EXT3

Rick Mathews¹, Marwa Mahmoud¹, Mariya Mayer¹, Anne Marie Bartosch¹, Limary Cancel¹, and John Tarbell¹
¹The City College of New York, New York, NY

Track: Cellular and Molecular Bioengineering

Engineering and the Microbiome

FR-615

Multiscale Agent-based Modeling of Environmental Microbiomes

Mohammad Soheilypour¹, Ameen Razavi², Fatemeh Shirazi², and Mohammad Mofrad¹
¹University of California Berkeley, Berkeley, CA,
²Microvi Biotechnologies Inc., Hayward, CA

FR-616

Electrochemical Control of Bacterial Co-cultures via Engineered Quorum Sensing Circuits

Kristina Stephens¹, Narendranath Bhokisham¹, and William Bentley¹
¹University of Maryland, College Park, MD

FR-617

Development of a Single Microbe Model of the Gut Microbiome-Epithelial-Immune Axis

Joshua Luchan¹, Christian Choi¹, and Rebecca Carrier¹
¹Northeastern University, Boston, MA

Track: Tissue Engineering

Engineering Replacement Tissues

FR-618

A Bio-inspired Hybrid Nanosack to Improve the Efficacy of Islet Transplantation in the OmentumJacob Garcia¹, Patrick Hwang², Dishant Shah¹, Dong-Jin Lim¹, Grant Alexander¹, David Cooper¹, Anath Shalev¹, Wanxing Cui³, Shawn Gilbert¹, and Ho-Wook Jun¹¹University of Alabama at Birmingham, Birmingham, AL,²Endomimetics, LLC, Birmingham, AL, ³Medstar Georgetown Hospital, Washington DC, DC

FR-619

Optimizing Functional Re-endothelialization of Acellular Liver Scaffold Using REDV Cell-binding DomainBasak Uygun¹, Julie Devalliere¹, Yibin Chen¹, Kevin Dooley¹, and Martin Yarmush^{1,2}¹Center for Engineering in Medicine, MGH, Harvard Medical School, Shriners Hospital for Children, Boston, MA, ²Rutgers University, Piscataway, Piscataway, NJ

FR-620

Bioprinting Using a Collagen Bioink Derived from Decellularized OrgansChandler Warr¹ and Alonzo Cook¹¹Brigham Young University, Provo, UT

FR-621

The Role of Porosity and Pore Size in Prevascularizing Electrospun Cardiac PatchesEmily Beck¹ and Jeffrey Jacot¹¹University of Colorado Denver, Aurora, CO

FR-622

Conductive Polyaniline-PCL electrospun fibers for neuron regenerationFábio Garrudo^{1,2}, Caitlyn Chapman¹, Pauline Hoffman¹, Ranodhi Undagawa¹, João Silva^{1,2}, Paízy Mikael¹, Carlos Rodrigues², Jorge Morgado², Frederico Ferreira², and Robert Linhardt¹¹Rensselaer Polytechnic Institute, TROY, NY, ²IST, Lisboa, Portugal

FR-623

Influence of Perivascular Cells And Perfusion On Prevascular Networks In Scaffold Free Endothelial Fibroblast ConstructsSanket Pattanaik¹, Sarah Grace Dennis¹, Stephen Fann¹, and Michael Yost¹¹Medical University of South Carolina, Charleston, SC

FR-624

Tissue Engineered Aortic Heart Valve Roots: In Vitro Characterization and Cell SourcingMegan Casco¹ and Dan Simionescu¹¹Clemson University, Clemson, SC

FR-625

Nipple Engineering: Maintaining Nipple Projection with Externally Scaffolded Autologous Costal CartilageArash Samadi¹, Alexandra J. Lin¹, Matthew A. Wright¹, Jaime L. Bernstein¹, Daniel O. Lara¹, Justin S. Buro¹, Karel-Bart Celie¹, Yoshiko Toyoda¹, Alice Harper¹, and Jason A. Spector^{1,2}¹Laboratory of Bioregenerative Medicine and Surgery, Weill Cornell Medicine, New York City, NY, ²Meinig School of Biomedical Engineering, Cornell University, Ithaca, NY

FR-626

Re-Epithelialization of Whole Decellularized KidneysAlonzo Cook¹, Nafiseh Poornejad¹, Beverly Roeder¹, and Paul Reynolds¹¹Brigham Young University, Provo, UT

FR-627

Ultrathin Antioxidant Cerium Oxide Nanoparticles Coatings Protect Encapsulated Beta Cells from Oxidative StressNicholas Abuid¹, Kerim Gattas-Asfura¹, Emily Schofield¹, and Cherie Stabler¹¹University of Florida, Gainesville, FL

Track: Biomaterials, Stem Cell Engineering

Engineering the Stem Cell Microenvironment

FR-628

A New 3D mESC Culture System and CharacterizationChang Hyun Lee¹ and Harvinder Gill²¹Texas Tech University, Lubbock, TX, ²Department of Chemical Engineering, Texas Tech University, Lubbock, TX

FR-629

Spatially Defined 3D Microtissue Arrays for Investigating Microenvironmental Control of Liver Progenitor Cell DifferentiationIan Berg¹ and Gregory Underhill¹¹University of Illinois Urbana Champaign, Urbana, IL

FR-630

Scalable Expansion of Human Primary T Cells in a Physiologically Relevant MicroenvironmentHaishuang Lin¹, Qiang Li¹, and Yuguo Lei¹¹University of Nebraska-Lincoln, Lincoln, NE

FR-631

Modulation of MSC Secretome by Integrin- and Cadherin-Engaging SubstratesGilad Doron¹, Molly Ogle¹, Levi Wood¹, and Johnna Temenoff¹¹Georgia Institute of Technology, Atlanta, GA

FR-632

Ultrasound Induces Microenvironment Changes to Enhance Homing of Mesenchymal Stem Cells Through Mechanical Activation of TRPC1 Sodium CurrentsRebecca Lorsung¹, Joseph Frank¹, and Scott Burks¹¹NIH Clinical Center, Bethesda, MD

FR-633

Engineering of Mature Human Induced Pluripotent Stem Cell-Derived Cardiomyocytes using Substrates with Multi-Scale TopographyParisa Abadi^{1,2}, Jessica Garbern³, Shahed Behzadi², Michael Hill¹, Jason Tresback⁴, Tiam Heydari⁵, Mohammad Reza Eftehadi⁵, Nafis Ahmed³, Elizabeth Copley², Haniyeh Aghaverdi², Richard Lee³, Omid Farokhzad², and Morteza Mahmoudi²¹Michigan Technological University, Houghton, MI, ²Brigham and Women's Hospital, Harvard Medical School, Boston, MA,³Harvard Stem Cell Institute, Harvard University, Cambridge, MA,⁴Center for Nanoscale Systems, Harvard University, Cambridge, MA,⁵Sharif University of Technology, Tehran, Iran

Friday, October 19 | 9:30 am–5:00 pm | GWCC Exhibit Hall

Poster Viewing with Authors & Refreshment Break | 9:30 am–10:15 am and 2:45 pm–3:30 pm

FR-634

Modulation of Axon Extension and Matrix Proteolysis by Matrix Based Peptide Signaling

T. Hiran Perera¹ and Laura Smith Callahan¹
¹UT Health, Houston, TX

FR-635

The Effect of Piezoelectric Zinc Oxide Composite Scaffold on Mesenchymal Stem Cells in Dynamic Loading Conditions

Ateka Khader¹ and Treena Arinzeh¹
¹New Jersey Institute of technology, Newark, NJ

FR-636

Dynamic Modulation of Gelatin Methacrylate Hydrogels to Mature Human Stem Cell-Derived Cardiac Tissues

Gulistan Tansik¹, Ahmad Alassaf¹, Vera Mayo¹, Diana Velluto¹, and Ashutosh Agarwal¹
¹University of Miami, Miami, FL

FR-637

Wnt16 is Expressed Downstream of Non-canonical Wnts during Osteoblastic Differentiation on Microroughened Surfaces

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¹Virginia Commonwealth University, Richmond, VA, ²Georgia Institute of Technology, Atlanta, GA, ³University of Texas Health Science Center at San Antonio, San Antonio, TX

FR-638

Nanopatterned Control Over Cell Cytoskeletal Organization and Fate

Brian Meckes¹, Maria Cabezas¹, Milan Mrksich¹, and Chad Mirkin¹
¹Northwestern University, Evanston, IL

FR-639

Engineering Microenvironments Towards Harnessing Pro-angiogenic Potential of Mesenchymal Stem Cells

Malak Nasser¹, Yang Wu¹, and Gargi Ghosh¹
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FR-640

The Synergy Peptide PHSRN Promotes Efficient Differentiation of Mouse Embryonic Stem Cells into Mesodermal Lineage

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Track: Stem Cell Engineering, Cellular and Molecular Bioengineering

Reprogramming/Directed Differentiation in Stem Cell Engineering

FR-641

Testing the Potential of Deactivated DNA Methyltransferase 1 for Epigenetic Editing

Julien Morival¹ and Timothy Downing¹
¹University of California, Irvine, Irvine, CA

FR-642

A Novel Reprogramming Method for Neural Regeneration

Kali Scheck¹, Meghan Robinson¹, and Stephanie Willerth¹
¹University of Victoria, Victoria, BC, Canada

FR-643

A Fully Defined Approach for Differentiating Human Induced Pluripotent Stem Cells Into Blood-Brain Barrier Endothelial Cells With In Vivo Like Properties

Emma Neal¹, Dalton Gullett¹, Kylie Balotin¹, Yajuan Shi¹, Kevin Ess², John Wikswo¹, Aaron Bowman², and Ethan Lippmann¹
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FR-644

Non-Viral Gene Delivery of HIF-1 α to Adipose-Derived Stem Cells to Promote Angiogenesis

Savannah Witte¹, Stephany Tzeng¹, Ashley Farris¹, Daphne Hutton¹, Kunal Parikh¹, Warren Grayson¹, and Jordan Green¹
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Track: Stem Cell Engineering

Stem Cell Engineering-Other/Non-specified

FR-645

In Silico-Augmented Cardiac Microphysiological Systems for Evaluating Cardiac Drug Effects

Samuel Wall¹, Karoline Jæger¹, Nathaniel Huebsch², Bernice Charraz², Kevin Healy², and Aslak Tveito¹
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Track: Bioinformatics, Computational and Systems Biology, Cellular and Molecular Bioengineering

Single-Cell Measurements and Models

FR-646

Integrated Measurements of Proteins and Transcripts from Single Cells Enabled by a DNA Encoding Strategy

Alexander Xu^{1,2}, Kelly Liu², Yapeng Su², Kaitlyn Takata², Sarah Jeoung², and James Heath^{1,2}
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FR-647

A Modeling and Experimental Investigation of the Correlation between Cell size and Nanoparticle Uptake at the Single-Cell Level

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¹Missouri University of Science and Technology, Rolla, MO

FR-648

Predictive Computational Model of Microfluidic Deformability Cytometry

Scott Hymel¹, Hongzhi Lan², Zhongyi Sheng¹, Peyton Gibley¹, and Damir Khismatullin¹
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FR-649

Calcium Influx Enhances TRAIL-Mediated Apoptosis of Cancer Cells

Jacob Hope¹, Emily Lederman², and Michael King¹
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FR-650

A Hybrid Continuum-Structural Model to Understand Flow Induced Endothelial Cell Alignment

Nathaniel Witt¹ and Julie Ji²
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²Indiana University-Purdue University Indianapolis, Indianapolis, IN

Track: Stem Cell Engineering, Bioinformatics, Computational and Systems Biology

Stem Cell Systems Biology & Bioinformatics

FR-651

A Computational Approach to Enhance iPSC-derived Cardiomyocyte Cell Manufacturing

Dennis Norfleet¹, Joshua Lewis¹, and Melissa Kemp¹
¹Georgia Institute of Technology, Atlanta, GA

FR-652

Characterizing the Relationship Between Mesenchymal Stem Cell Sphingolipids and Immunomodulatory Potential

Ciara Dean^{1,2}, Nathan Chiappa¹, and Edward Botchwey¹
¹Georgia Institute of Technology, Atlanta, GA, ²Coretta Scott King Young Women's Leadership Academy, Atlanta, GA

FR-653

Investigating the FGF2- and IGF1- Mediated Signaling on Human Epidermal Interfollicular Neural Crest Stem Cells Utilizing Experimental and Bioinformatics Approaches

Georgios Tseropoulos¹, Samaneh Moghadasi Boroujeni², Vivek Bajpai³, and Stylianos Andreadis⁴
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³Stanford School of Medicine, Pasadena, CA, ⁴University at Buffalo, Amherst, NY

FR-654

Computational Approaches in Subcellular and Cellular Level for Analyzing the Neuronal Differentiation on PCL-Graphene Scaffolds.

Qi Wu¹, Pegi Haliti¹, Bhushan Dharmadhikari¹, and Prabir Patra¹
¹University of Bridgeport, Bridgeport, CT

Track: Tissue Engineering

Engineering Tissue Interfaces

FR-655

Understanding the Nanotopographical Modulation of Stem Cell Behavior

Kai Wang¹, Jiafeng Liu¹, Kun Man¹, and Yong Yang¹
¹University of North Texas, Denton, TX

FR-656

Effects of Nanoparticle Types on the Enhanced Tissue Adhesion of Mussel Inspired Nanocomposites

Nikhil Pandey¹, Luis Soto¹, Andres Urias¹, Valinda Jones¹, Jun Liao¹, Philippe Zimmern², Kytai Nguyen¹, and Yi Hong¹
¹University of Texas at Arlington, Arlington, TX, ²UT Southwestern, Dallas, TX

FR-657

Reciprocity between Nanogrooved Substrate-Mediated Muscle Maturity and Neurons toward Neuromuscular Junction Formation

Eunkyung Ko¹, Seung Jung Yu², Gelson Pagan-diaz¹, Ziad Mahmassani¹, Marni Boppart¹, Sung Gap Im², Rashid Bashir¹, and Hyunjoon Kong¹
¹University of Illinois at Urbana-Champaign, Urbana, IL,
²Korea Advanced Institute of Science and Technology, Daejeon, Korea, Republic of

FR-658

Highly Transparent Bioadhesive Hydrogels for Sealing and Treatment of Corneal Defects

Ehsan Shirzaei Sani¹, Ahmad kheirkhah², Devyesh Rana¹, William Foulsham², Zhongmou Sun², Amir Sheikhi³, Afsaneh Amouzegar², Ali Khademhosseini³, Reza Dana², and Nasim Annabi⁴
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Track: Biomechanics, Tissue Engineering

Biomechanics in Cell and Tissue Engineering

FR-659

Numerical Modeling of Effect of Thermal Properties on Unidirectional Solidification in Freeze-Cast Chitosan-Alginate Scaffold Fabrication for Tissue Engineering

Amir Rouhollahi¹, Stephen Florczyk¹, and Olusegun Ilegbusi¹
¹University of Central Florida, Orlando, FL

FR-660

Numerical Modeling of Mold Geometrical Properties Effect on Unidirectional Solidification in Freeze-Cast Chitosan-Alginate Scaffold Fabrication for Tissue Engineering

Amir Rouhollahi¹, Stephen Florczyk¹, and Olusegun Ilegbusi¹
¹University of Central Florida, Orlando, FL

FR-661

Biomechanical Characterization of Engineered Dermal-Equivalent Tissues

Erin Drewke¹, Ting-Wei Law¹, Melville Vaughan¹, and Gang Xu¹
¹University of Central Oklahoma, Edmond, OK

FR-662

Development of Macroenvironment and Testing Platform for Long-term Survivability of Bone Tissue

Anirban Chakraborty¹ and Anamika Prasad¹
¹South Dakota State University, Brookings, SD

FR-663

Spatial Pattern of New Matrix Deposition Controls the Micromechanics of Engineered Cartilage

Jill Middendorf¹, Sonya Shortkroff², Caroline Dugopolski², Stephen Kennedy², Eric Blahut², Itai Cohen¹, and Lawrence Bonassar¹
¹Cornell University, Ithaca, NY, ²Histogenics Corporation, Waltham, MA

FR-664

Assembly of a Pulsatile Flow Bioreactor System to Facilitate Oscillatory-flow Conditions to Optimize In Vitro Engineered Valve Tissue Growth

Chia-Pei Denise Hsu¹, Manuel Perez-Nevarez¹, Elnaz Pour Issa¹, Maria Montesinos¹, Brittany Gonzales¹, Alejandro Pinerol¹, and Sharan Ramaswamy¹
¹Florida International University, Miami, FL

FR-665

The Role of Dynamic Compression on Growth Plate Chondrocyte Stiffness

Donghee Lee¹, Alek Erickson¹, Sangjin Ryu², and Andrew T. Dudley¹
¹University of Nebraska Medical Center, Omaha, NE, ²University of Nebraska-Lincoln, Lincoln, NE

FR-666

Dynamic Mechanics of Microtissues Investigated Using a Novel Vacuum Actuated Stretcher

Matthew Walker¹, Michel Godin¹, and Andrew Pelling¹
¹University of Ottawa, Ottawa, ON, Canada

FR-667

Measuring Internal Stiffness Patterns in Live 3D Tissues Using Smart Material Microprobes

Stephanie Mok¹, Sara Al-Habyan², Wontae Lee¹, Luke McCaffrey², and Christopher Moraes^{1,2}
¹McGill University, Montreal, QC, Canada, ²Goodman Cancer Research Center, Montreal, Canada

FR-668

Emergence of Phase Separation in Cell Distribution in 3D Biomimetic Tissue

Umnia Doha¹, M. Taher A. Saif¹, and Mohamed Elheberay¹
¹University of Illinois at Urbana Champaign, Urbana, IL

FR-669

Shear Characterization of the Patellar Tendon

Ryan Rosario¹, Callan Luetkemeyer¹, Rhima Coleman¹, and Ellen Arruda¹
¹University of Michigan, Ann Arbor, MI

FR-670

Probing the Influence of Substrate Stiffness on Pericyte Traction

Todd Condon Jr.¹ and Robert Steward Jr.¹
¹University of Central Florida, Orlando, FL

FR-671

Plug 'N Play: Induction of Biomimetic and Hierarchical Angiogenesis Under Stimulation With S1P

Justin Buro¹, Andrew Abadeer¹, Karel-Bart Celie¹, Yoshiko Toyoda¹, Alexandra Lin¹, Daniel Lara¹, Arash Samadi¹, Matthew Wright¹, and Jason A. Spector¹
¹Weill Cornell Medical College, New York, NY

FR-672

Autonomous Alignment of Mesenchymal Cells Mediated by Cell-Cell and Cell-Matrix Interactions

Tianfa Xie¹ and Yubing Sun¹
¹University of Massachusetts Amherst, Amherst, MA

FR-673

Biomechanical Characterization of Neonatal Porcine Heart Atria

Karla Perez¹, Brant Shipferling¹, Katherine McGrath Copeland¹, Akhil Chaudhari¹, Sara McMahan¹, Sammira Rais-Rohani², Lakiesha Williams², Pietro Bajona³, Ge Zhang⁴, Yi Hong¹, and Jun Liao¹
¹University of Texas at Arlington, Arlington, TX, ²Mississippi State University, Mississippi State, MS, ³University of Texas Southwestern Medical Center, Dallas, TX, ⁴University of Akron, Akron, OH

FR-674

Curling Angle Measurement of LV Bi-layered Surface Strip Reveals Residual Stress in the Epicardium

Xiaodan Shi^{1,2}, Yue Liu³, Katherine Copeland¹, Sara McMahan¹, Song Zhang², Ryan Butler², Yi Hong¹, Michael Cho¹, Pietro Bajona⁴, Huajian Gao³, and Jun Liao¹
¹University of Texas at Arlington, Arlington, TX, ²Mississippi State University, Mississippi State, MS, ³Brown University, Providence, RI, ⁴University of Texas Southwestern Medical Center, Dallas, TX

FR-675

A New Traction Force Microscopy Platform for Simple Measurement of 3D Cellular Traction Forces

Omar Banda¹, Ryan Taitano¹, and John Slater¹
¹University of Delaware, Newark, DE

FR-676

A Robotic Platform to Study Mechanobiology of Fibrous Tissue Reconstruction

Erik Mailand¹, Jeroen Eyckmans², and Mahmut Selman Sakar¹
¹École Polytechnique Fédérale de Lausanne (EPFL), Lausanne, Switzerland, ²Boston University, Boston, MA

FR-677

Rheological Characterization of Sodium Alginate Castings for Breast Tissue Engineering

Alberta Kovatcheva¹, Vittoria Flamini¹, Kalle Levon¹, Freya Schnabel², and Nolan Karp²
¹New York University, Brooklyn, NY, ²New York University Langone Medical Center, New York, NY

FR-678

Probing the Effects of Substrate Stiffness on Astrocytes Mechanics

Ariege Bizanti¹ and Robert Steward¹
¹Burnett School of Biomedical Sciences, College of Medicine, University of Central Florida, Orlando, FL

FR-679

Biomechanical Characterizations of The Neonatal Porcine Pulmonary Artery and Aorta

Sara McMahan¹, Katherine McGrath-Copeland¹, Xiaodan Shi¹, Alan Taylor¹, Brant Shipferling¹, Sammira Rais-Rohani², Lakiesha Williams², Yi Hong¹, Ge Zhang³, Pietro Bajona⁴, and Jun Liao¹
¹University of Texas at Arlington, Arlington, TX, ²Mississippi State University, Mississippi State, MS, ³University of Akron, Akron, OH, ⁴University of Texas Southwestern Medical Center, Dallas, TX

FR-680

Biophysical Separation of iPSC Derived Retinal Cells for Regenerative Medicine Applications

Nicholas Stone¹, Budd Tucker², and Todd Sulchek¹
¹Georgia Institute of Technology, Atlanta, GA, ²University of Iowa Carver College of Medicine, Iowa City, IA

Track: Cellular and Molecular Bioengineering

Ligand, Receptor, and Effector Signaling Systems

FR-681

Non-invasive Control Over Cell Signaling Via the Conjugation of Latent Transforming Growth Factor-Beta 1 To Magnetic Nanoparticles

Obiora Azie¹, Zachary Greenberg¹, Adam Monsalve¹, and Jon Dobson¹
¹University of Florida, Gainesville, FL

FR-682

Nano-vesicles From Macrophages Exposed to Diabetic Milieu Exacerbates Cardiac Fibrosis Response

Prem Kumar Govindappa¹, Gangjian Qin¹, Jianyi Zhang¹, and Prasanna Krishnamurthy¹
¹UAB-The University of Alabama at Birmingham, Birmingham, AL

FR-683

A Quartz Crystal Microbalance Based Study Unveils Integrin-RGD Dynamics During Early Cell Adhesion Events

Kshitij Amar¹, Ian Suni¹, and Farhan Chowdhury¹
¹Southern Illinois University, Carbondale, IL

FR-684

Differential Signaling Between Beta-1 and Beta-2 Integrins Drives Distinct T-cel Migratory Behaviors

Nathan Roy¹, Alexander Buffone, Jr.², Sangya Agarwal², Daniel Hammer², and Janis Burkhardt¹
¹Childrens Hospital of Philadelphia, Philadelphia, PA, ²University of Pennsylvania, Philadelphia, PA

FR-685

Synthetic Biology Framework for Engineering Post-Translational Circuits

Nichole Daringer¹, Caleb Bashor², and James Collins¹
¹Massachusetts Institute of Technology, Cambridge, MA, ²Rice University, Houston, TX

FR-686

Can We Determine Protein Interaction Affinity without Purification?

Jiayu Liao¹, Zhehao Xiong¹, and Ling Jiang^{1,2}
¹UCR, Riverside, CA, ²Heilongjiang University of Chinese Medicine, Harbin, Heilongjiang, China, People's Republic of

FR-687

Inhibition of Cellular Glycogen Synthase Kinase-3 (GSK-3) Activity via a Novel Compound

Mahboubeh Noori¹, Chaz Cuckler¹, Maria Courreges¹, Stephen Bergmeier¹, Kelly McCall¹, and Douglas Goetz¹
¹Ohio University, Athens, OH

FR-688

Cadherin-11 Cooperates with Platelet Derived Growth Factor Receptor Beta to Regulate Fibroblast Growth Via AKT Pathway

Yayu Liu¹, Sindhu Row¹, and Stelios Andreadis¹
¹University at Buffalo, Buffalo, NY

FR-689

Targeting HIV Envelope Protein GP-120 with Lectins

Butaek Lim¹, LeNaiya Kydd¹, and Justyn Jaworski¹
¹UT at Arlington, Arlington, TX

Track: Cellular and Molecular Bioengineering

Cellular and Molecular Bioengineering—Other/Non-specified

FR-690

Reprogramming of Liver Cell Lines to Definitive Endoderm by Understanding and Re-engineering Developmental Master Regulatory Gene Circuits (DRGC)

Saber Meamardoost¹ and Natesh Parashurama¹
¹University at Buffalo, The State University of New York, Buffalo, NY

FR-691

Using an In Vitro Uremic Model to Determine the Effects of Fetuin-A on Vascular Calcification

Jenna Mosier¹, Rachel Hybart¹, Virginia Mullins¹, and C. LaShan Simpson¹
¹Mississippi State University, Mississippi State, MS

FR-692

A High Fat Meal Alters Oxylipin Composition in Triglyceride-rich Lipoprotein to Modulate Endothelial Inflammatory Phenotype

Anita Rajamani¹, Kamil Borkowski², Samir Akre¹, Andrea Fernandez¹, John Newman¹, Scott Simon¹, and Anthony Passerini¹
¹University of California, Davis, Davis, CA

FR-693

An Achiral Peptoid Reduces RAGE Expression and Attenuates Inflammatory Response: A Potential Therapeutic for Alzheimer's Disease

Lauren Wolf¹, Shannon Servoss², and Melissa Moss¹
¹University of South Carolina, Columbia, SC, ²University of Arkansas, Fayetteville, AK

FR-694

Altered Insulin Vesicle Dynamics in Response to non-invasive Electrical Stimulation

Caleb Liebman¹, Thao-Mi Vu¹, and Michael Cho¹
¹University of Texas at Arlington, Arlington, TX

FR-695

Utilization of Sclerostin as a Potential Therapeutic for Vascular Calcification

Lindsay Rexrode¹, Kelsey McArthur¹, and C. LaShan Simpson¹
¹Mississippi State University, Starkville, MS

FR-696

Discovery of SUMOylation Inhibitor as a Novel Antiviral Agent Against Influenza A Virus

Zhehao Xiong¹, Yang Song¹, and Jiayu Liao¹
¹University of California, Riverside, Riverside, CA

FR-697

Potential Mechanism for Synergistic Cytotoxicity of TRA-8 and Tamoxifen in ER-positive MCF-7 Breast Cancer Cells

Romone Fancy¹, Tiara Napier¹, Qinghua Zeng¹, Donald Buchsbaum¹, Catherine Parker¹, and Yuhua Song¹
¹University of Alabama at Birmingham, Birmingham, AL

FR-698

High Intensity, 5 ns Electric Pulses Mobilize Ca 2+ from Two ER Stores in Adrenal Chromaffin Cells

Josette Zaklit¹, Indira Chatterjee¹, Normand Leblanc², and Gale L. Craviso²
¹University of Nevada, Reno, Reno, NV, ²University of Nevada, Reno School of Medicine, Reno, NV

Track: Nano and Micro Technologies

Micro/Nano Tools for Immune Engineering

FR-699

Responsive Two-Fluorophore Reporter System: A Potential Tool to Monitor Particulate Vomocytosis

Noah Pacifici¹, Amir Bolandparvaz¹, Roberta Stilhano^{1,2}, Shahin Shams¹, Eduardo Silva¹, and Jamal Lewis¹
¹UC Davis, Davis, CA, ²Federal University of Sao Paulo, Sao Paulo, Brazil

FR-700

Self-adjuvanting α -Helical Peptide Nanofibers Promote High-quality Antibody Responses

Yaoying Wu¹, Sean Kelly¹, Austin Kotas¹, Kendra Congdon¹, Luis Sanchez-Perez¹, John Sampson¹, and Joel Collier¹
¹Duke University, Durham, NC

FR-701

Development of an Extracorporeal Flow System for Cytokine Capture in Cardiopulmonary Bypass

Adam Monsalve¹, Olivia Lanier¹, Samuel Warnock¹, John Vicente¹, and Jon Dobson¹
¹University of Florida, Gainesville, FL

FR-702

Nanoscale Tools for Novel Mitochondrial DNA Single-Nucleoid Analysis

Midori Maeda¹, Joyce Hanching Chiu¹, and Shuichi Takayama¹
¹Georgia Institute of Technology, Atlanta, GA

FR-703

Immune Cell Motility in Microfluidic Flow-free Chemokine Gradients

Utku Sonmez¹, Lance Davidson², Pawel Kalinski³, and Philip LeDuc¹
¹Carnegie Mellon University, Pittsburgh, PA, ²University of Pittsburgh, Pittsburgh, PA, ³University of Buffalo, Buffalo, NY

FR-704

Screening Immunotherapies in Polymer Solution Microreactors: System Evaluation and Optimization

Alyne Teixeira¹, Jun Wang¹, and John Frampton¹
¹Dalhousie University, Halifax, NS, Canada

Track: Nano and Micro Technologies

Micro/Nano Tools for Infectious Diseases

FR-705

An Advanced Micro-Nano Device for Enrichment of Plant Pathogenic Viruses

Wen-Long Zhang¹, Mackenzie Maurer¹, Zhao-Wei Liu², Vessela Mavrodieva², and Si-Yang Zheng¹
¹Penn State University, University Park, PA, ²USDA, APHIS, PPO, CPHST-Beltsville Laboratory, Beltsville, MD

FR-706

Preliminary Investigations of a Chemoselective Microfluidic System Incorporating Light Scattering For Virus-Like Particle Detection

Erin Fincher¹, Sarah Maclean¹, Brian Geiss¹, and Kevin Lear¹
¹Colorado State University, Fort Collins, CO

FR-707

Detection by Death: A Rapid Way to Detect Viable Microbes with Slow Metabolisms (Long Doubling Times)

Shramik Sengupta¹, Roli Kargupta¹, Yongqiang Yang¹, Aiden Lee¹, and Sachidevi Puttaswamy¹
¹University of Missouri, Columbia, MO

FR-708

Rapid (Direct from Sample) Drug/Antibiotic Susceptibility Testing

Shramik Sengupta¹, Sachidevi Puttaswamy¹, Yongqiang Yang¹, Timothy Butler¹, and Aiden Lee¹
¹University of Missouri, Columbia, MO

FR-709

Microscale Magnetic Levitation for The Multiplexed Analysis Of Malaria-infected Blood in Resource-limited Settings

Shreya Deshmukh¹, Anna Chen², Naside Gozde Durmus¹, Kaushik Sridhar¹, Bryan Greenhouse², Elizabeth Egan¹, and Utkan Demirci³
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FR-710

Washburn Analysis of Aqueous Two-Phase System Separation in Porous Media

So Youn Lee¹, David Pereira¹, Chloe Wu¹, Benjamin Wu¹, and Daniel Kamei¹
¹University of California, Los Angeles, CA

FR-711

Design of a High-Gradient Magnetic Separator for Improved TB Diagnosis

Stephanie I. Pearlman¹, Cassandra Wessely¹, Anna Wolfe¹, Megan E. Pask¹, Lejla Pasic¹, Raymond Mernaugh, Ph.D.¹, and Frederick R. Haselton¹
¹Vanderbilt University, Nashville, TN

FR-712

Single Nucleotide Polymorphism Discrimination for Antimalarial Resistance Testing Directly in Blood

Mindy Leelawong¹, Nicholas Adams¹, William Gabella¹, David Wright¹, and Frederick Haselton¹
¹Vanderbilt University, Nashville, TN

FR-714

Point-of-Care Detection of Bacterial Viability using Dynamic Laser Speckle Imaging

Ritvik Muralidharan¹, Joshua Noble¹, Chen Zhou¹, Zhiwen Liu¹, and Aida Ebrahimi¹

¹Penn State University, University Park, PA

FR-715

Detecting RNA Viruses with No Sample Preparation Using RT-PCR Controlled by Mirror-Image L-DNA

Nicholas Adams¹, Erin Euliano¹, Anna Wolfe¹, Christa Victoriano¹, Austin Hardcastle¹, William Gabella¹, and Frederick (Rick) Haselton¹

¹Vanderbilt University, Nashville, TN

Track: Nano and Micro Technologies, Translational Biomedical Engineering

Micro/Nano Tools in Medicine

FR-716

Protease Resistant Protein Formulations for the Healing of Chronic Wounds

Tabitha Boeringer¹, Lisa Gould², and Piyush Koria¹

¹University of South Florida, Tampa, FL, ²South Shore Hospital for Wound Healing, Weymouth, MA

FR-717

A Tortuosity-Activated Microfluidic Device for Rapid Quantitative Assessment of Anticoagulation Therapy in Pediatric Patients on Life Support Systems

David Luna¹, Tanmay Mathur¹, Justin Bui¹, Pranav Gadangi¹, Jun Teruya², and Abhishek Jain¹

¹Texas A&M University, College Station, TX, ²Texas Childrens Hospital, Houston, TX

FR-718

Photothermally Triggered Thermoplastic Shape Memory Polymeric Particles for Biomedical Applications

Randall Meyer¹, Qiongyu Guo¹, Corey Bishop¹, David Wilson¹, Lauren Olasov¹, Daphne Schlesinger¹, Patrick Mather², James Spicer¹, Jennifer Elisseeff¹, and Jordan Green¹

¹Johns Hopkins University, Baltimore, MD, ²Bucknell University, Lewisburg, PA

FR-719

A Novel Synthetic Artificial Cornea with Biomimetic Nanotopography, from Device Fabrication to Animal Study

Junming Cai¹, Kate Xie¹, Elena Liang¹, Priscilla Vu¹, Steven Carter¹, Albert Yee¹, and Marjan Farid¹

¹University of California, Irvine, Irvine, CA

FR-720

Cardioprotection with Proangiogenic Nanomaterials Formulated with CHIR99021

Chengming Fan¹, Yasin Oduk¹, Meng Zhao¹, Yawen Tang¹, Gregory P. Walcott¹, Wuqiang Zhu¹, and Jianyi Zhang¹

¹Department of Biomedical Engineering, the University of Alabama at Birmingham, Birmingham, AL

Track: Nano and Micro Technologies, Neural Engineering

Micro/Nano Tools in Neurosciences

FR-721

New Model of Microelectrode Array for Precise Electric Field Design in Brain Tissue Studies

Benjamin Schwartz¹, Shaun Brown¹, Jonathan Duncan¹, Arati Sridharan¹, and Jitendran Muthuswamy¹

¹Arizona State University, Tempe, AZ

FR-722

Towards Long Term Self-Powered Neural Recording in Freely Behaving Organisms

Darshit Mehta¹, Liang Zhou¹, Mike Traner¹, Debajit Saha¹, Baranidharan Raman¹, and Shantanu Chakrabarty¹

¹Washington University in St Louis, Saint Louis, MO

FR-723

Non-invasive Neural Stimulation Enabled by Piezoelectric Nanoparticles and Ultrasound

Tomas Jordan¹, Scott Alpizar¹, Michael Hoppa¹, and Geoffrey Luke¹

¹Dartmouth College, Hanover, NH

FR-724

Materials and Technologies for Soft and Multimodal Neural Interfacing

Xiaojie Duan¹, Siyuan Zhao¹, Rongkang Yin¹, Zheng Xu¹, Jing Zhang¹, Linlin Lu¹, and Xuefeng Fu¹

¹Peking university, Beijing, China, People's Republic of

FR-725

Incubation Unit and Micro Force Applicator for In Vitro Microbrain Mechanical Injury

Norah Cowley¹, Alexander Almeida¹, Jenna Taormina¹, Bianca Wyman¹, Min Tang-Schomer², David Kaplan³, and Kazunori Hoshino¹

¹University of Connecticut, Storrs, CT, ²University of Connecticut Health Center, Farmington, CT, ³Tufts University, Medford, MA

FR-726

Touch-evoked Mechanical Strain in C. elegans Sensory Neurons

Adam Nekimken¹, Miriam B. Goodman¹, and Beth L. Pruitt^{1,2}

¹Stanford University, Stanford, CA, ²UC Santa Barbara Santa Barbara, CA

FR-727

Neuro-Needle Brain Deformation Quantification by Magnetic Sensor System

Anirvan Komath Majumdar¹, Sayemul Islam¹, Sai Teja Reddy Gidde¹, Byoung Gook Loh², Parsaoran Hutapea¹, and Albert Kim¹

¹Temple University, Philadelphia, PA, ²Hansung University, Seoul, Korea, Republic of

FR-728

Conducting Polymer Coatings for Improved Neural Adhesion And Measurements in 3D Tissue Models

Bilal Haider¹, Holden Fried¹, Mattia Bonzanni¹, Emily Peirent¹, and Brian Timko¹

¹Tufts University, Medford, MA

FR-729

Label-Free All-Optical Electrophysiology with Plasmonic Nanoantenna

Ahsan Habib¹, Xiangchao (Jude) Zhu¹, Maverick McLanahan¹, and Ahmet Ali Yanik¹

¹University of California, Santa Cruz, Santa Cruz, CA

FR-730

Development of 3D Amine Functionalized Carbon Nanotube Scaffolds for Mesenchymal Stem Cell Neural Differentiation

Se-Jun Lee¹, Xuan Zhou¹, Haitao Cui¹, Yi Zuo², and Lijie Zhang¹

¹George Washington University, Washington, DC, ²University of Hawaii at Manoa, Honolulu, HI

FR-731

Develop Human iPSC-Derived *In Vitro* Blood-Brain Barrier Model

Seokyoung Bang¹, Kathy Chu¹, Bin Duan¹, Mitchell Kuss¹, Noo Li Jeon², Byungjun Lee², and Hyung Joon Kim¹

¹University of Nebraska Medical Center, Omaha, NE, ²Seoul National University, Seoul, Korea, Republic of

Track: Cancer Technologies, Nano and Micro Technologies

Microscale Cancer Cell Analysis

FR-732

Nanoscale Approaches to Study and Target Myeloid-Derived Suppressor Cells in Cancer

Silvia Duarte-Sanmiguel¹, Brooke Benner¹, Natalia Higueta-Castro¹, Nicholas Idzkowski¹, Vashuda Shukla¹, Gina Guido-Vega¹, Daniel Cary¹, William E Carson¹, and Daniel Gallego-Perez¹

¹The Ohio State University, Columbus, OH

FR-733

Feasibility of Ablating Colorectal Cancer Liver Metastasis via Site-Specific Image Guided Magneto-Plasmonic Nanoparticle Delivery and Photothermal Ablation

Mir Hadi Razeghi Kondelaji^{1,2}, Abdul Kareem Parchur¹, Venkat Gogineni¹, Sarah B Sarah B White¹, and Amit Joshi¹

¹Medical College of Wisconsin, Milwaukee, WI, ²Marquette University, Milwaukee, WI

Track: Bioinformatics, Computational and Systems Biology

Models of Metabolism

FR-734

Genome-Scale Metabolic Modeling Identifies Optimal Nutrient-Limiting Conditions Based On Cell Type And Cellular Objective

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FR-735

A Dynamical Model of Lignin Biosynthesis in *Brachypodium Distachyon*

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Track: Cellular and Molecular Bioengineering, Biomechanics

Molecular Bioengineering

FR-736

Characterization of the Binding Affinity between the Lynx Protein and the Neuronal Nicotinic Acetylcholine Receptors

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FR-737

The Role of Transcription Factors in Drug-Drug Interactions

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FR-738

Development of a Microfluidic Bleeding Chip- A Tool to Assess Hemostasis

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FR-739

Stabilization of the Hinge Region in Human E-selectin Enhances Binding Affinity to Ligands Under Force

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FR-740

Engineering a Superior VEGF Antagonist to Reverse Ocular Diseases

Rakeeb Kureshi¹, Jonah Rosas¹, Michelle Treppe¹, Kristen Nixon¹, and Jamie Spangler¹

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FR-741

***In Vivo* Labeling and Enrichment of Newly Synthesized Proteins During Embryonic Development**

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Track: Biomechanics**Brain Biomechanics**

FR-742

Micromechanical Heterogeneity of the Rat Pia-arachnoid Complex: An AFM StudyGloria Fabris¹, Zeynep Suar¹, and Mehmet Kurt^{1,2}
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FR-743

The Biomechanical Response of a PMHS Brain to Two Rotational inputs.Allison Guettler¹ and Warren Hardy¹
¹Virginia Tech, Blacksburg, VA

FR-744

Kinetic Energy Parameters to Scale Traumatic Brain Injury Biomechanics Across Head Rotational PlanesKathryn Wofford^{1,2,3}, Kevin Browne^{2,3}, Carolyn Keating^{2,3}, James Harris², and Kacy Cullen^{2,3}
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FR-745

Characterization of a Transversely Isotropic Hyperelastic Model for CNS White MatterYi Pan¹, Assimina Pelegri¹, and David Shreiber¹
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FR-746

Frequency Domain Analysis of Shear Deformation in the BrainMarie Rice¹, Ellen Arruda¹, and Michael Thouless¹
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FR-747

On the Formation and Pattern Selection of 3-hinge Gyri in Cortical FoldingMir Jalil Razavi¹, Tuo Zhang², Tianming Liu¹, and XQ Wang¹
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FR-748

Regional Brain Tissue Strain Quantification in Chiari Malformation using DENSE MRIBlaise Simplicite Nwotchouang¹, Soroush Heidari Pahlavian¹, John Oshinski², Xiaodong Zhong², Francis Loth¹, and Rouzbeh Amini¹
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FR-749

A Nerve-integrated 3D Tissue on a Chip System to Study the BrainJustin Bobo¹, Zara Weinberg², Manoj Puthenveedu², and Philip LeDuc¹
¹Carnegie Mellon University, Pittsburgh, PA, ²University of Michigan, Ann Arbor, MI

FR-750

A Study of Mesh Convergence Behavior and Element Integration Scheme of a Head Injury ModelWei Zhao¹ and Songbai Ji¹
¹Worcester Polytechnic Institute, Worcester, MA**Track: Neural Engineering****Neural Decoding and Control**

FR-751

Advances in Shared Human-Machine Control for Upper Limb ProsthesesTaylor C. Hansen¹, Henrique Dantas², Jacob G. Nieveen¹, Jacob A. George¹, Gregory A. Clark¹, David J. Warren¹, and V John Mathews²
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FR-752

Decoding the Hedonic Value of a Sensory StimulusRishabh Chandak¹ and Baranidharan Raman¹
¹Washington University in St. Louis, St Louis, MO

FR-753

Simulating Functional Neural Stimulation on OpenSim Biomechanical Models With Nonlinear Model Predictive ControlW. Mitchel Thomas¹, Leonardo Cavalcanti², Henrique Dantas², David Warren¹, and V. John Mathews²
¹University of Utah, Salt Lake City, UT, ²Oregon State University, Corvallis, OR

FR-754

Developing Freely-moving, Insect-based, Biorobots for Chemical Sensing in Natural EnvironmentsDebajit Saha¹, Darshit Mehta¹, Shantanu Chakrabartty¹, and Baranidharan Raman¹
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FR-755

Brain Activation Pattern Analysis for Speech Production Decoding from MEG SignalsDebadatta Dash¹, Myungjong Kim¹, Paul Ferrari², and Jun Wang¹
¹University of Texas at Dallas, Richardson, TX, ²University of Texas at Austin, Austin, TX**Track: Neural Engineering****Neural Device Interfaces**

FR-756

Evaluation of Thiol-ene/Acrylate Shape Memory Polymer as a Substrate for Intracortical MicroelectrodesAndrew Shoffstall^{1,2}, Melanie Ecker³, Allison Stiller³, Vindhya Danda³, Walter Voit³, Joseph Pancrazio³, and Jeffrey Capadona^{1,2}
¹Case Western Reserve University, Cleveland, OH, ²Northeast Ohio VA Health System, Cleveland, OH, ³The University of Texas at Dallas, Dallas, TX

FR-757

Liquid Crystal Elastomers as a Novel Material for Neural InterfacesRashed Rihani¹, Hyun Kim¹, Joseph Pancrazio¹, and Taylor Ware¹
¹University of Texas at Dallas, Richardson, TX

FR-758

Flexible Parylene Probes with Multilayer Microelectrodes to Improve Recording Potential for Spinal Cord Injury Treatment

Xin Liu¹, Sunshine Littlecreek¹, Hilton Kaplan¹, Joachim Kohn¹, David Shreiber¹, and Jeffrey Zahn¹
¹Rutgers University, Piscataway, NJ

FR-759

A Novel Device for Real-time Measurement and Manipulation of Licking Behavior in Head-fixed Mice

Brice Williams¹, Anderson Speed¹, and Bilal Haider¹
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FR-760

High Sensitivity Microelectrode Probe for Glutamate Detection in Real Time

P. Timothy Doughty¹, Chao Tan¹, Nicholas Udstad¹, Chelsea Pernici¹, Shabnam Siddiqui², Prabhu Arumugam^{1,2}, and Teresa Murray^{1,2}
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FR-761

Development of Thermocompression Bonded Parylene Microchannels for Microfluidic Neural Probes

Xuechun Wang¹, Ahuva Hirschberg¹, Kee Scholten¹, and Ellis Meng¹
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FR-762

Real-Time Detection of Glutamate Dysregulation with High-Sensitivity Microelectrode

Teresa Murray¹, Jessica Scoggin¹, Chao Tan¹, Nam Nguyen¹, Urna Kansakar¹, Shabnam Siddiqui¹, Mark DeCoster¹, and Prabhu Arumugam¹
¹Louisiana Tech University, Ruston, LA

FR-763

Design and Development of Ultrathin Microelectrode Arrays

Joshua Usoro¹, Felix Deku¹, Joseph Pancrazio¹, and Stuart Cogan¹
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FR-764

Softening Shape Memory Polymer Intracortical Probes for Chronic Neural Recordings

Allison Stiller¹, Christopher Frewin¹, Joshua Usoro¹, Vindhya Danda¹, Melanie Ecker¹, Romil Modi², Walter Voit¹, and Joseph Pancrazio¹
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FR-765

Contributions of the Innate Immune Response and Probe Material Properties to Inflammation at the Neural Interface

Hillary Bedell¹, Sydney Song¹, Xujia Li¹, Emily Molinich¹, Shushen Lin¹, Joseph Pancrazio², Walter Voit², and Jeffrey Capadona¹
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FR-766

Simulating Nerve-Tissue Heating Due to an Implantable Neuroprosthetic Device

Daniel Kitts¹ and Erin Patrick¹
¹University of Florida, Gainesville, FL

FR-767

Photoelectric Effect-Induced Intracortical Neural Stimulation with Free-Floating Carbon Fiber Wireless Axon Electrodes

Kaylene Stocking¹, Alberto Vazquez¹, and Takashi Kozai¹
¹University of Pittsburgh, Pittsburgh, PA

FR-768

Development of a Classification Algorithm For Bicep Flexion From Multi-Subject EEG Data

Joshua Myszewski¹, Thomas Reina¹, Eric Bergendahl¹, and Mohammad Rahman¹
¹University of Wisconsin Milwaukee, Milwaukee, WI

FR-769

SMART Glasses for Visual Field Defects: Integration Of Open Source Technology to Create a Practical Solution for Visually Impaired Patients

Abdullah Umar¹, David Reynier², and Arshad Majid³
¹City High Middle School, Grand Rapids, MI, ²Enigma Robotics, Grand Rapids, MI, ³University of Sheffield, Sheffield, United Kingdom

FR-770

Transcutaneous Direct Current (tDC) Nerve Block of the Nociceptive Flexion Reflex in Rats

Tina Vrabec¹, Leah Roldan¹, Kevin Kilgore^{1,2,3}, and Niloy Bhadra²
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FR-771

Flexible Regenerative Nanoelectronics for Advanced Peripheral Neural Interfaces

Austin Veith¹, Xue Li¹, Jason Lee¹, Lan Luan¹, Miguel Armenta-Ochoa¹, Chong Xie¹, and Aaron Baker¹
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FR-772

Chronic Electrochemical Evaluation of Shape-Memory Polymer Nerve Cuff Electrodes

Kaitlynn P Olczak¹, Elliott Dirr¹, Francisco Delgado¹, Amanda Crider¹, Bonnie McLaurin¹, Damon G Lamb^{1,2}, Andrew P Maurer¹, Sara N Burke¹, Barry Setlow¹, Jennifer L Bizon¹, and Kevin J Otto¹
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FR-773

Thin-Film Shape Memory Cuff Electrodes Evoke Reduced Fibrotic Response on Peripheral Nerves

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Track: Neural Engineering

Neural Disease: Model Systems and Therapeutics

FR-774

Spheroid Neural Model for External Electric Stimulation Evaluation

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FR-775

Non-Invasive Sensory Stimulation Targets Deep Brain Structures in Awake Mice

Abigail Paulson¹, Stephanie Prince², Matthew Attokaren³, Lu Zhang³, and Annabelle Singer¹

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FR-776

Hydrogel Constructs for 3D Cell Culture Models of Brain Injury

Yong Lee¹, Hyung Cho², Scott Verbridge¹, and Rafael Davalos¹

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FR-777

CA1 Neural Activity During Spatial Navigation in the 5XFAD Mouse Model of Alzheimer's Disease

Stephanie M Prince¹, Abigail L Paulson^{1,2}, Lu Zhang², Matthew K Attokaren², Solange Amigues², John H Tipton², and Annabelle C Singer^{1,2}

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FR-778

Ocular Hypertension and Age Effects on Retinal Structure in an Animal Model of Menopause

Jieming Fu¹, Rachael S. Allen^{1,2}, Ian C. Campbell^{1,2}, Amy Ottensmeyer³, Victoria Yang¹, C.R. Ethier², Mabelle T. Pardue^{1,2}, and Andrew J. Feola^{1,2}

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FR-779

In-Vitro Assessments of Effect of Brain Injuries and Different Neuronal Network Topologies on Development of Epilepsy

Shabnam Ghiasvand¹ and Yevgeny Berdichevsky¹

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FR-780

Low-dose L-DOPA Treatment Is Protective for Retinal Neuronal And Vascular Function

Kyle Chesler¹, Cara Motz², Jieming Fu¹, Rachael Allen^{1,2}, and Mabelle Pardue^{1,2,3}

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FR-781

A Comparison Of Retinal And Cerebral Deficits In Two Models Of Type II Diabetes: The Goto-Kakizaki Rat And The High Fat Diet + Low Dose STZ Rat

Rachael Allen^{1,2}, Cody Worthy^{1,2}, Andrew Feola^{1,2}, Kyle Chesler^{1,2}, Cara Motz¹, Monica Coulter¹, Peter Thule^{1,3}, Jeffrey Boatright^{1,3}, Timothy Kern⁴, and Mabelle Pardue^{1,2}

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FR-782

Transport of Amyloid- β Across the Blood Brain Barrier by P-glycoprotein: A Novel Therapeutic Target in Alzheimer's Disease

Hope Holt¹, Elizabeth Moore¹, Madeline Riese¹, Michelle Faucett¹, Francisco Gonzalez¹, and Melissa Moss¹

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FR-783

Dynamic Meta-Analysis Approach to In Silico Models of Temporal Multi-scalar Neurophysiology

Albert Lee¹, Stefano Travaglini¹, and Cassie Mitchell²

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Track: Neural Engineering, Stem Cell Engineering

Neural Progenitor and Neural Stem Cell Engineering

FR-784

Establishing High-Throughput Ion Channel Assays in 3D NSC Culture to Identify Ion Channel Inhibitors and Their Downstream Effect on NSC Differentiation

Pranav Joshi¹, Rushabh Patel¹, Soo-Yeon Kang¹, Kyeong-Nam Yu¹, and Moo-Yeal Lee¹

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FR-785

Derivation of Adult Neural Crest Stem Cells from Human Epidermal Keratinocytes

Samaneh Moghadasi Boroujeni¹, Georgios Tseropoulos¹, Surya Selvam¹, Pedro Lei¹, and Stelios Andreadis¹

¹University at Buffalo, Buffalo, NY

FR-786

Piezoelectricity Causes Neural-Like Changes in Mesenchymal Cells

Rabab Chalaby¹, Niasia Williams¹, Kimberly Cook-Chennault¹, and Ronke Olabisi¹

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FR-787

Longitudinally Oriented Core-sheath Nanoyarns Promote Myelinating Schwann Cell Differentiation of MSC for Peripheral Nerve Regeneration

Shaohua Wu¹, Mitchell Kuss¹, Wenhai Zhang¹, Dianjun Qi¹, Hanjun Wang¹, and Bin Duan¹

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FR-788

The Artemin-receptor GFR α 3 is Expressed in Adult Mouse Enteric Glia and Stimulates Neurogenesis

Victoria S. Marks¹, Carina G.S. Melo¹, and David R. Linden¹

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FR-789

Optimization of V2a Interneuron Differentiation from Human Pluripotent Stem Cells via DOE Methods

Eszter Mihaly¹, Jessica C. Butts^{1,2}, Dylan A. McCreedy¹, and Todd C. McDevitt^{1,3}
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Track: Neural Engineering

Neuromodulation: Brain and Spinal Cord

FR-790

Time Evolution of ECoG Network Connectivity in Patients with Refractory Epilepsy

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FR-791

Cutaneous Stimulation to Increase Biceps Responses to Transcranial Magnetic Stimulation

Paul Howell¹, Thibault Roumengous¹, and Carrie Peterson¹
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FR-792

Quantification of Lead Localization Uncertainty in Computational Modeling of Electrocardiography Stimulation and Recording

Chantel Charlebois¹, Kimia Shayestehfard², Daria Nesterovich Anderson¹, Andrew Janson¹, Jeneva Cronin³, Moritz Dannhauer⁴, David Caldwell³, Sumientra Rampersad², Larry Sorensen³, Jeff Ojemann³, Dana Brooks², Rob MacLeod¹, Christopher Butson¹, and Alan Dorval¹
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FR-793

Effect of Intermittent Theta Burst Stimulation Parameters on Biceps Corticomotor Excitability

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FR-794

Manipulating Large-scale Primate Brain Dynamics using Network-based Active Sensing

Shaoyu Qiao¹, Kevin Brown¹, John Sedillo¹, Breonna Ferrentino¹, and Bijan Pesaran¹
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FR-795

Transplantable Axonal Tracts as “Living DBS” for Dopamine Replacement in Parkinson’s Disease

Wisbert J. Gordián-Vélez^{1,2,3}, Laura A. Struzyna^{1,2,3}, Kevin D. Browne^{2,3}, Justin C. Burrell^{1,2,3}, John A. Wolf^{2,3}, John E. Duda³, H. Isaac Chen^{2,3}, and D. Kacy Cullen^{1,2,3}
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FR-796

Spinal MMP-9 Levels & Neuronal Activity Increase Early After a Persistently Painful Nerve Root Injury

Julia Quindlen-Hotek¹, Sonia Kartha¹, Prabesh Ghimire¹, and Beth Winkelstein¹
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FR-797

Modeling Spikes and Other Transients to Improve the Accuracy of Detection of High Frequency Oscillations

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Track: Neural Engineering, Biomechanics

Neuromuscular Biomechanics

FR-798

Nudged by Vision: Sensory Cross-over in Rapid Feedback Pathways that Guide Motor Learning

Hongchul Sohn^{1,2}, Carlos Campos^{1,3,4}, and Eric Perreault^{1,2}
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FR-799

Antigravity Assistive Force Reduces Muscle Activations During Shoulder Elevation Movements

Patrick Hall¹ and Dustin Crouch¹
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Track: Neural Engineering, Biomechanics

Traumatic Brain Injury Biomechanics

FR-800

Focal Hemorrhage Initiated Perivascular Inflammation and Neurodegeneration in Fluid Percussion Animal Model

Xiaotang Ma¹, Yiming Cheng¹, and James Haorah¹
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FR-801

An In Vivo Weight Drop Model to Investigate the Secondary Effects of Multiple Traumatic Brain Injuries

Celeste Dunn¹, Nasya Sturdivant¹, Sara Venier¹, Houston Lamb¹, Hector Rosas-Hernandez², Syed Ali², Jeffrey Wolchok¹, and Kartik Balachandran¹
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FR-802

A Feature-Based Approach to Quantifying Motor Activity in Critically Ill Neurological Patients Using an Unobtrusive Wearable Sensor Matrix

Shubhayu Bhattacharyay¹, John Rattray¹, Aditya Joshi², Sanya Yadav², Tobias Fauser², Shikha Gandhi³, Ralph Etienne-Cummings¹, Pawel Kudela⁴, and Robert Stevens⁴
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FR-803

Therapeutic Function of Glucagon-like Peptide-1 (GLP-1) for Hearing Restoration after Blast Exposure

Rong Gan¹, Tao Chen¹, Kyle Smith¹, and Shangyuan Jiang¹
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FR-804

The Effect of Rotational Deceleration on Brain Response

Kewei Bian¹ and Haojie Mao¹
¹Western University, London, ON, Canada

FR-805

Evaluating Electromagnetic Controlled Cortical Impact Device by Finite Element Analysis

Lihong Lu¹ and Haojie Mao¹
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Track: Neural Engineering, Biomechanics

Stroke and Neurovascular Disease and Models

FR-806

Novel Method for Emboli Analog Formation Towards Improved Stroke Retrieval Devices

Anne Preut¹, Megan Laughlin¹, Hanna Jensen¹, Jamie Hestekin¹, and Morten Jensen¹
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FR-807

Reconstituting Tripartite Synapse on a Chip for Studying Glial-Neuron Interactions in Alzheimer's Disease

Jiwon Yom¹, Song Ih Ahn¹, Hyun-Ji Park¹, and YongTae Kim¹
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FR-808

Effect of Botulinum Toxin on Voluntary EMG-Force Relation in Stroke Survivors Using a Grid of Surface EMG Electrodes

Babak Afsharipour¹, Vladislav Mukhin², Sourav Chandra¹, William Z. Rymer¹, and Nina L. Suresh¹
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FR-809

Characterization of the Effects of Botulinum Neurotoxin on Stretch Reflex Evoked Potentials in a Stroke Survivor

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Track: Neural Engineering

Neural Engineering-Other/Non-specified

FR-810

Transcranial Direct Current Stimulation Transiently Increases the Blood-Brain Barrier Solute Permeability via Nitric Oxide Synthase

Da Wi Shin¹, Jie Fan¹, Niranjan Khadka¹, Eric Luu¹, Wasem Khalid¹, Yifan Xia¹, Marom Bikson¹, and Bingmei Fu¹
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FR-811

Laminar Analysis of Spontaneous and Sensory-evoked Activity in the Primary Sensory Cortex

Pai-Feng Yang¹, Qing Liu¹, John C. Gore¹, and Li Min Chen¹
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FR-812

Serotype Evaluation of an Optogenetic Construct Targeting Rat Cortical Astrocytes

Lakshmi Balachandar¹, Diana Borrego¹, and Jorge Riera Diaz¹
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FR-813

Characterizing the Effects of BPA on Neurodevelopment via Novel Neurotoxicity Screening

Johnathan Morris¹, Elizabeth Bealer¹, Conor Kelly¹, Morgan Dean¹, and Mary Staehle¹
¹Rowan University, Glassboro, NJ

FR-814

Non-stationary Correlation of Calcium Dynamics in 3D PCL Scaffold: Application of Wavelet Transform Coherence

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FR-815

EEG Beamformer for Multiple Correlated Brain Sources Localization

A N M Shahebul Hasan¹ and Kwong T. Ng¹
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FR-816

Effect of Delayed Implantation of Macro-sieve Electrodes In Peripheral Nerve Following Spinal Cord Injury

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FR-817

Effects of Phase Randomization, Tempo and Cognition of Songs in Cardiac Synchronous EEGs

Mohammad Javad Mollakazemi¹, Dibyajyoti Biswal¹, Joyce Evans¹, and Abhijit Patwardhan¹
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FR-818

Clash of Minds: A BCI Car Racing Game in Simulated Virtual Reality Environment

Soheil Borhani¹, Jinxiao Yu¹, James Cate¹, Justin Kilmarx¹, Reza Abiri², and Xiaopeng Zhao¹
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FR-819

Convolutional Neural Networks for a Cursor Control Brain Computer Interface

David Saffo¹, Justin Kilmarx², Soheil Borhani², Reza Abiri³, Xiaopeng Zhao², and Mark Albert¹
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FR-820

Frequency Analysis of EMG Signals of Individuals with Spinal Cord Injury: Comparison Between FFT, STFT and Wavelet Methods

Samineh Mesbah¹, Federica Gonnelli², Enrico Rejc¹, Susan Harkema¹, and Ayman El-baz¹
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Track: Bioinformatics, Computational and Systems Biology

Novel Methods for Systems Biology

FR-821

Develop a Universal FRET Technology Platform for Quantitative Systems Biology

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FR-822

A Framework for Translation of Genomic Responses from Mouse Models to Human Inflammatory Disease Contexts

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FR-823

Role of Capillary Endothelial Cell Inwardly Rectifying Potassium Channel in Neurovascular Coupling: A Theoretical Study

Arash Moshkforoush¹, Asad Mirza¹, and Nikolaos Tsoukias¹
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FR-824

Mechanisms of Negative BOLD Responses

Pedro Valdes-Hernandez¹, Arash Moshkforoush¹, and Jorge Riera¹
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FR-825

Systematic Analysis of the Topic Landscape of Aging and Alzheimer's Disease Literature

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FR-826

Biocuration: Improving Automation, Productivity, Accuracy and Quality Control

Joseph Murphy¹, Kathleen Jordan¹, Andrew Sedler¹, Keelie Denson¹, and Cassie Mitchell²
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FR-827

Can We Quantify Futility? Implementation of Resilience Engineering in Clinical Decision Making: Principles and Directions

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FR-828

Synthetic Ecosystem Constructed with a Biofabricated Membrane to Intercept Inter-Kingdom Interactions

Sayed Rooholghodos¹, John Choy¹, and Xiaolong Luo¹
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FR-829

Multi-fidelity Analysis for Predicting Rare Events in Complex Biological Systems

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FR-830

Metabolic Mechanisms of Interaction Within a Defined Gut Microbiota

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FR-831

Medusa: A Software Package for Construction and Analysis of Ensembles of Metabolic Networks

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Track: Bioinformatics, Computational and Systems Biology

Omics Data: Methods, Modeling and Analysis

FR-832

Discordant Predictions Generated by Metabolic Models Constrained with Transcriptomics or Proteomics

Maureen Carey¹, Ana Untaroiu¹, and Jason Papin¹
¹University of Virginia, Charlottesville, VA

FR-833

Updates and Performance Evaluation of the ClusPro Web Server for Protein-protein DockingIsrael Desta¹, Kathryn Porter², Bing Xia², and Sandor Vajda²
¹Boston University, Allston, MA, ²Boston University, Boston, MA

FR-834

Machine Learning Based Discovery of Urinary Biomarkers of SepsisSabyasachi Bandyopadhyay¹, Nicholas Lysak¹, Lasith Adhikari¹, Tezcan Baslanti¹, Larysa Sautina¹, Maria Lopez², Mark Segal¹, Henry Baker¹, Azra Bihorac¹, and Parisa Rashidi¹
¹University of Florida, Gainesville, FL

FR-835

Model-based Comparisons of the Dynamics of Microbial Metapopulations in Two LakesPhuongan Dam¹, Luis Rodriguez-R¹, Chengwei Luo¹, Janet Hatt¹, Despina Tsementzi¹, Konstantinos Konstantinidis¹, and Eberhard Voit¹
¹Georgia Institute of Technology, Atlanta, GA

FR-836

Gastrointestinal Symptom Trends in Children with Autism Spectrum Disorder: A Retrospective AnalysisTroy Vargason^{1,2}, Deborah L. McGuinness¹, and Juergen Hahn¹
¹Rensselaer Polytechnic Institute, Troy, NY, ²OptumLabs Visiting Fellow, Troy, NY

FR-837

Automated Annotation of Glycoproteomics Mass Spectrometry Spectra Enabled by the Integration of DrawGlycan with GlycoPATKai Cheng¹ and Sriram Neelamegham¹
¹University at Buffalo, State University of New York, Buffalo, NY

FR-838

Inference of Cross-Tissue Compartment Cytokine Signatures in Pulmonary FibrosisKaty Norman¹, Carol Wilke¹, Bethany Moore¹, and Kelly Arnold¹
¹University of Michigan, Ann Arbor, MI

FR-839

Genomic Analysis of Autism Spectrum Disorders Based on Different Brain Imaging ModalitiesMohammed Elmogy¹, Andrew Switala¹, Eric Rouchka¹, Mohammed Ghazal², Robert Keynton¹, Ayman El-Baz¹, and Gregory Barnes³
¹University of Louisville, Louisville, KY, ²Abu Dhabi University, Abu Dhabi, United Arab Emirates, ³University of Louisville Autism Center, Louisville, KY

FR-840

Biomarker Discovery for the Detection of Rupture-Prone Abdominal Aortic AneurysmsJacob Kennard^{1,2}, Alina Ismaguilova¹, Deborah Studer¹, Richard Beddoes¹, Arianna Forneris¹, Elena S. Di Martino^{1,3,4,5,6}, Randy D. Moore⁷, Kristina D. Rinker^{1,4,6,8,9}, and Robert D. Shepherd¹⁰
¹University of Calgary, Calgary, AB, Canada, ²Cellular and Molecular Bioengineering Research Lab, Calgary, AB, Canada, ³Schulich School of Engineering, Calgary, AB, Canada, ⁴Centre for BioEngineering Research and Education, Calgary, AB, Canada, ⁵Zymetrix Biomaterials & Tissue Engineering Technology Development Centre, Calgary, AB, Canada, ⁶Libin Cardiovascular Institute of Alberta, Calgary, AB, Canada, ⁷Calgary Health Region, Calgary, AB, Canada, ⁸Cellular and Molecular Bioengineering Research Lab, CALGARY, AB, Canada, ⁹Schulich School of Engineering, Calgary, AB, Canada, ¹⁰Syantra Diagnostics Inc., Calgary, AB, Canada

FR-841

Augmentation of Electrocardiographic QRS R-amplitude Precedes Radiocontrast-induced Hypotension during Mobile Computed Tomography ScanningJae-Man Kim¹, Hye-Mee Kwon¹, and Sung-Hoon Kim¹
¹Asan Medical Center, Seoul, Korea, Republic of

FR-842

Sex Differences in Healthy Human Heart Revealed by Cap Analysis Gene Expression (CAGE)Anna Gams¹, Ndeye Rokhaya Faye¹, Ruslan Deviatiiarov², Aaron C. Koppel¹, and Igor R. Efimov¹
¹The George Washington University, Washington, DC, ²Kazan Federal University, Kazan, Russian Federation

FR-843

Feature Selection Method for Metabolomic Data Using Principal Component Analysis and K-means ClusteringJonathan Garcia¹, Sarah Basehore¹, and Alyssa Morss clyne¹
¹Drexel University, Philadelphia, PA**Track: Bioinformatics, Computational and Systems Biology****Bioinformatics, Computational and Systems Biology—Other/Non-specified**

FR-845

Decision Tree-based Classification for Differentiating System Lupus Erythematosus and Mixed Connective Tissue DiseaseKyle See¹, Simeng Zhu¹, and Ruogu Fang¹
¹University of Florida, Gainesville, FL

FR-846

Per-residue Energetic Analysis Clarifies the Mechanism of the Binding Strength inside MicrotubulesNing Liu¹, Ramana Pidaparti¹, and Xianqiao Wang¹
¹University of Georgia, Athens, GA

FR-847

Mathematical Modeling and Estimating Parameters for T1DM RatsRamin Balouchzadeh¹, Guney Uzun¹, Hoo Sang Ko¹, H. Felix Lee¹, Sarah Park², Hong Gyu Han³, and Guim Kwon¹
¹Southern Illinois University Edwardsville, Edwardsville, IL, ²Duke University, Durham, NC, ³Independent Consultant, Cary, NC

FR-848

AMPK and Estrogen-dependent Mechanisms Underlying Hypersensitivity to CVD During MenopauseMarissa Pier¹, Danielle Cannon¹, and John Konhilas¹
¹University of Arizona, Tucson, AZ

Friday, October 19 | 9:30 am–5:00 pm | GWCC Exhibit Hall

Poster Viewing with Authors & Refreshment Break | 9:30 am–10:15 am and 2:45 pm–3:30 pm

FR-849

In Vivo Longitudinal Tracking of the DAF-16 Transcription Factor in *C. elegans*

Javier Huayta¹, Mohammad Nourmohammadzadeh¹, and Adriana San Miguel¹
¹North Carolina State University, Raleigh, NC

FR-850

waveCSD: A Method for Estimating Transmembrane Currents Originated from Propagating Neuronal Activity in the Neocortex: Application to Study Cortical Spreading Depression

Arash Moshkforoush¹, Pedro A Valdes-Hernandez¹, Daniel E. Rivera¹, Yoichiro Mori², and Jorge Riera Diaz¹
¹Florida International University, Miami, FL, ²University of Minnesota, Minneapolis, MN

FR-851

How Does Ascorbate Improve Endothelial Dysfunction?—A Computational Analysis

Sheetal Joshi¹ and Mahendra Kavdia¹
¹Wayne State University, Detroit, MI

FR-852

Stage-based Spatiotemporal Modeling of Loggerhead Turtle Population Dynamics

Aravind Sundararajan¹, Daniel Nalepa¹, Matthew Wilson¹, and Xiaopeng Zhao¹
¹University of Tennessee, Knoxville, TN

FR-853

A Dataset Generation Library for MIMIC Medical Informatics

Ty Vaughan¹, Xiaopeng Zhao¹, and Michael Berry¹
¹University of Tennessee, Knoxville, TN

FR-854

Computer Model to Study the Effect Of Elevated Temperatures on Compound Action Potentials

Eric Yeats¹, Mohit Ganguly², Jeremy Ford², and Duco Jansen²
¹Vanderbilt University, Nashville, TN, ²Department of Biomedical Engineering, Vanderbilt University, Nashville, TN

FR-855

Computational Modeling of Valve Behavior in Hydrocephalus Shunts

Daphne Schlesinger¹, Ryan Najmi¹, Vinay Ayyappan¹, Dante Navarro¹, Walter Zhao¹, Helen Wiegand¹, Shayan Hemmati¹, Anneka Kleine¹, Collyn Heier¹, Mark Luciano¹, and Amir Manbachi¹
¹Johns Hopkins University, Baltimore, MD

FR-856

Interpretable Deep Learning for Breast Cancer Pathology Image Classification

Ying Sha¹, Li Tong², Johnny Chen², and May Wang²
¹Georgia Institute of Technology, Atlanta, GA, ²Georgia Institute of Technology and Emory University, Atlanta, GA

FR-857

Development of an Expert Surgeon Validation Tool for Breast Reconstruction Decision-Making

Krista Nicklaus^{1,2}, Kamil Ali¹, Fatima Merchant³, Summer Hanson², Greg Reece², and Mia Markey^{1,2}
¹The University of Texas at Austin, Austin, TX, ²The University of Texas MD Anderson Cancer Center, Houston, TX, ³University of Houston, Houston, TX

FR-858

Web-based Assessment of Aneurysm Rupture Potential Using a Data-driven Approach

Clint Johnson¹, Sarai Alvarez², Lauren Buchanan¹, Brian Schnoor¹, Abdulaziz Alhammad¹, Airmin Dhisha¹, Felicitas Detmer¹, and Juan Cebral¹
¹George Mason University, Fairfax, VA

Track: Bioinformatics, Computational and Systems Biology**Systems Approaches to Therapy, Therapeutics, and Precision Medicine**

FR-859

Whole-Body Computational Design of Biomimetic Cells that Inhibit Circulating Tumor Cells

Tanishq Abraham¹ and Cheemeng Tan¹
¹University of California, Davis, Davis, CA

FR-860

PathFX Provides Mechanistic Insights into Drug Efficacy and Safety for Regulatory Review and Therapeutic Development

Jennifer Wilson¹, Rebecca Raczy², Tianyun Liu¹, Oluseyi Adeniyi², Jielin Sun², Anuradha Ramamoorthy², Michael Pacanowski², and Russ Altman¹
¹Stanford University, Stanford, CA, ²US Food and Drug Administration, Silver Spring, MD

FR-861

Microenvironment-dependent Models of the Proteolytic Network and Inhibition of Protease Activity

Chris Kieslich¹, Meghan Ferrall-Fairbanks¹, W. Andrew Shockey¹, and Manu Platt¹
¹Georgia Institute of Technology, Atlanta, GA

FR-862

RNA Sequencing of Focused Ultrasound-Treated Melanoma Reveals That Thermal Ablation and Hyperthermia Elicit Differential Immunogenicity

Alexander Mathew¹, Andrew Thim¹, Timothy Bullock¹, and Richard Price¹
¹University of Virginia, Charlottesville, VA

FR-863

Hybrid Agent-Based Model to Predict Drug Delivery to Heterogeneous Tumors Overexpressing HER2

Bruna Menezes¹, Cornelius Cilliers¹, Greg Thurber¹, and Jennifer Linderman¹
¹University of Michigan, Ann Arbor, MI

FR-864

Predicting the Risk of Aortic Dissection: A Proposal for a Resilience Engineering Approach

Hisham Sherif¹
¹University of Delaware Christiana Care, Newark, DE

FR-865

Dissecting FcyR Regulation Through a Multivalent Binding Model

Ryan Robinett¹, Ning Guan¹, Anja Lux², Markus Biburger², Falk Nimmerjahn², and Aaron Meyer³
¹Massachusetts Institute of Technology, Cambridge, MA,
²Friedrich-Alexander-University of Erlangen-Nürnberg, Erlangen, Germany,
³University of California, Los Angeles, Los Angeles, CA

FR-866

Oncogene mRNA Knockdown Using Small Molecule Drugs

Jonathan Mitchell¹, Minati Satpathy¹, Jeffrey Skolnick¹, and John McDonald¹
¹Georgia Institute of Technology, Atlanta, GA

FR-867

Phenotypic Kinetic Metrics to Characterize Cancer Cell Drug Response

Natacha Comandante Lou¹, Divya Venkat¹, and Mohammad Fallahi-Sichani¹
¹University of Michigan, Ann Arbor, MI

Track: Bioinformatics, Computational and Systems Biology

Systems Biology of Infectious Disease

FR-868

Pharmacodynamics and Immune Cell Interactions during Immunomodulatory Treatment of HIV: A Mechanistic Modelling Approach

Jonathan Cody¹, Amy Ellis-Connell², Shelby O'Connor², and Elsje Pienaar¹
¹Purdue University, Weldon School of Biomedical Engineering, West Lafayette, IN,
²University of Wisconsin-Madison, Department of Pathology and Laboratory Medicine, Madison, WI

FR-869

Modeling Host-Parasite Interactions in Malaria Blood-Stage Infections in Rhesus Macaques

Luis Fonseca¹, Chester Joyner², Celia Saney², Alberto Moreno², John Barnwell³, Mary Galinski², and Eberhard Voit¹
¹Georgia Institute of Technology, Atlanta, GA,
²Emory University, Atlanta, GA,
³Centers for Disease Control and Prevention, Atlanta, GA

FR-870

Harnessing Systems Biology to Develop Predictive Models of Metabolic Behavior in Antimicrobial Resistant Bacterial Pathogens

Sean Mack¹, Daniel Yarmovsky¹, and Daniel Dwyer¹
¹University of Maryland, College Park, College Park, MD

Track: Drug Delivery & Intelligent Systems

Novel Materials and Self Assembly

FR-871

Controlled and Targeted Delivery of Doxorubicin Loaded Nucleic Acid Nanocarriers from Novel, Self-Assembled PLGA-PEG-PLGA Nanogels Utilizing Multiple Non-Covalent Interactions to Treat Posterior Capsule Opacification

Laura Osorno¹, Robert Getts², Mindy George-Weinstein³, and Mark Byrne¹
¹Rowan University, Glassboro, NJ,
²Genisphere, LLC, Hatfield, PA,
³Philadelphia College of Osteopathic Medicine, Philadelphia, PA

FR-872

Self-Assembling Core Crosslinked Nanoparticles

Rebecca Ulrich von Bargen¹ and Handan Acar^{1,2}
¹University of Oklahoma, Norman, OK,
²University of Chicago, Chicago, IL

Track: Drug Delivery & Intelligent Systems

Nucleic Acid Delivery

FR-873

Vesicular Transport of Electrotransfected DNA in Cells

Liangli Wang¹, Sara Miller², and Fan Yuan¹
¹Duke University, Durham, NC,
²Duke University Medical School, Durham, NC

FR-874

Targeted Delivery of microRNA-145 by Platelet-mimicking Nanoparticles Ameliorates Intima Hyperplasia

Kuei-Chun Wang¹, Diana Dehaini¹, Liangfang Zhang¹, and Shu Chien¹
¹University of California, San Diego, La Jolla, CA

FR-875

Screening of Clinically Approved Drugs for Small Molecules that Prime Nonviral Gene Delivery to Human Mesenchymal Stem Cells

Tyler Kozisek¹, Alec McCarthy¹, Andrew Hamann¹, Albert Nguyen¹, and Angela K. Pannier¹
¹University of Nebraska-Lincoln, Lincoln, NE

FR-876

Focused Ultrasound-Mediated Transfection of Cerebral Vasculature Independent of Blood-Brain Barrier Opening

Catherine Gorick¹, Ji Song¹, Alexander Klibanov¹, and Richard Price¹
¹University of Virginia, Charlottesville, VA

FR-877

Biophysical Process of Ultrasound and Microbubble Mediated Intracellular Plasmid DNA Uptake

Ning Rong¹, Hao Zhou², Ruming Liu², Yan Wang¹, and Zhenzhen Fan^{1,3}
¹Tianjin University, Tianjin, China, People's Republic of,
²Nankai University, Tianjin, China, People's Republic of,
³Institute of Acoustics, Chinese Academy of Sciences, Beijing, China, People's Republic of

Track: Drug Delivery & Intelligent Systems

Delivery Systems for Proteins and Vaccines

FR-878

Characterization of Microneedle Materials, Insertion Forces, and Failure

Elaine Sung¹ and Burak Ozdoganlar²
¹Carnegie Mellon University, Monroeville, PA,
²Carnegie Mellon University, Pittsburgh, PA

FR-879

Modified Chitosan-Zein Nano-in-Microparticles For Oral DNA Vaccination

Eric Farris¹, Matthew Boren¹, Austin Helmink¹, Anna Lampe¹, Amanda Ramer-Tait¹, Deborah Brown¹, and Angela Pannier¹
¹University of Nebraska-Lincoln, Lincoln, NE

FR-880

Targeted Intracellular Delivery of Macromolecules using High Frequency Ultrasound

Sangpil Yoon^{1,2}, Pengzhi Wang³, Qin Peng³, Yingxiao Wang³, and Kirk Shung²
¹University of Notre Dame, Notre Dame, IN, ²University of Southern California, Los Angeles, CA, ³University of California, San Diego, San Diego, CA

FR-881

Rapid-Dissolve Griffithsin Fibers for Multipurpose Protection

Kevin Tyo¹ and Jill M. Steinbach-Rankins²
¹University of Louisville, Louisville, KY, ²University of Louisville, Louisville, KY

FR-882

Optimizing a Comprehensive Vaccine Design for Commensal Disease Progression

Roozbeh Nayerhoda¹, Charles Jones², Marie Beitelshees¹, Andrew Hill², and Blaine Pfeifer¹
¹University at Buffalo, The State University of New York, Buffalo, NY, ²Abcombi Biosciences Inc., Buffalo, NY

FR-883

Microparticles for the Magnetically Triggered Release of Placental-derived Biomacromolecules

Olivia Lanier¹, Adam Monsalve¹, Isaac Adjei¹, Dayita Wable¹, Omani Tuitt¹, Peter McFetridge¹, and Jon Dobson¹
¹University of Florida, Gainesville, FL

FR-884

Development and Characterization of Nanoparticles Containing V domain of sRAGE for Enhancing Diabetic Wounds Healing

Hwan June Kang¹, Suneel Kumar¹, Biraja Dash², Henry Hsia², Martin Yarmush¹, and Francois Berthiaume¹
¹Rutgers University, Piscataway, NJ, ²Yale University, New Haven, CT

FR-885

The Structure-Activity Relationship Study of Synthetic Combinatorial Lipidoids Library for In Vivo CRISPR/Cas9 Delivery

Yamin Li¹ and Qiaobing Xu¹
¹Tufts University, Medford, MA

Track: Drug Delivery & Intelligent Systems

Targeted or Responsive Delivery Systems

FR-886

Multiple Exposure Drug Release from Stable Nanodroplets by High-Intensity Focused Ultrasound for a Potential Degenerative Disc Disease Treatment

Khoi Nguyen¹, Hsuan-Yeh Pan², Kevin Haworth², Eric Mahoney², Karla Mercado-Shekhara², Chia-Ying Lin², Zhe Zhang², and Yoonjee Park²
¹University of Cincinnati, Cin, OH, ²University of Cincinnati, Cincinnati, OH

FR-887

Enhancement of Antibacterial Activity With Silver-Furosemide Loaded Chitosan Nanoparticles.

Victor Rodriguez¹, Rahul Kalhapure¹, Pradeep Bolla¹, Stefani Perez¹, Julain Franco¹, Carlos Meraz¹, and Jwala Renukuntla¹
¹University of Texas, El Paso, El Paso, TX

FR-888

Development of 3D Microfluidic Chip for Drug Screening and Drug Resistance Analysis in Brain Tumor Microenvironments

Hyunho Kim¹, Hye Won Lee², and Seok Chung¹
¹Korea University, Seoul, Korea, Republic of, ²Sungkyunkwan University, Suwon, Korea, Republic of

FR-889

Photoresponsive Nanoshells Coated with siRNA for On-Demand Gene Regulation

Rachel Riley¹, Megan Dang¹, Margaret Billingsley¹, Baxter Abraham¹, Lars Gundlach¹, and Emily Day¹
¹University of Delaware, Newark, DE

FR-890

Oxidation-Responsive Nanolayered Coatings for the On-Demand Delivery of Therapeutic Growth Factors

John Martin¹, MayLin Funkenbusch¹, Sheryl Wang¹, and Paula Hammond¹
¹Massachusetts Institute of Technology, Cambridge, MA

FR-891

Pretargeting Mucosal Surfaces to Prolong Retention of Mucus-Penetrating Particles

Justin Huckaby¹, Christina Parker¹, Alison Schaefer¹, Alexander Nguyen¹, Anting Wang¹, and Sam Lai¹
¹University of North Carolina at Chapel Hill, Chapel Hill, NC

FR-892

Role of Valency and Concentration Dose of ICAM-1-Targeted 3DNA Carriers In Vivo

Niksa Roki¹, Jessica Bowers², Robert Getts², and Silvia Muro^{1,3}
¹Fischell Department of Bioengineering, University of Maryland, College Park, MD, ²Genisphere LLC, Hatfield, PA, ³Institute for Bioscience and Biotechnology Research, University of Maryland, College Park, MD

FR-893

A Scalable 3D-Printed Fully Implantable Microsystem for Murine Inner Ear Drug Delivery With Wireless Control

Farzad Forouzandeh¹, Ahmed Alfadhel¹, Xiaoxia Zhu², Joseph Walton², Denis Cormier¹, Robert Frisina², and David Borkholder¹
¹Rochester Institute of Technology, Rochester, NY, ²University of South Florida, Tampa, FL

FR-894

Suprachoroidal Space Injection for Highly Targeted Ocular Drug Delivery by Iontophoresis and Hyaluronic Acid Hydrogel Pushing

Jaehwan Jung¹, J. Jeremy Chae¹, and Mark Prausnitz¹
¹Georgia Institute of Technology, Atlanta, GA

FR-895

Phagocytic Cell Mediated Drug Delivery & Release Via Magnetic Field Induced Vomocytosis Using Magnetic Nano-Liposomal Vesicles

Serkan Yaman^{1,2}, Harish Ramachandramoorthy^{1,2}, Manoj Kumar Sabnani¹, Jon A. Weidanz¹, and Kytai T. Nguyen^{1,2}
¹The University of Texas at Arlington, Arlington, TX, ²University of Texas Southwestern Medical Center, Dallas, TX

FR-896

Therapeutic Effect of siRNA Delivery via Antibody-Targeted Nanoparticles to Sites of Early Onset Post-Traumatic Osteoarthritis

Sean Bedingfield¹, Danielle Liu¹, Fang Yu¹, Hongsik Cho², Meredith Jackson¹, Karen Hasty², and Craig Duvall¹
¹Vanderbilt University, Nashville, TN, ²University of Tennessee, Memphis, TN

FR-897

Nanoparticle Targeting to the Endothelium During Normothermic Machine Perfusion of Human Kidney

Gregory Tietjen¹, Sarah Hosgood², Jenna DiRito¹, Jiajia Cui¹, Deeksha Deep¹, Eric Song¹, Jan Kraehling¹, Alexandra Piotrowski-Daspi¹, Nancy Kirkiles-Smith¹, Rafia Al-Lamki², Sathia Thiru², J. Andrew Bradley², Kourosh Saeb-Parsy², John Bradley², Michael Nicholson², W. Mark Saltzman¹, and Jordan Pober¹
¹Yale University, New Haven, CT, ²University of Cambridge, Cambridge, United Kingdom

FR-898

Inhibition of NF-κB Signaling Leads to Altered Pain-related Behavior in the Monoiodoacetate Mouse Model of Osteoarthritis

Ian Berke¹, Thomas McGrath¹, Era Jain¹, Elizabeth Leimer¹, Yousef Abu-Amer², Gabriel Mbalaviele², and Lori Setton¹
¹Washington University in St. Louis, Saint Louis, MO, ²Washington University School of Medicine, St. Louis, MO

FR-899

Ultrasound-mediated Drug Release for the Treatment of Peripheral Artery Disease

Duong Le¹, Tam Nguyen¹, Joseph Wolf¹, Aneetta Kuriakose¹, Wenbin Cai¹, Yang Liu¹, Suchismita Acharya², Kytai Nguyen¹, and Baohong Yuan¹
¹University of Texas at Arlington, Arlington, TX, ²UNT Health Science Center, Fort Worth, TX

FR-900

Shear-Targeted Anti-Thrombotic Drug Delivery Using DNA-Origami Nano-Carriers

Oren Rotman¹, Matan Yah Ben-Zion², Shmuel Einav¹, Nadrian Seeman², and Danny Bluestein¹
¹Stony Brook University, Stony Brook, NY, ²New York University, New York, NY

FR-901

Significant Cure Rate for Mice with Malaria Using a Novel Fusion Protein

Patrick McKernan¹ and Roger Harrison¹
¹University of Oklahoma, Norman, OK

FR-902

Ultrasound Mediated Polymer Based Drug Delivery

Aarushi Bhargava¹, Kaiyuan Peng¹, Reza Mirzaeifar¹, and Shima Shahab¹
¹Virginia Polytechnic Institute and State University, Blacksburg, VA

FR-903

Acoustic Microbubble Clusters: Novel Ultrasound Sensitive particles for On-demand Drug Release *In Vivo*

Ronald Hall¹ and Shashank Sirsi¹
¹University of Texas Dallas, Richardson, TX

FR-904

Decorating Extracellular Matrix with Azide Motifs to act as a Refillable Drug Depot

Mary Regan¹ and Yevgeny Brudno¹
¹North Carolina State University and University of North Carolina, Raleigh, NC

FR-905

H2O2-Activatable Contrast-Enhanced Photoacoustic Imaging and Antithrombotic Therapy

Dongwon Lee¹
¹Chonbuk National University, Jeonju, Korea, Republic of

FR-906

H2O2-triggered CO2 Bubble Generating Polymeric Nanoparticles for Ultrasound Imaging and Therapy

Eunkyeong Jung¹, Lipjeong Jeong¹, Hyejin Hyeon¹, and Dongwon Lee¹
¹Chonbuk National University, Jeonju, Korea, Republic of

Track: Bioinformatics, Computational and Systems Biology

Theory and Practice of Synthetic Biology

FR-907

Engineering a Kinase Toolkit for the Production of Recombinant, Tyrosine Phosphorylated Proteins

Amjad Nasir¹, Katherine Schaberg¹, Roman Sloutsky¹, an Kristen Naegle¹
¹Washington University, St. Louis, MO

Track: Drug Delivery & Intelligent Systems

Drug Delivery & Intelligent Systems- Other/Non-specified

FR-908

An Albumin Binding GLP-1 Chimera Provides Blood Glucose Control for Seven Days in Diabetic db/db Mice

Parisa Yousefpour¹, Rishi Subrahmanyam¹, Kelli Luginbuhl¹, and Ashutosh Chilkoti¹
¹Duke University, Durham, NC

FR-909

Mechanisms of Ultrasound-Enhanced Drug Delivery for Treatment of Onychomycosis

Liam Sweeney¹, Alina Kline-Schoder¹, Vesna Zderic¹, and Zung Le²
¹The George Washington University, Washington, DC, ²GWU Medical Faculty Associates, Washington, DC

FR-910

Innovative 3D Printed Multipurpose Intravaginal Rings

Denali Dahl¹, Rima Januszewicz¹, Kevin Olson¹, Sue Mecham¹, Roopali Shrivastava¹, Gayane Paravyan¹, Alka Prasher¹, Panita Maturavongsadit¹, and S. Rahima Benhabbour¹
¹University of North Carolina, Chapel Hill, Chapel Hill, NC

Track: Drug Delivery & Intelligent Systems, Tissue Engineering

Drug Delivery in Tissue Engineering & Medicine

FR-911

Development of a Topical Curdlan Hydrogel System for Complex Wound Regeneration

Tam Nguyen¹, Adam Bachtel¹, Mustafa Abdalla¹, Nikhil Pandey¹, and Kytai Nguyen¹
¹University of Texas at Arlington, Arlington, TX

FR-912

Sustained Release of VEGF and Ang-1 Peptide Mimetic Sequences from Nanocomposite Matrices Promote In Vivo Neovascularization

Georgia Papavasiliou¹, Daniel Young², Yusheng He², Brianna Roux², Sami Somo², Wenqiang Liu², Jessica Park², Wesley Lo², Merjem Mededovic², Marcella Vaicik², and Eric Brey³
¹Illinois Institute of Technology, CHICAGO, IL, ²Illinois Institute of Technology, Chicago, IL, ³UTSA, San Antonio, TX

FR-913

Sustained-Release Platelet-Rich Plasma from Polyethylene Glycol Hydrogels Exerts Beneficial Effects on Chondrocytes

Alexandra Blanco¹, Era Jain², Nobuaki Chinzei², Natasha Case¹, Scott Sell¹, Muhammad Farooq Rai², and Silviya Zustiak¹
¹Saint Louis University, Saint Louis, MO, ²Washington University in Saint Louis, Saint Louis, MO

FR-914

Delivery of Osteo-protective NSAID Diflunisal from ROS-responsive Microspheres

Hannah Kang¹, Thomas Spoonmore¹, and Scott Guelcher¹
¹Vanderbilt University, Nashville, TN

FR-915

Effect of Nitric Oxide Releasing Nanomatrix Gel on Dental Pulp Stem Cells

Catherine Porter¹, David Cruz Walma¹, Jeremy Mao², Dishant Shah¹, Hui Wu¹, Ho-Wook Jun¹, and Kyounga Cheon¹
¹University of Alabama at Birmingham, Birmingham, AL, ²Columbia University, New York City, NY

FR-916

Localized Release of Steroids from Macroporous Organosilicone Beads Scaffolds

Jiapu Liang¹, Kaiyuan Jiang¹, Robert Accolla¹, and Cherie Stabler¹
¹University of Florida, Gainesville, FL

FR-917

Nanoparticle-mediated Drug Delivery from Macroporous Microribbon Hydrogels for Accelerating Tissue Regeneration

Danial Barati¹, Xinming Tong¹, Menglin Chen², and Fan Yang¹
¹Stanford University, Stanford, CA, ²Aarhus University, Aarhus, Denmark

FR-918

Nitric Oxide Releasing Bionanomatrix Gel for Dialysis Fistula Maturation

Patrick Hwang¹, Maheshika Somarathna², Grant Alexander², Reid Millican¹, Brigitta Brott^{1,2}, Jennifer Pollock², Timmy Lee², and Ho-Wook Jun^{1,2}
¹Endomimetics, LLC, Birmingham, AL, ²University of Alabama at Birmingham, Birmingham, AL

FR-919

Modeling of an Implantable, Bioresorbable Drug Delivery Device

Patrick Giolando¹, Kelsey Hopkins¹, Joseph Rispoli¹, Nicole Vike¹, Tamara Kinzer-Ursem¹, and Luis Solorio¹
¹Purdue University, West Lafayette, IN

FR-920

Microphysiological System for Study of Drug Clearance through Joint Synovium following Intra-Articular Delivery

Young Guang¹, Natalie Klug¹, James Fitzpatrick², Christine Pham², and Lori Setton¹
¹Washington University in St. Louis, St. Louis, MO, ²Washington University School of Medicine, St. Louis, MO

FR-921

Simulating Pharmacokinetics of The Lectin Griffithsin In The Vaginal Lumen and on its Mucosal Surfaces

Alan Sze¹ and David Katz¹
¹Duke University, Durham, NC

Track: Biomedical Engineering Education (BME)

Industry Preparation

FR-922

Evaluation of Professional Development Intervention in Undergraduates in Biomedical Engineering

Sean Bedingfield¹, Jonathan Ehrman¹, Christina Marasco¹, and Kendra Oliver²
¹Vanderbilt University, Nashville, TN, ²Vanderbilt University Medical Center, Nashville, TN

FR-923

Development and Evaluation of a Master's Certificate in Translational Biomedical Research

Casey Ankeny¹, Gloria Kim¹, and Mark Fisher¹
¹Northwestern University, Evanston, IL

Track: Biomedical Engineering Education (BME)

Multi-disciplinary and Inter-disciplinary Curriculum

FR-924

Project Outcomes and Student Perspectives Show Benefits of Diversity in Senior Capstone Design Teams

Mark Ruegsegger¹, Tanya Nocera¹, and Sandra Metzler¹
¹The Ohio State University, Columbus, OH

FR-925

REU: Discoveries in Bioimaging at the University of Illinois at Urbana-Champaign (2015-2017)

Marina Marjanovic¹, Joanne Li¹, Daniel Wong², Andrew Smith¹, and Stephen Boppart¹
¹University of Illinois at Urbana-Champaign, Urbana, IL, ²University of Illinois at Urbana-Champaign, Champaign, IL

FR-926

BioDesign and Innovation in the Undergraduate Classroom

Julie Semon¹ and David Westenberg¹
¹Missouri University of Science and Technology, Rolla, MO

FR-927

Piloting Art and Design Integration in Northeastern University's Young Scholar's Program

Tess Torregrosa¹, Claire Duggan¹, Pedro Miguel Cruz¹, Julia Hechtman¹, Ann McDonald¹, Ibrahim Zeid¹, Abigail Koppes¹, and Ryan Koppes¹
¹Northeastern University, Boston, MA

FR-928

Finite Element Analysis and Computed Aided Design in Biomedical Engineering Curriculum—Evaluation of Design and Delivery

Pun To Yung¹
¹Syracuse University, Syracuse, NY

FR-929

Infusion of Entrepreneurship into a Biomedical Engineering Design Curriculum

Marc Moore¹
¹The University of Oklahoma, Norman, OK

FR-930

Introducing 3D Printing to Prospective Medical Students to Integrate Engineering Concepts into a Multidisciplinary Curriculum

Olivia C. Coiado¹, Kashif Ahmad¹, Jaya G. Yodh¹, and Roberto Galvez¹
¹Carle Illinois College of Medicine, University of Illinois at Urbana-Champaign, Champaign, IL

Track: Biomedical Engineering Education (BME)

Service Learning

FR-931

Biomedical Engineering Study Abroad Course: Prosthetics in Ecuador

Ellen Brennan-Pierce¹ and Debra Misuraca¹
¹Colorado State University, Fort Collins, CO

FR-932

Adapting and Adopting Agile Development from Engineering to Public Health Methodology for Data-Driven Projects

Faisal Reza, MS, PhD¹, Rahul Gupta, MD, MPH, MBA, FACP², Christina R. Mullins, MA², James E. Jeffries, MS², Sarah K. Sanders, PhD², Jamie E. Mells, PhD³, Jina J. Dcruz, MSW, PhD¹, and Mark L. Messonnier, MS, PhD¹
¹Public Health Informatics Fellowship Program, Division of Scientific Education and Professional Development, Centers for Disease Control and Prevention, Atlanta, GA, ²Bureau for Public Health, West Virginia Department of Health and Human Resources, Charleston, WV, ³Division of Analysis, Research, and Practice Integration, National Center for Injury Prevention and Control, Centers for Disease Control and Prevention, Atlanta, GA

FR-933

The Akron Learning Community Program

Mariam Crow¹, Sharon Truesdell¹, and Marnie Saunders¹
¹The University of Akron, Akron, OH

Track: Biomedical Engineering Education (BME)

Biomedical Engineering Education (BME)—Other/Non-specified

FR-934

Emphasizing Models and Their Use in a First-Year Biomedical Engineering Course

Anathea Pepper¹
¹Virginia Commonwealth University, Richmond, VA

FR-935

Introducing High School Students to Cancer Research

Paloma Pearson¹, Marcia Pool¹, and Nicole Jackson¹
¹University of Illinois at Urbana-Champaign, Urbana, IL

FR-936

Analyzing Concept Networks of Student Learning in an Engineering Mathematics Course

Jessica Rose¹, Danielle Bassett¹, and LeAnn Dourte Segan¹
¹University of Pennsylvania, Philadelphia, PA

FR-937

Gender Disparities in the Biomedical Engineering Program at University of Los Andes

Diana Gaitan-Leon¹, Pilar Navas-Navas¹, and Juan M. Cordovez¹
¹University of Los Andes, Bogota, Colombia

FR-938

Laboratory Exercise to Measure Restriction Enzyme Kinetics

Caroline Blassick¹, Paul Jensen¹, and Karin Jensen¹
¹University of Illinois at Urbana-Champaign, Urbana, IL

FR-939

Understanding the Role of International Research Experiences on Developing Integrative and Collaborative Practices in Science

Daniel Tavakol¹ and Garrett Beeghly²
¹Ecole Polytechnique Federale de Lausanne, Lausanne, Switzerland, ²University of Cambridge, Cambridge, United Kingdom

SATURDAY'S SCHEDULE HIGHLIGHTS

PLATFORM SESSIONS-SAT-1

8:00 am–9:30 am Convention Center
18 Concurrent Sessions See pages 180–189

SPECIAL SESSIONS

8:00 am–9:30 am A310
Application of Two-Dimensional Materials in Healthcare

8:00 am–9:30 am Room A311
Scientific Advancement in the Biomechanics of Prosthetic Heart Valves

8:00 am–9:30 am Room A301
BMES-NSF Session on Graduate Research Fellowships Program
(pre-registration required)

8:00 am–9:30 am Room A304
ABioM SIG Meeting

Exhibit Hall & Posters Open

9:30 am–1:30 pm Exhibit Hall

Poster Viewing with Authors

9:30 am–10:30 am Exhibit Hall

PLENARY SESSION

10:30 am–11:45 am Sidney Marcus Auditorium

**Rita Schaffer Young Investigator Lecture
Mid-Career Award Lecture | Design Competition Awards | Poster Awards**

Emily Day, PhD
University of Delaware



Cynthia Reinhart-King, PhD
Vanderbilt University



PLATFORM SESSIONS-FRI-2

1:30 pm–3:00 pm Convention Center
19 Concurrent Sessions See pages 190–198

SPECIAL SESSION

1:30 pm–3:00 pm Room A310
International Collaboration in Biomedical Engineering Education

PLATFORM SESSIONS-FRI-3

3:15 pm–4:45 pm Convention Center
18 Concurrent Sessions See pages 199–205

OP-Sat-1-1

Sidney Marcus Auditorium

Track: Biomechanics

Brain Injury Biomechanics

Chairs: Joel Stitzel, Beth Winkelstein

8:00 am–8:15 am

Comparison of Head Impact Exposure Between Concussed and Non-Concussed Football Athletes

Brian Stemper^{1,2}, Alok Shah³, Steven Rowson⁴, Stefan Duma⁴, Jason Mihalik⁵, Jaroslaw Harezlak⁶, Larry Riggen⁶, Steve Broglio⁷, Thomas McAllister⁶, and Michael McCrea³
¹Marquette University & Medical College of Wisconsin, Milwaukee, WI, ²Zablocki Veterans Affairs Medical Center, Milwaukee, WI, ³Medical College of Wisconsin, Milwaukee, WI, ⁴Virginia Tech, Blacksburg, VA, ⁵University of North Carolina, Chapel Hill, NC, ⁶Indiana University, Indianapolis, IN, ⁷University of Michigan, Ann Arbor, MI

8:15 am–8:30 am

Developing a Novel Mouse Brain Biomechanical Model with 3-D Vasculature

Lihong Lu¹, John Sled², and Haojie Mao¹
¹Western University, London, ON, Canada, ²University of Toronto, Toronto, ON, Canada

8:30 am–8:45 am

The Relationship Between Strain-Based Cumulative Exposure and Changes in White Matter Integrity Among High School Football Players

Logan Miller¹, Jillian Urban¹, Elizabeth Davenport², Alexander Powers¹, Christopher Whitlow¹, Joseph Maldjian², and Joel Stitzel¹
¹Wake Forest University School of Medicine, Winston-Salem, NC, ²University of Texas Southwestern Medical Center, Dallas, TX

8:45 am–9:00 am

Effects of Skull, Brain and Neck Stiffness on the Spatial and Temporal Deformation of Brain Under Blunt and Blast Trauma

Abdus Ali¹, Michael Hanna¹, Karan Modi¹, Prasad Bhatambarekar¹, Christopher Morris¹, Namas Chandra¹, Michael Kleinberger², and Bryan Pfister¹
¹New Jersey Institute of Technology, Newark, NJ, ²U.S. Army Research Laboratory, Aberdeen, MD

9:00 am–9:15 am

Analysis of Brain Tissue Simulants for Physical Models of Traumatic Brain Injury

Alexander Singh¹, Ahmed Alshareef¹, and Matthew Panzer¹
¹University of Virginia, Charlottesville, VA

9:15 am–9:30 am

Development of Tissue Injury Metrics for Predicting Traumatic Brain Injury Following Rapid Head Rotation

Marzieh Hajiaghamemar¹, Taotao Wu², Matthew Panzer², and Susan Margulies^{1,3}
¹Georgia Institute of Technology, Atlanta, GA, ²University of Virginia, Charlottesville, VA, ³Emory University, Atlanta, GA

OP-Sat-1-2

Room A312

Track: Biomaterials

Biomaterials for Immunoengineering I

Chairs: Ankur Singh, Michael Mitchell

8:00 am–8:15 am

Mucosal Nanoparticle Vaccine Induces Protective Tissue-Resident T Cell Memory in Lungs

Frances C. Knight¹, Pavlo Gilchuk², amrendra Kumar², Kyle W. Becker¹, Sema Sevimli¹, Max Jacobson¹, Kelli L. Boyd², Sebastian Joyce², and John T. Wilson¹

¹Vanderbilt University, Nashville, TN, ²Vanderbilt University Medical Center, Nashville, TN

8:15 am–8:30 am

Cardiovascular Immunotherapy via Surface Engineered Anti-inflammatory Nanocarriers

Sijia Yi¹, Xiaohan Zhang¹, Hussain Sangji¹, Yugang Liu¹, Baixue Xiao¹, Sharan Bobbala¹, and Evan Scott¹

¹Northwestern University, Evanston, IL

8:30 am–8:45 am

Single-cell Encapsulation of MSCs: Increased *In Vivo* Survival and Therapeutic Potential in BMT

Angelo Mao¹, Jae-won Shin², David Weitz¹, and David Mooney¹

¹Harvard University, Cambridge, MA, ²University of Illinois at Chicago, Chicago, IL

8:45 am–9:00 am

Lymph Node Delivery of Tolerogenic Depots Prevents and Reverses Disease in a Model of Relapsing-Remitting Multiple Sclerosis

Emily Gosselin¹ and Christopher Jewell^{1,2,3,4,5,6}

¹Fischell Department of Bioengineering, University of Maryland–College Park, College Park, MD, ²Robert E. Fischell Institute for Biomedical Devices, College Park, MD, ³United States Department of Veterans Affairs, Baltimore, MD, ⁴Molecular and Cellular Biology, Biological Sciences Training Program, University of Maryland–College Park, College Park, MD, ⁵Department of Microbiology and Immunology, University of Maryland School of Medicine, Baltimore, MD, ⁶Marlene and Stewart Greenebaum Cancer Center, Baltimore, MD

9:00 am–9:15 am

A Dual-Sized Microparticle Approach Halts Autoimmunity in an Animal Model of Multiple Sclerosis

Josh Stewart¹, Jon Cho¹, Alex Kwiatkowski¹, Theodore Drashansky¹, Eric Helm¹, Ashley Zuniga¹, Dorina Avram¹, and Benjamin Keselowsky¹

¹University of Florida, Gainesville, FL

9:15 am–9:30 am

Versatile Assembly of Oxidation-responsive Polymeric Bicontinuous Nanospheres via Flash Nanoprecipitation: *In Vitro* and *In Vivo* Evaluation

Sharan Bobbala¹, Sean Allen¹, Nicholas Karabin¹, and Evan Scott¹

¹Northwestern University, Evanston, IL

OP-Sat-1-3

Room A410

Track: Cancer Technologies

Physical and Biochemical Pathways in Cancer

Chairs: Todd Sulchek, Madeleine Oudin

8:00 am–8:15 am

Dynamic Stiffening Promotes Malignant Transformation in Conjunction with Paracrine Signaling

Matthew Ondeck¹, Aditya Kumar¹, Jesse Placone¹, Bibiana Matte^{1,2}, Kirsten Wong¹, Christopher Plunkett¹, Daehwan Kim¹, Laurent Fattet¹, Jing Yang¹, and Adam Engler^{1,3}

¹University of California San Diego, La Jolla, CA, ²Federal University of Rio Grande do Sul, Porto Alegre, Brazil, ³Sanford Consortium for Regenerative Medicine, La Jolla, CA

8:15 am–8:30 am

Investigating How Dynamic Mechanical Strain in the Lung Tumor Microenvironment Influences Drug Resistance

YouJin Cho¹, Chris Bobba¹, Vasudha Shukla², Joshua Englert², Arunark Kolipaka^{1,2}, and Samir Ghadiali^{1,2}

¹The Ohio State University, Columbus, OH, ²The Ohio State University Wexner Medical Center, Columbus, OH

8:30 am–9:00 am

Microfluidics to Identify Drug Resistance Pathways Through Biophysical Cell Sorting

Todd Sulchek¹, Muhymn Islam¹, and Edmund Waller²

¹Georgia Tech, Atlanta, GA, ²Emory, Atlanta, GA



9:00 am–9:30 am

Nuclear Deformability and Expression of Lamin A/C as Predictors of Metastatic Potential in Breast Cancer Cells

Emily Bell^{1,2}, Pragya Shah², Alexandra McGregor², Philipp Isermann², DS Kim², Marcus Smolka², Paul Span³, and Jan Lammerding²

¹Penn State University, University Park, PA, ²Cornell University, Ithaca, NY, ³Radboud University Medical Center, Nijmegen, Netherlands



OP-Sat-1-4

Room A313

Track: Tissue Engineering, Orthopedic and Rehabilitation Engineering

Musculoskeletal Tissue Engineering IV

Chairs: Lesley Chow, Blanka Sharma

8:00 am–8:15 am

Effect of Dysfunctional Skeletal Muscle Satellite Cells on Angiogenesis

Francisca Acosta¹, Matthew Burgess¹, and Christopher Rathbone¹

¹The University of Texas at San Antonio, San Antonio, TX

8:15 am–8:30 am

Structure-Function Relationships in Human Nasal Cartilage

Wendy Brown¹, Laura Lavernia¹, Jerry Hu¹, Brian Wong², and Kyriacos Athanasiou¹

¹University of California Irvine, Irvine, CA, ²University of California Irvine, Orange, CA

8:30 am–8:45 am

3D Walking Kinetics in Response to Surgically- Reduced Adipose in a Transfemoral Amputee Residuum

Emily Levy¹, Nicholas Fey¹, and Keith Gordon²
¹The University of Texas at Dallas, Richardson, TX,
²Northwestern University, Chicago, IL

8:45 am–9:00 am

An Ex Vivo Pregnant-like Tissue Model to Assess Injectable Hydrogel for Preventing Preterm Birth

Nicole Raia¹, Stephanie Bakaysa², Chiara Ghezzi¹, Michael House², and David Kaplan¹
¹Tufts University, Medford, MA, ²Tufts Medical Center, Boston, MA

9:00 am–9:15 am

Novel Human Cartilage-Bone-Synovium Microphysiological System for Post-Traumatic Osteoarthritis

Garima Dwivedi¹, Lisa Flaman¹, Emily Geishecker¹, Vicki Rosen², Susanna Chubinskya³, Begum Alaybeyoglu¹, Nathan Thomas⁴, Brad Luyster⁴, Jordan Fite⁴, Ken Barton⁴, Chris Scherzer⁴, Eugene Boland⁴, Murat Cirit¹, and Alan Grodzinsky¹
¹Massachusetts Institute of Technology, Cambridge, MA, ²Harvard School of Dental Medicine, Boston, MA, ³Rush University, Chicago, IL, ⁴Techshot Inc, Greenville, IN

OP-Sat-1-5

Room A314

Track: Biomechanics

Biofluid Mechanics

Chairs: Yunfei Shi, Bahareh Behkam

8:00 am–8:15 am

Unexpectedly Similar Umbilical Vascular Wall Shear Stress Environment Between Normal and Intrauterine Growth Restriction Pregnancies

Shier Nee Saw¹, Yu Wei Poh¹, Dawn Chia², Citra Nurfarah Zaini Mattar², Arijit Biswas², and Choon Hwai Yap¹
¹National University Of Singapore, Singapore, Singapore, ²National University Health System, Singapore, Singapore, Singapore

8:15 am–8:30 am

Improving Efficacy Of Cerebral Aneurysm Treatment Using A Novel Platelet-Based Computational Analysis

Venkat Keshav Chivukula¹, Laurel Marsh¹, Michael Barbour¹, Fanette Chassagne¹, Cory Kelly¹, Louis Kim¹, Michael Levitt¹, and Alberto Aliseda¹
¹University of Washington, Seattle, WA

8:30 am–8:45 am

Sinus Hemodynamics Variation with Tilted Transcatheter Aortic Valve Deployments

Hoda Hatoum¹, Jennifer Dollery¹, Scott Lilly¹, Juan A. Crestanello¹, and Lakshmi Dasi¹
¹The Ohio State University, Columbus, OH

8:45 am–9:00 am

Entrainment of Lymphangions to Oscillatory Shear Stress is Determined by Their Intrinsic Contractility and Shear Sensitivity

Anish Mukherjee¹, Joshua Hooks¹, and J Brandon Dixon¹
¹Georgia Institute of Technology, Atlanta, GA

9:00 am–9:15 am

Resonant Acoustic Tweezing Spectroscopy for Small-Volume Noncontact Assessment of Soft Biological Materials

Nithya Kasireddy¹, Daishen Luo¹, Deepika Rajkumar¹, and Damir Khismatullin¹
¹Tulane University, New Orleans, LA

9:15 am–9:30 am

In vivo measurements of Outflow Facility in Mice with iPerfusion

Joseph Sherwood¹, Michael Madekurozwa¹, and Darryl Overby¹
¹Imperial College London, London, United Kingdom

OP-Sat-1-6

Room A315

Track: Biomedical Imaging and Instrumentation

Fluorescence

Chairs: Javier Jo, Francisco Robles

8:00 am–8:15 am

Autofluorescence Imaging and Heterogeneity Analysis of T cells



Alex Walsh¹, Katie Mueller^{1,2}, Isabel Jones¹, Tiffany M. Heaster¹, Steve Trier¹, Krishanu Saha¹, and Melissa C. Skala¹
¹University of Wisconsin-Madison, Madison, WI, ²Wisconsin Institute for Discovery, Madison, WI

8:15 am–8:30 am

In Vivo, Label-Free Multiphoton Microscopy Quantifies Age-Related Differences in Skin Wound Metabolism

Jake Jones¹, Hallie Ramser¹, Alan Woessner¹, and Kyle Quinn¹
¹University of Arkansas, Fayetteville, AR

8:30 am–8:45 am

In Vivo Ultrasound-switchable Fluorescence Imaging

Tingfeng Yao¹, Shuai Yu¹, Yang Liu¹, and Baohong Yuan¹
¹The University of Texas at Arlington, Arlington, TX

8:45 am–9:00 am

Visualizing Ischemic Skin Flap Necrosis Through Phasor Analysis of Autofluorescence Lifetime Images

Hallie Ramser¹, Alan Woessner¹, S. Morteza Seyed Jafari², Fabian Blank², Maziar Shafiqhi², Helmut Beltraminelli², Ralph A. Schmid², Thomas Geiser², Robert Hunger², amiq Gazdhar², and Kyle Quinn¹
¹University of Arkansas, Fayetteville, AR, ²Bern University Hospital, Bern, Switzerland

9:00 am–9:15 am

A CRISPR/Molecular Beacon Hybrid System for Live-Cell Imaging of Single Genomic Loci

Xiaotian Wu¹, Shiqi Mao¹, Muaz Rushdi^{1,2}, Christopher Krueger^{1,2}, and Antony Chen¹
¹Peking University, Beijing, China, People's Republic of, ²Georgia Institute of Technology, Atlanta, GA

9:15 am–9:30 am

Characterizing Metabolic Changes in Leigh's Syndrome Using Label-Free Multiphoton Microscopy

Olivia Kolenc¹, Ajibola Bakare¹, Isaac Vargas Lopez¹, Joshua Stabach¹, Shilpa Iyer¹, and Kyle Quinn¹
¹University of Arkansas, Fayetteville, AR

OP-Sat-1-7

Room A316

Track: Biomedical Imaging and Instrumentation, Neural Engineering

Imaging in Neuroscience

Chairs: Jorge Riera Diaz, Weizhao Zhao

8:00 am–8:15 am

High-speed Photoacoustic Microscopy with a Ultrawide Scanning Range

Junjie Yao¹, Bangxin Lan¹, and Wei Liu¹
¹Duke University, Durham, NC



8:15 am–8:30 am

A Personalized Early-Detection of Autism Spectrum Disorder using DTI and sMRI

Yaser Elnakieb¹, Omar Dekhil¹, Ahmed Shalaby¹, Babajide Ainde¹, Ali Mahmoud¹, Andy Switala¹, Adel Elmaghraby¹, Robert Keynton¹, Mohamed Ghazal¹, Gregory Barnes¹, and Ayman El-Baz¹
¹University of Louisville, Louisville, KY

8:30 am–8:45 am

Intracranial Electrical Impedance for Monitoring of Severe Traumatic Brain Injury

Alicia Everitt¹, Brandon Root², David Bauer², and Ryan Halter¹
¹Dartmouth College, Hanover, NH, ²Dartmouth Hitchcock Medical Center, Lebanon, NH

8:45 am–9:00 am

DTI Tractography of the Nigrostriatal Pathway in Parkinson's Disease

Jason Langley¹, Daniel Huddleston², and Xiaoping Hu¹
¹University of California, Riverside, Riverside, CA, ²Emory University, Atlanta, GA

9:00 am–9:15 am

Repetitive Non-concussive Head Impact Exposure Alters Brain Connectivity of Youth Football Players

Donghoon Kim^{1,2}, Jeongchul Kim², Caitlin Carroll², Mireille Kelley^{1,2}, Jillian Urban^{1,2}, Megan Johnston², Elizabeth Davenport³, Youngkyoo Jung^{1,2}, Alexander Powers², Joel Stitzel^{1,2}, Joseph Maldjian³, and Christopher Whitlow^{1,2}
¹Virginia Tech–Wake Forest University School of Biomedical Engineering and Sciences, Winston Salem, NC, ²Wake Forest School of Medicine, Winston Salem, NC, ³University of Texas Southwestern Medical Center, Dallas, TX

9:15 am–9:30 am

Cognitive Training Modulates White Matter Properties in TBI

Kihwan Han¹, David Martinez¹, Sandra Chapman¹, and Daniel Krawczyk^{1,2}
¹University of Texas at Dallas, Dallas, TX, ²University of Texas Southwestern Medical Center, Dallas, TX

OP-Sat-1-8

Room A302

Track: Tissue Engineering, Biomechanics

Biomechanics in Cell and Tissue Engineering

Chairs: Rosalyn Abbott, Jun Lian

8:00 am–8:15 am

A Mathematical Model for the Post-Implant Collagen Maturation Behavior of Pulmonary Artery Engineered Tissue Conduits

Michael Sacks¹
¹University of Texas at Austin, Austin, TX

8:15 am–8:30 am

The Effects of Compressive Loading on *In Vitro* Prevascularized Tissue Engineering Constructs

Marissa Ruehle^{1,2}, Laxminarayanan Krishnan¹, Ryan Akman^{1,2}, Steven LaBelle³, Nick Willett^{1,2}, Jeffrey Weiss³, and Robert Guldberg¹
¹Georgia Institute of Technology, Atlanta, GA, ²Emory University, Atlanta, GA, ³University of Utah, Salt Lake City, UT

8:30 am–8:45 am

Porous Pouch To Minimize Peritoneal Adhesion for an *In Vivo* Bioreactor-Based Vascular Graft Strategy

Mahyar Sameti¹, Kranthi Vuppuluri¹, Mozghan Shojaee¹, Matthew Ziff¹, Alessandra Carriero², and Chris Bashur¹
¹Florida Institute of Technology, Melbourne, FL, ²City College of New York, New York, NY

8:45 am–9:00 am

Multi-Layered Scaffolds Containing IGF-1 Improves Myogenesis

Chiara Rinoldi¹, Azadeh Mostafavi², Afsoon Fallahi³, Iman K. Yazdi⁴, Indranil Sinha⁵, Wojciech Swieszkowski¹, and Ali Tamayol²
¹Warsaw University of Technology, Warszawa, Poland, ²University of Nebraska-Lincoln, Lincoln, NE, ³Wyss Institute, Boston, MA, ⁴Harvard Institutes of Medicine, Boston, MA, ⁵Brigham and Women's Hospital, Boston, MA

9:00 am–9:15 am

How Lymphatic Endothelial Conductivity Depends on Transendothelial Flow Conditions and Substrate Stiffness

Emily Margolis¹, Cassandra Chua¹, and Joe Tien¹
¹Boston University, Boston, MA

9:15 am–9:30 am

A PLLA Scaffold with a Biomimetic Continuous Gradient Pore Size that Differentially Induces Local Chondrogenesis and Osteogenesis for Osteochondral Repair

Riccardo Gottardi^{1,2}, Gioacchino Conoscenti³, Peter Alexander¹, Vincenzo La Carrubba³, Valerio Brucato³, and Rocky Tuan¹
¹University of Pittsburgh, Pittsburgh, PA, ²Ri.MED Foundation, Palermo, Italy, ³Università degli Studi di Palermo, Palermo, Italy

OP-Sat-1-9

Room A305

Track: Device Technologies and Biomedical Robotics

Point of Care: Enabling Technology and Applications

Chairs: Dino Dicarolo, Chenzhong Li

8:00 am–8:15 am

SNP Genotyping Analysis on a Laboratory-Free Sample-to-Answer Magnetofluidic Platform

Fan-En Chen¹, Dong Jin Shin¹, and Tza-Huei Wang¹
¹Johns Hopkins University, Baltimore, MD

8:15 am–8:30 am

Exosomal Protein MicroRNA OneStop Biosensor: a New Liquid Biopsy Device for Cancer Screening and Early Detection

Yunchen Yang¹, Xie Zeng¹, Qiaoqiang Gan¹, and Yun Wu¹
¹University at Buffalo, The State University of New York, Buffalo, NY

8:30 am–8:45 am

Nanoplasmonic Swarm Biosensing Towards Point of Care Applications

Mengxing Ouyang¹ and Dino Di Carlo¹
¹University of California, Los Angeles, Los Angeles, CA

8:45 am–9:00 am

Rapid, Label-free, and Ultra-Sensitive Detection of Urine hCG Using Frequency-locked On-chip Optical Microcavities

Erol Ozgur¹, Kara Roberts¹, Ekin Ozgur¹, Adley Gin¹, Jaden Bankhead¹, and Judith Su¹
¹University of Arizona, Tucson, AZ

9:00 am–9:15 am

ClotChip: A Microfluidic Dielectric Sensor for Whole Blood Based Rapid Assessment of Coagulopathy and Hemostatic Dysfunction at the Point-of-Care

Anirban Sen Gupta¹, Debnath Maji¹, Maria de la Fuente¹, Erdem Kucukal¹, Ujjal Sekhon¹, Alvin Schmaier², Umut Gurkun¹, Marvin Nieman¹, Evi Stavrou³, Pedram Mohseni¹, and Michael Suster¹
¹Case Western Reserve University, Cleveland, OH,
²University Hospitals of Cleveland, Cleveland, OH,
³Louis Stokes Veterans Administration Medical Center, Cleveland, OH

9:15 am–9:30 am

Nanocalorimeter Based Point of Care Thermometric ELISA with Femtomole Sensitivities

Evan Kazura¹, Ray Mernaugh², and Franz Baudenbacher¹
¹Vanderbilt University, Nashville, TN, ²Vanderbilt University School of Medicine, Nashville, TN

OP-Sat-1-10

Room A401

Track: Cardiovascular Engineering, Biomechanics

Cardiovascular Mechanobiology

Chairs: Renita Horten, Ashley Brown

8:00 am–8:15 am

Matrix Stiffness Regulates Vascular Integrity Through Focal Adhesion Kinase Activity

Wenjun Wang¹, Emmanuel Lollis², Francois Bordeleau¹, and Cynthia Reinhart-King^{1,2}
¹Vanderbilt University, Nashville, TN, ²Cornell University, Ithaca, NY

8:15 am–8:30 am

Toward Maturation of hu-iPSC Cardiomyocytes Using Mechanically Dynamic Magnetorheological Elastomers

Elise Corbin¹, Alexia Vite¹, Eliot Peyster¹, Myan Bhoopalam¹, and Kenneth Margulies¹
¹University of Pennsylvania, Philadelphia, PA

8:30 am–8:45 am

Towards Uncovering N-Cadherin Force Dependent Protein-Protein Interactions

Ishaan Puranam¹ and Brenton Hoffman¹
¹Duke University, Durham, NC

8:45 am–9:00 am

Peptide-Modified Hyaluronic Acid Microstructural Cues for Mechanosensitive Regulation of Fibrosis and Enhanced Vascularization of the Myocardium During Heart Failure.

Priya Mohindra¹, Long Le¹, Qizhi Fang¹, Rich Sievers¹, Randall Lee¹, and Tejal Desai¹
¹University of California, San Francisco, San Francisco, CA

9:00 am–9:15 am

Turbulent Flow Enhances Non-Coding Genomic Regulation of Endothelial Cells Functional Deficits

Jesse Placone¹, Evan Teng¹, Pranjali Beri¹, and Adam Engler^{1,2}
¹University of California San Diego, La Jolla, CA, ²Sanford Consortium for Regenerative Medicine, La Jolla, CA

9:15 am–9:30 am

Heterogeneities in Vascular Stiffness Disrupt Endothelial Monolayer Integrity

Jacob Vanderburgh^{1,2}, Halie Hotchkiss¹, Archit Potharazu², and Cynthia Reinhart-King^{1,2}
¹Cornell University, Ithaca, NY, ²Vanderbilt University, Nashville, TN

OP-Sat-1-11

Room A403

Track: Cardiovascular Engineering

**Valvular and Vascular
Computational Modeling**

Chairs: Stephanie George, Loraine Lowder

8:00 am–8:15 am

**Numerical Biomechanical Model of
Transcatheter Aortic Valve Deployment in
Stenotic Bicuspid Aortic Valve and its Effect on
Paravalvular Leakage**

Karin Lavon¹, Gil Marom¹, Matteo Bianchi², Rotem Halevi¹, Ashraf Hamdan³, Ehud Raanani⁴, Danny Bluestein², and Rami Haj-Ali^{1,2}
¹Tel Aviv University, Tel Aviv, Israel, ²Stony Brook University, Stony Brook, NY, ³Rabin Medical Center, Petach Tikva, Israel, ⁴Chaim Sheba Medical Center, Tel Hashomer, Israel

8:15 am–8:30 am

**Patient-Specific Modeling After Drug-Eluting
Stent Implantation Reveals Indices of Wall Shear
Stress That Predict Sites of Restenosis and
Malapposition in the Coronary Arteries**

Jesse Gerringer¹, Ali Aleiou¹, Hiromasa Otake², Amirhossein Arzani³, and John LaDisa¹
¹Marquette University and Medical College of Wisconsin, Milwaukee, WI, ²Kobe University, Kobe, Japan, ³Northern Arizona University, Flagstaff, AR

8:30 am–8:45 am

**Development and Validation of a High-
Resolution Tricuspid Valve Simulation Platform**

Shelly Singh-Gryzbon¹, Vahid Sadri¹, Milan Toma², Zhenglun Alan Wei¹, Eric Pierce¹, and Ajit Yoganathan¹
¹Georgia Institute of Technology, Atlanta, GA, ²New York Institute of Technology, New York, NY

8:45 am–9:00 am

**Computational Investigations of Coronary Artery
Growth During Embryonic Heart Development**

Suhaas Anbazhakan¹, Kristy Red-Horse¹, and Alison Marsden¹
¹Stanford University, Stanford, CA

9:00 am–9:15 am

**Fluid-Structure Interaction Analysis of Mitral
Valve Repair with Transapical Neo-Chordae
Implantation**

Andres Caballero¹, Wenbin Mao¹, and Wei Sun¹
¹Georgia Tech, Atlanta, GA

9:15 am–9:30 am

**Investigation of an Injection Jet Shunt for the
Fontan Surgery Using a Tightly-Coupled Multi-
scale Computational Fluid Dynamics Model**

Kyle Beggs¹, Marcus Ni², Ray Prather¹, Eduardo Divo², Alain Kassab¹, and William DeCampi³
¹University of Central Florida, Orlando, FL, ²Embry-Riddle Aeronautical University, Daytona, FL, ³Arnold Palmer Hospital for Children, Orlando, FL

OP-Sat-1-12

Room A404

Track: Cellular and Molecular
Bioengineering, Biomechanics

**Cellular and Molecular
Biomechanics: Mechanobiology**

Chairs: Daniel Conway, Venkat Maruthamuthu

8:00 am–8:15 am

**Lamin Mutations Cause Mechanically-induced
Nuclear Envelope Rupture and DNA Damage in
Muscle Fibers**

Ashley Earle¹, Gregory Fedorchak¹, Tyler Kirby¹, Philipp Isermann¹, Jineet Patel¹, Sushruta Iruvanti¹, and Jan Lammerding¹
¹Cornell University, Ithaca, NY

8:15 am–8:30 am

**Hemodynamic Shear Stress Regulates Assembly
of the Notch Mechanosensory Complex to
Modulate Vascular Barrier Function**

William Polacheck^{1,2,3}, Matthew Kutys^{2,3}, Jinling Yang³, Jeroen Eyckmans³, and Christopher Chen^{2,3}
¹University of North Carolina at Chapel Hill, Chapel Hill, NC, ²Harvard University, Cambridge, MA, ³Boston University, Boston, MA

8:30 am–8:45 am

**Cyclic Mechanical Strain Induces an Inflammatory
Phenotype in Antigen Presenting Cells**

Michael Raddatz¹, Cynthia Clark¹, and W. David Merryman¹
¹Vanderbilt University, Nashville, TN

8:45 am–9:00 am

**Mechanotransduction Via High Affinity LFA-1
Promotes Assembly of Kindlin-3/RACK1/Orai1, A
Complex That Signals Intracellular Calcium Flux**

Vasilios Morikis¹, Myung Hyun Jo², Taekjip Ha², and Scott Simon¹
¹University of California, Davis, Davis, CA, ²Johns Hopkins University, Baltimore, MD

9:00 am–9:15 am

**Tunable Molecular Tension Sensors Reveal
Extension-Based Control of Vinculin Loading**

Andrew LaCroix¹, Andrew Lynch¹, and Brenton Hoffman¹
¹Duke University, Durham, NC

9:15 am–9:30 am

**Intranuclear Tensile Strains Mediate Chromatin
Reorganization During Cardiac Maturation**

Benjamin Seelbinder¹, Soham Ghosh¹, Sarah Calve², and Corey Neu¹
¹University Of Colorado Boulder, Boulder, CO, ²Purdue University, West Lafayette, IN

OP-Sat-1-13

Room A405

Track: Nano and Micro Technologies,
Tissue Engineering

Organ-on-Chip for Regenerative Medicine I

Chairs: Jason Gleghorn, Jungwoo Lee

8:00 am–8:15 am

Fab-free Rapid Prototyping of a Thermoplastic Patient Derived Intestine-on-a-Chip

Sanjin Husic¹, Fanny Zhou², Will Lake¹, Marissa Puzan¹, David Breault^{2,3,4}, Ryan Koppes¹, Shashi Murthy¹, and Abigail Koppes¹
¹Northeastern University, Boston, MA, ²Boston Children's Hospital, Boston, MA, ³Harvard Medical School, Boston, MA, ⁴Harvard Stem Cell Institute, Boston, MA

8:15 am–8:30 am

Enabling Immune Cell And Drug Perfusion in a Skin-On-A-Chip to Model Virus Infection and Antiviral Therapeutics

Sijie Sun^{1,2} and Jia Zhu^{1,2}
¹University of Washington, Seattle, WA, ²Fred Hutchinson Cancer Research Center, Seattle, WA

8:30 am–8:45 am

Microengineered Human Blood-Brain Barrier with 3D Glial Network for Neuroinflammation Modeling in Alzheimer's Disease

Song Ih Ahn¹, Jiwon Yom¹, Hyun-Ji Park¹, and YongTae Kim¹
¹Georgia Institute of Technology, Atlanta, GA

8:45 am–9:00 am

Development Of A Human iPSC-based Cardiac Microphysiological System With Multimodal Tissue Interrogation

Nicholas Jeffreys¹, Verena Charwat¹, Nathaniel Huebsch², Bérénice Charrez¹, Regina Sakoda¹, Nikhil Deveshwar¹, Brian Siemons¹, Steven Boggess¹, Evan Miller¹, Bruce Conklin^{3,4}, and Kevin Healy¹
¹University of California, Berkeley, Berkeley, CA, ²Washington University in St. Louis, St. Louis, MO, ³Gladstone Institute of Cardiovascular Disease, San Francisco, CA, ⁴University of California, San Francisco, San Francisco, CA

9:00 am–9:15 am

Fibrotic Microtissue Array to Provide Novel Platform for Anti-Fibrosis Drug Validation

Mohammadnabi Asmani¹, Isaac Hsia¹, Sanjana Velumani¹, Yan Li¹, Zhaowei Chen¹, Nicole Wawrzyniak¹, Boris Hinz², and Ruogang Zhao¹
¹University at Buffalo, State University of New York, Amherst, NY, ²University of Toronto, Toronto, ON, Canada

9:15 am–9:30 am

DVT-on-Chip: Microphysiological Model of Venous Thrombosis Including Valves, Endothelium & Blood Flow

Navaneeth Pandian¹, Pranav Gadangi¹, and Abhishek Jain¹
¹Texas A&M University, College Station, TX

OP-Sat-1-14

Room A406

Track: Translational Biomedical Engineering, Device Technologies and Biomedical Robotics

Interventional Devices and Micro/Nano Tools

Chairs: Nicole Rylander

8:00 am–8:15 am

Optimizing Bi-PAP Intervention for ALS using Predictive Medicine

Nishad Khamankar¹, Leila Bond¹, Paulamy Ganguly¹, Nolan Mallet¹, and Cassie Mitchell²
¹Georgia Institute of Technology, Atlanta, GA, ²Georgia Institute of Technology & Emory University, Atlanta, GA

8:15 am–8:30 am

Platelet Contraction Cytometry as a Clinical Nanomechanical Biomarker and Comparative Medicine Platform

Oluwamayokun Oshinowo¹, Traci Leong², Benjamin Brainard³, Carolyn Bennett⁴, Wilbur Lam¹, and David Myers¹
¹The Georgia Institute of Technology and Emory University, Atlanta, GA, ²Emory University, Atlanta, GA, ³University of Georgia, Athens, GA, ⁴Emory University School of Medicine, Atlanta, GA

8:30 am–8:45 am

Noninvasive Prediction of Response to Immunosuppressive Therapy in Organ Transplantation

Quoc Mac¹, David Mathews², Justin Kahla¹, Claire Stoffers¹, Olivia Delmas¹, Brandon Holt¹, Andrew Adams², and Gabriel Kwong¹
¹Georgia Institute of Technology, Atlanta, GA, ²Emory University, Atlanta, GA

8:45 am–9:00 am

A Novel Non-Contact Electric Field Therapy Enhances Angiogenesis and Wound Healing in Porcine Model

Nava P. Rijal¹, Emma Stumpf¹, Kathryn Cornuelle¹, Alyssa Wolfinger¹, Daniel Perry¹, Vasuretha Chandar¹, Andrei Kogan², and Daria Narmoneva¹
¹University of Cincinnati, Department of Biomedical Engineering, Cincinnati, OH, ²University of Cincinnati, Department of Physics, Cincinnati, OH

9:00 am–9:15 am

Restoring Flux Capacity of Deadend Filtration Membranes Via Pulse Width Modulated Periodic Backflush

Aaron Enten¹, Matthew Leipner¹, and Todd Sulchek¹
¹Georgia Institute of Technology, Atlanta, GA

OP-Sat-1-15

Room A407

Track: Drug Delivery & Intelligent Systems

Nanoparticles for Drug Delivery and Genetic Engineering

Chairs: Eduardo Silva, Harvinder Gill

8:00 am–8:30 am

Intrathecal Nanoparticle Drug Delivery: New Opportunities for Treating Disease in the Brain and Spinal Cord

Rachael Sirianni¹

¹University of Texas Health Science Center, Houston, AZ

INVITED

8:30 am–8:45 am

Nanolayered Polymer Films for Programmable Gene Delivery

Sheryl Wang^{1,2} and Paula Hammond^{1,2}

¹Massachusetts Institute of Technology, Cambridge, MA,

²Koch Institute for Integrative Cancer Research, Cambridge, MA

8:45 am–9:00 am

Focused Ultrasound Pre-treatment Augments Brain-Penetrating Nanoparticle-Mediated CNS Transfection via Mechanosensitive TrpA1 Channel Activation

Brian Mead¹, Colleen Curley¹, Namho Kim², Karina Negron², Ji Song¹, G. Wilson Miller¹, William Garrison¹, James Mandell¹, Alexander Klibanov¹, Jung Soo Suk², Justin Hanes², and Richard Price¹

¹University of Virginia, Charlottesville, VA, ²Johns Hopkins University, Baltimore, MD

9:00 am–9:15 am

Using Nucleic Acids to Target Nanoparticles to Drug-Eluting Gel for Local Drug Release

Yevgeny Brudno¹, Michael Aizenberg², and David Mooney³

¹University of North Carolina at Chapel Hill and North Carolina State University, Raleigh, NC, ²Wyss Institute, Boston, MA,

³Harvard University, Cambridge, MA

9:15 am–9:30 am

Iron Sulfide Supraparticles as Artificial Viruses for Gene and Gene Editing Therapies

Emine Turali-Emre¹

¹University of Michigan, Ann Arbor, MI

OP-Sat-1-16

Room A303

Track: Neural Engineering, Stem Cell Engineering

Stem/Progenitor Cells for Neural Applications

Chairs: Courtney Dumont, Nic Leipzig

8:00 am–8:30 am

Cell Surface Sugars Influence Electrophysiological Properties and Fate Potential of Neural Stem Cells

Andrew Yale¹, Alan Jiang¹, Abraham Lee¹, Michael Demetriou¹, and Lisa Flanagan¹

¹University of California, Irvine, Irvine, CA

8:30 am–8:45 am

Regional Specification of hPSC-Derived Dorsal Spinal Sensory Interneurons

Nisha Iyer^{1,2}, Nikolai Fedorchak¹, Stephanie Cuskey², and Randolph Ashton^{1,2}

¹Wisconsin Institute for Discovery, Madison, WI,

²University of Wisconsin-Madison, Madison, WI

8:45 am–9:00 am

Label-free Human Neural Stem Cell Sorting Using Dielectrophoresis

Tayloria Adams¹, Alan Jiang¹, Abraham Lee¹, and Lisa Flanagan¹

¹University of California Irvine, Irvine, CA

9:00 am–9:15 am

Label-free Mouse Neural Stem Cell sorting with a Hydrodynamic Oblique Angle Parallel Electrode Sorter (HOAPES)

Alan Jiang¹, Andrew Yale¹, Estelle Kim¹, Tayloria Adams¹, and Lisa Flanagan¹

¹University of California, Irvine, Irvine, CA

9:15 am–9:30 am

Dental Pulp Stem Cell Sheets as a Neurotrophic Factor Delivery System

Meer Ahmed¹, Matthew Dailey¹, Kristi Rothermund¹, and Fatima Syed-Picard^{1,2}

¹University of Pittsburgh, Pittsburgh, PA,

²McGowan Institute for Regenerative Medicine, Pittsburgh, PA

OP-Sat-1-17

Room A409

Track: Biomedical Engineering Education (BME)

Evidence-based Pedagogy

Chairs: Colin K. Drummond, Devil K. Hubbard

8:00 am–8:15 am

Female Mentorship Before College: The Benefits of the Young Scholar's Program

Tess Torregrosa¹, Claire Duggan¹, Ryan Koppes¹, and Abigail Koppes¹

¹Northeastern University, Boston, MA

8:15 am–8:30 am

Student Satisfaction in an Active Learning BME Physiology Course

Brian Helmke¹ and William Guilford¹

¹University of Virginia, Charlottesville, VA

8:30 am–8:45 am

Multi-Year Meta-Analysis of Team Composition Dynamics within a Yearlong Integrative Laboratory Course

Timothy Allen¹

¹University of Virginia, Charlottesville, VA

8:45 am–9:00 am

The Benefits of Integrating Upperclassmen Mentors with Freshmen Teams Engaged in Active Learning

Eileen Haase¹

¹Johns Hopkins University, Baltimore, MD

9:00 am–9:15 am

What do Students Experience in a Problem-Solving Studio?

Carmen Carrion¹ and Joseph LeDoux¹

¹Georgia Institute of Technology, Atlanta, GA

OP-Sat-1-18

Room A408

Track: Undergraduate Research & Design

Undergraduate Research & Design I

Chairs: Casey Ankeny, Sarah Rooney

8:00 am–8:09 am

Affibody Ligand Based B7-H3-targeted Microbubbles for Ultrasonic Detection of Breast Cancer

Karina Sharma¹, Makenna Laffey¹, Katharine Nottberg¹, Rakesh Bam¹, Katherlyne Wilson¹, and Lotfi Abou-Elkacem¹

¹Stanford University, Palo Alto, CA

8:09 am–8:18 am

Percutaneous Carbon Dioxide-Based Cryoablation in Highly Perfused Porcine Tissue

Grace Kuroki¹, Bailey Surtees¹, Pascal Acree¹, Evelyn McChesney¹, Clarisse Yixin Hu¹, Clifford Weiss¹, Dara Kraitchman¹, and Nicholas Durr¹

¹Johns Hopkins University, Baltimore, MD

8:18 am–8:27 am

Internalization of Folate Receptor Targeting Nanoparticles into Ovarian Cancer Cell Lines

Katherine Haddad¹ and Handan Acar¹

¹The University of Oklahoma, Norman, OK

8:27 am–8:36 am

Design and *In Vivo* Characterization of Kidney-Targeting Multimodal Micelles for Renal Drug Delivery

Sarah Milkowski¹, Jonathan Wang¹, Christopher Poon¹, Deborah Chin¹, Vivian Lu¹, Kenneth Hallows², and Eun Ji Chung^{1,2}

¹University of Southern California, Los Angeles, CA, ²Keck School of Medicine, University of Southern California, Los Angeles, CA

8:36 am–8:45 am

Nickless Base Editors Demonstrate Potential for Future Genome Rewriting and Therapeutic Efforts

Amanda Hornick¹, Cory Smith², Oscar Castanon², Verena Volf², Khaled Said², and George Church²

¹University of Rochester, Rochester, NY, ²Harvard Medical School, Boston, MA

8:45 am–8:54 am

Improving Predictions of Single Carbon Source Utilization in a Model of *Pseudomonas aeruginosa*

Taylor Lewis^{1,2}, Laura Dunphy¹, and Jason Papin¹

¹University of Virginia, Charlottesville, VA, ²University of Massachusetts Amherst, Amherst, MA

8:54 am–9:03 am

Characterizing Dendritic Cell Activation in Response to Alginate Encapsulated Cells

Deepti Singam¹, Ying Li¹, and Cherie Stabler¹

¹University of Florida, Gainesville, FL

9:03 am–9:12 am

Driving Barrier Formation Within Bioengineered Lungs Using a Rotational Seeding System and ECM Coatings

Keerthana Shankar¹, Bethany Young¹, amanda Pellegrino², Cindy Tho¹, and Rebecca Heise¹

¹Virginia Commonwealth University, Richmond, VA

²Duquesne University, Pittsburgh, PA

9:12 am–9:21 am

Investigating the Biological Effects of Oxygen Tension on Lung Epithelial Cells

Ellen Kan¹, Alexander Engler¹, and Laura Niklason¹

¹Yale University, New Haven, CT

9:21 am–9:30 am

Physicochemical Mechanotransduction Regulates Nuclear Mechanics and Morphology Through Heterochromatin Formation

Viswajit Kandula¹, Andrew Stephens¹, and John Marko¹

¹Northwestern University, Evanston, IL

SPECIAL SESSIONS

8:00 am–9:30 am

Room A310

Application of Two Dimensional Materials in Healthcare

Chairs: Aida Ebrahimi

2D materials offer high sensitivity due to large surface area, thin atomic profile, tunable electronic/optical properties, flexibility, mechanical strength, and optical transparency. The distinct chemical and physical properties of 2D materials make them ideal for detecting various biological targets, such as nucleic acids, proteins, and small molecules. In recent years, 2D materials and their composite structure with other nanoscale materials (such as nanoparticles, enzymes, nanotubes) have attracted great attention in various technologies related to healthcare, including biochemical sensors, drug delivery, design of in vivo probes, substrate for immobilization of biomolecules, etc. This Special Session intends to share some of the exciting research efforts in the field on application of 2D materials in healthcare, and can create new collaborative opportunities between the attendees with different areas of expertise, including biomedical engineering, materials science/engineering, electrical engineers, and chemical engineering.

SPECIAL SESSIONS

8:00 am–9:30 am

Room A311

Scientific Advancement in the Biomechanics of Prosthetic Heart Valves

Chair: Ajit Yoganathan

Over the past 60 years, prosthetic heart valves have evolved from mechanical valves to tissue valves implanted surgically, to recent stented tissue valves implanted percutaneously. As one of the major medical devices in clinical cardiovascular disease treatment, prosthetic heart valve has dramatically improved the quality and length of the lives of millions of patients worldwide who otherwise may have no treatment options. Behind its marvelous success, biomedical engineering analysis has played a critical role in improving prosthetic valve design and functionality. In the symposium, we will review and discuss the scientific advancement of prosthetic valve design and the associated engineering analyses done in the past 60 years, ongoing research, and future research directions.

SPECIAL SESSIONS

8:00 am–9:30 am

Room A301

BMES-NSF Special Session on Graduate Research Fellowships Program

Chairs: None

Preregistration Required

BMES and the National Science Foundation (NSF) have partnered to convene a special session focused on NSF's Graduate Research Fellowships Program (GRFP). The goal of the session is to bring together program officers, grantees, reviewers and graduate students to highlight the NSF GRFP and inform undergraduate and graduate students on GRFP guidelines and strategies to develop winning GRFP grant proposals. The session is funded through the National Science Foundation. This material is based upon work supported by the National Science Foundation under Grant No. CBET - 1824363. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.

OP-Sat-2-1

Room A311

Track: Drug Delivery & Intelligent Systems, Cancer Technologies

Cancer Drug Delivery I

Chairs: Abhinav Acharya, Handan Acar

1:30 pm–2:00 pm

Inhibition of Breast Cancer Metastasis by Drug Delivery Design

Debra Auguste¹

¹Northeastern University, Boston, MA



2:00 pm–2:15 pm

Fibrin Stabilisation by a Targeted, Synthetic Polymer Modulates the Brain Metastatic Niche

Heather Gustafson¹, Robert Lamm¹, Drew Sellers¹, Nathan White¹, and Suzie Pun¹

¹University of Washington, Seattle, WA

2:15 pm–2:30 pm

Recognitive, Responsive, and Biodegradable Nanogels for Colorectal Cancer Chemotherapy

John Clegg¹, Julia Dansby¹, Abhijeet Venkataraman¹, Eric Ander¹, Afshan Irani¹, Joann Gu¹, Catherine Ludolph¹, and Nicholas Peppas¹

¹University of Texas at Austin, Austin, TX

2:30 pm–2:45 pm

Platelet-Based Delivery of Apoptosis Ligand TRAIL to Target and Kill Tumor Cells in the Circulation

Nerymar Ortiz Otero^{1,2} and Michael R. King¹

¹Vanderbilt University, Nashville, TN, ²Cornell University, Ithaca, NY

2:45 pm–3:00 pm

Transport of Nanoparticles through the Cerebrospinal Fluid for Delivery to Leptomeningeal Metastasis in Medulloblastoma

Kyle Householder^{1,2}, Shruti Dharmaraj², Sierra Bichler¹, Robert Wechsler-Reya³, and Rachael Sirianni^{1,2}

¹Barrow Neurological Institute, Phoenix, AZ, ²Arizona State University, Tempe, AZ, ³Sanford Burnham Prebys Medical Discovery Institute, La Jolla, CA

OP-Sat-2-2

Room A312

Track: Biomaterials

Biomaterials for Immunoengineering II

Chairs: Ankur Singh, Michael Mitchell

1:30 pm–1:45 pm

Localized, Sustained Immunomodulation of the Tumor Microenvironment via Micellar Delivery Vehicles

Nicholas Karabin¹, Siqi Chen², Sophia Li¹, Sijia Yi¹, Bin Zhang², and Evan Scott¹

¹Northwestern University, Evanston, IL, ²Northwestern University Feinberg School of Medicine, Chicago, IL

1:45 pm–2:00 pm

Regional Association of Leukocyte Subpopulation Infiltration in Primary and Metastatic Tumors in an Orthotopic Prostate Cancer Model

Korie Grayson^{1,2} and Michael King¹

¹Vanderbilt University, Nashville, TN, ²Cornell University, Ithaca, NY

2:00 pm–2:15 pm

Epigenetic Consequences of Biomaterial Design on Macrophage Inflammatory Response

Zachary Reitz¹, Praveen K. Veerasubramanian¹, Hamza Atcha¹,

Thuy Luu¹, Wendy Liu¹, and Timothy L. Downing¹

¹University of California, Irvine, Irvine, CA

2:15 pm–2:30 pm

A Dual-sized Biomaterial Particulate System that Modulates Dendritic Cells *In Vivo* for Rheumatoid Arthritis Immunotherapy

Riley Allen¹, Shawn Chizari¹, Jeff Ma¹, Siba Raychaudhuri², and

Jamal Lewis¹

¹UC Davis, Davis, CA, ²UC Davis Medical Center, Sacramento, CA

2:30 pm–2:45 pm

Multifunctional Protocells Capable of Simultaneous Therapeutic ROS Scavenging and MR imaging in Intracerebral Hemorrhage

Bong Geun Cha¹, Han-gil Jeong², Dong-Wan Kang², Myong-Joo Nam¹,

Chi Kyung Kim², Do Yeon Kim², In-Young Choi², Seul Ki Ki²,

Jaeyun Kim¹, and Seung-Hoon Lee²

¹SungKyunKwan University, Suwon, Korea, Republic of, ²Seoul National

University Hospital, Seoul, Korea, Republic of

2:45 pm–3:00 pm

Redirecting Monocyte-Derived Macrophage Behavior To Modulate Secondary Injury Pathology Following Traumatic Brain Injury

Kathryn Wofford^{1,2,3}, Bhavani Singh¹, Kevin Browne^{2,3}, Kara Spiller¹, and

Kacy Cullen^{2,3}

¹Drexel University, Philadelphia, PA, ²Corporal Michael J. Crescenz VA Medical Center, Philadelphia, PA, ³University of Pennsylvania, Philadelphia, PA

OP-Sat-2-3

Room A410

Track: Cancer Technologies, Drug Delivery & Intelligent Systems

Drug Delivery and Immunodulation

Chairs: Ashish Kulkarni, Silviya Zustiak

1:30 pm–1:45 pm

Programming Tumor-clearing Macrophages with Targeted *In Situ* Gene Therapy

Fan Zhang¹, Michael Coon¹, Sirkka Stephan¹, Smitha Pankajavally¹

Somanathan Pillai¹, and Matthias Stephan^{1,2}

¹Fred Hutchinson Cancer Research Institute, Seattle, WA,

²University of Washington, Seattle, WA

1:45 pm–2:00 pm

Photothermal Therapy Generates a Thermal Window of Immunogenic Cell Death in Neuroblastoma

Elizabeth Sweeney¹, Juliana Cano-Mejia^{1,2}, and Rohan Fernandes¹

¹George Washington University, Washington, DC,

²University of Maryland, College Park, MD

2:00 pm–2:15 pm

Computationally-designed Supramolecular Nanotherapeutics for Immune Modulation in Cancer

Anujan Ramesh¹, Vineethkrishna Chandrasekar²,

Siva Kumar Natarajan², Shiladitya Sengupta², and Ashish Kulkarni¹

¹University of Massachusetts Amherst, Amherst, MA, ²Harvard Medical School, Cambridge, MA

2:15 pm–2:30 pm

Leveraging MR Image-guided Focused Ultrasound to Potentiate Immunotherapy for Glioblastoma

Natasha Sheybani¹, Alexandra Witter¹, William Garrison¹, G. Wilson Miller¹, Timothy Bullock¹, and Richard Price¹
¹University of Virginia, Charlottesville, VA

2:30 pm–2:45 pm

Controlled Release Depots for Optimizing Intratumoral Immunotherapy

Kyle M. Garland¹, Sema Sevimli¹, Lihong Wang Bishop¹, Mohamed Wehbe¹, Kyle W. Becker¹, and John T. Wilson¹
¹Vanderbilt University, Nashville, TN

2:45 pm–3:00 pm

Nano-Lipopeptisomes: Anticancer Peptide-Assembled Nanoparticles for Fusolytic Oncotherapy

Matthew Aronson¹, Andrew Simonson¹, and Scott Medina¹
¹The Pennsylvania State University, State College, PA

OP-Sat-2-4

Room A313

Track: Biomechanics

Injury Biomechanics I

Chairs: Andrew Kemper, Alok Shah

1:30 pm–1:45 pm

Chest and Lumbar Injury Metric Sensitivity to Spaceflight Landing Condition

James Gaewsky¹, Derek Jones¹, Xin Ye¹, Bharath Koya¹, Mona Saffarzadeh¹, Kyle McNamara¹, Scott Gayzik¹, Ashley Weaver¹, and Joel Stitzel¹
¹Virginia Tech–Wake Forest University, Winston-Salem, NC

1:45 pm–2:00 pm

Articular Cartilage Biomechanics and Lubrication Following Mechanical Injury

Margot Farnham¹, Riley Larson¹, David Burris¹, and Christopher Price¹
¹University of Delaware, Newark, DE

2:00 pm–2:15 pm

Biomechanical Responses of Neonatal Brachial Plexus During Stretch

Rachel Magee¹ and Anita Singh¹
¹Widener University, Chester, PA

2:15 pm–2:30 pm

Pedestrian Impact Injury Risk Curves for a U.S. Fleet

Samantha Haus¹ and Hampton Gabler¹
¹Virginia Tech, Blacksburg, VA

2:30 pm–2:45 pm

Assessing the Ability of Lacrosse Helmets to Reduce Risk of Head Injury

Emily Kieffer¹, Megan Bland¹, and Steven Rowson¹
¹Virginia Tech, Blacksburg, VA

2:45 pm–3:00 pm

Injury-influenced Measurements and Incorrect Censoring May Bias Injury Risk Curves from Post-Mortem Human Subject Experiments

Scott Gayzik¹, Alexander Baker¹, and Fang-Chi Hsu¹
¹Wake Forest School of Medicine, Winston-salem, NC

OP-Sat-2-5

Room A314

Track: Biomechanics

Computational and Multiscale Modeling in Biomechanics

Chairs: Pam VandeVord, Eric Kennedy

1:30 pm–1:45 pm

Effects of Chondral Defects and Labral Delamination on Transient Mechanics of Cartilage in the Hip

Jocelyn Todd¹, Jeffrey Weiss¹, and Travis Maak¹
¹University of Utah, Salt Lake City, UT

1:45 pm–2:00 pm

Computational Approaches to Determine Muscle-Generated Feasible Endpoint Forces Constraining Capabilities of Human Movement

Aravind Sundararajan¹, Ashley Rice¹, and Jeffrey Reinbolt¹
¹University of Tennessee, Knoxville, TN

2:00 pm–2:15 pm

Computational Systems Mechanobiology of Pressure Ulcer Formation

Vivek Sree¹, Manuel Rausch², and Adrian Buganza Tepole³
¹Purdue University, West Lafayette, IN, ²The University of Texas at Austin, Austin, TX, ³Purdue University, West Lafayette, IN

2:15 pm–2:30 pm

Predicting the Biomechanical Response of the Pediatric Thoracic Spine

James Peters¹ and Sriram Balasubramanian¹
¹Drexel University, Philadelphia, PA

2:30 pm–2:45 pm

Personalized Simulation of Reconstructive Surgery in the Presence of Material Behavior Uncertainty

Taeksang Lee¹, Sergey Turin², Arun Gosain², Ilias Bilionis¹, and Adrian Buganza Tepole¹
¹Purdue University, West Lafayette, IN, ²Northwestern University, Chicago, IL

2:45 pm–3:00 pm

Optimized ACL Repair and Reduced Tear by a 3-D Finite Element Analysis.

Amna Haider¹, Bryan Musmacker¹, Yusef Saad-Eldin¹, Belinda Tang¹, Bruce Coluccio¹, Chaudhry Hassan¹, and Yi-Xian Qin¹
¹Stony Brook University, Stony Brook, NY

OP-Sat-2-6

Room A315

Track: Biomedical Imaging and Instrumentation

MRI I

Chairs: Keigo Kawaji, Zhipeng Cao

1:30 pm–1:45 pm

Use of MRI to Measure and Map Interstitial Fluid Flow in the Glioma Microenvironment: Correlation to Anatomical and Histological Features

Jennifer Munson¹ and Kathryn Kingsmore²
¹Virginia Tech, Blacksburg, VA, ²University of Virginia, Charlottesville, VA



1:45 pm–2:00 pm

Computational Fluid Dynamics Characterizing Flow Through Breast Tumors Using Patient-specific Geometries

Chengyue Wu¹, David Hormuth¹, Federico Pineda², Gregory Karczmar², and Thomas Yankeelov¹
¹the University of Texas at Austin, Austin, TX, ²The University of Chicago, Chicago, IL

2:00 pm–2:15 pm

Quantitative Effects of Geometric Distortion on Stiffness Estimation with MR Elastography

Grace McIlvain¹, Matthew D.J. McGarry², and Curtis L Johnson¹
¹University of Delaware, Newark, DE, ²Dartmouth College, Hanover, NH

2:15 pm–2:30 pm

A Personalized Treatment For Autism Spectrum Disorder Using Task-Based Functional-MRI

Mohamed Ali¹, Omar Dekhil¹, Ahmed Shalaby¹, Robert Keynton¹, Mohammed Ghazal¹, Gregory Barnes¹, and Ayman El-Baz¹
¹University of Louisville, Louisville, KY

2:30 pm–2:45 pm

Enhanced Resolution through Ringing Suppression in Magnetic Resonance Imaging

F Jeffrey S. Arndt¹ and Lauren N. Hirt¹
¹IAI, LLC, Chantilly, VA

2:45 pm–3:00 pm

Pediatric Cerebral Palsy Exhibits Diminished Brain Tissue Stiffness

Charlotte Chaze¹, Gabrielle Villermaux¹, Daniel Smith¹, Grace McIlvain¹, Peyton Delgorio¹, Nicole Maguire¹, Freeman Miller², Jeremy Crenshaw¹, and Curtis Johnson¹
¹University of Delaware, Newark, DE, ²Alfred I duPont Hospital for Children, Wilmington, DE

OP-Sat-2-7

Room A316

Track: Biomedical Imaging and Instrumentation

Theranostic and Imaging Contrast Agents

Chairs: Xiaolin Nan, Carolina Salvador-Morales

1:30 pm–1:45 pm

Assessing Accumulation Mechanism of Multifunctional PLGA Nanoparticles in Traumatic Brain Injury

Aria Tarudji¹, Alex Magsam¹, and Forrest Kievit¹
¹University of Nebraska-Lincoln, Lincoln, NE

1:45 pm–2:00 pm

Laser Activated Perfluorocarbon Nanodroplets as a New Tool for Applications in the Central Nervous System

Kristina Hallam^{1,2}, Eleanor Donnelly², and Stanislav Emelianov^{1,2}
¹Georgia Institute of Technology and Emory University School of Medicine, Atlanta, GA, ²Georgia Institute of Technology, Atlanta, GA

2:00 pm–2:15 pm

Real-time Sensors for Non-invasive Monitoring of Cell Therapies

Derek Hernandez¹, Kabir Dhada¹, and Laura Suggs¹
¹The University of Texas at Austin, Austin, TX

2:15 pm–2:30 pm

Controlled Aggregation of Gold-Silica Janus Nanoparticles for Multiwavelength Photoacoustic Imaging

Diego Dumani¹, Ji Hun Park², ammar Arsiwala³, Stanislav Emelianov¹, and Ravi Kane³
¹Georgia Institute of Technology & Emory University, Atlanta, GA, ²Ewha Womans University, Seoul, Korea, Republic of, ³Georgia Institute of Technology, Atlanta, GA

2:30 pm–2:45 pm

Biomolecular Engineering of Acousto-magnetic Protein Nanostructures for Non-invasive Imaging of Cellular Function

George Lu¹, Arash Farhadi¹, Jerzy Szablowski¹, Audrey Lee-Gosselin¹, Samuel Barnes², Anu Lakshmanan¹, Raymond Bourdeau¹, and Mikhail Shapiro¹
¹California Institute of Technology, Pasadena, CA, ²Loma Linda University, Loma Linda, CA

OP-Sat-2-8

Room A302

Track: Tissue Engineering, Nano and Micro Technologies

Organ-on-Chip for Regenerative Medicine II

Chairs: Evangelia Bellas, Hyun Jung Kim

1:30 pm–1:45 pm

Fatty Acid Based Media Enhances Maturity and Ability to Predict Pharmacology in Human iPS-Cell Derived Cardiomyocyte Based Microphysiological Systems

Nate Huebsch^{1,2}, Berenice Charrez², Brian Siemons², Steven Boggess², Felipe Lee Montiel², Nicholas Jeffries², Nikhil Deveshwar², Jonathan Serrano³, Matija Snuderl³, Andreas Stahl², Evan Miller², and Kevin Healy²

¹Washington University in St. Louis, Saint Louis, MO, ²University of California, Berkeley, Berkeley, CA, ³New York University, New York, NY

1:45 pm–2:00 pm

Microengineering of a Three-Dimensional Heart on Chip Tissue Model

Jaimeson Veldhuizen¹, Joshua Cutts¹, Zachery Camacho¹, David Brafman¹, Raymond Migrino², and Mehdi Nikkhah¹

¹Arizona State University, Tempe, AZ, ²Phoenix Veteran Affair Health Care System, Phoenix, AZ

2:00 pm–2:15 pm

Perfused Tissue-On-A-Chip for Studying Angiogenesis

Jessica Motherwell¹, Prasad Katakam¹, and Walter Murfee²

¹Tulane University, New Orleans, LA, ²University of Florida, Gainesville, FL

2:15 pm–2:30 pm

Microfluidic Testing of a Cell Therapy for Hemophilia

Brady Trevisan¹, Julio Aleman Hernandez¹, Chris Doering², Trent Spencer², Anthony Atala¹, Chris Porada¹, and Graca Almeida-Porada¹

¹Wake Forest Institute for Regenerative Medicine, Winston-Salem, NC, ²Emory University, Atlanta, GA

2:30 pm–2:45 pm

Flexible, Foldable and Reconfigurable Paper-based Angiogenesis Chip towards Developing Personalized Cancer Therapeutic Strategies

Kattika Kaarj¹, Marianne Madias¹, Soohee Cho¹, and Jeong-Yeol Yoon¹

¹University of Arizona, Tucson, AZ

2:45 pm–3:00 pm

Effects of Statin-Induced Myopathy in a Human Skeletal Microphysiological System

Anandita Ananthakumar¹, Cristina Fernandez¹, Deepak Voora², and George Truskey¹

¹Duke University, Durham, NC, ²Duke University Medical Centre, Durham, NC

OP-Sat-2-9

Room A305

Track: Device Technologies and Biomedical Robotics

Wearable and Implantable Sensor Technology

Chair: J-C Chiao

1:30 pm–1:45 pm

"Self-Cleaning" Hydrogel Membranes to Extend the Lifetime of Glucose Biosensors

Ping Dong¹, A. Kristen Means¹, Courtney Shrode¹, Bradley Schott¹, Andrea Locke¹, Gerard Cote¹, and Melissa G¹

¹Texas A&M University, College Station, TX

1:45 pm–2:00 pm

Printed, Flexible pH Sensor Hydrogels for Biomedical Applications

Sina Naficy¹, Farshad Oveissi¹, Bianca Patrick¹, Aaron Schindeler^{1,2}, and Fariba Dehghani¹

¹The University of Sydney, Sydney, Australia, ²The Children's Hospital at Westmead, Sydney, Australia

2:00 pm–2:15 pm

Development of an Optical Enzymatic Biosensor for Continuous Monitoring of Uric Acid

Tokunbo Falohun¹ and Mike McShane¹

¹Texas A&M University, College Station, TX

2:15 pm–2:30 pm

Comparison and Integration of SMG and EMG

Luis G. Rosa¹, Keshav Bimbraw¹, Frank L. Hammond III¹, and Gil Weinberg¹

¹Georgia Institute of Technology, Atlanta, GA

2:30 pm–2:45 pm

Motion Artifact Tailoring in a Wearable and Continuous Pulse Oximeter with Wireless Communication

Pedro Chacón¹, Limeng Pu¹, Hsiao-Chun Wu¹, Brian Irving¹, and Jin-Woo Choi¹

¹Louisiana State University, Baton Rouge, LA

2:45 pm–3:00 pm

Biodegradable Piezoelectric Force Sensor

Eli Curry¹ and Thanh Nguyen¹

¹University of Connecticut, Storrs, CT

OP-Sat-2-10

Room A401

**Track: Cardiovascular Engineering,
Stem Cell Engineering**

Cardiovascular Stem Cells and Regeneration

Chairs: Megan McCain, Nathaniel Huebsch

1:30 pm–1:45 pm

Prevention of Myocardial Calcification in Ischemic Myocardial Injury

Shu Liu¹ and Yu Wu¹

¹Northwestern University, Evanston, IL

1:45 pm–2:00 pm

Non-Coding Genomic Regulation Identified in Mechanically Stressed Human Cardiomyocytes

Aditya Kumar¹, Stephanie Thomas¹, Kirsten Wong¹, Valentina Lo Sardo², Daniel Cheah¹, Yang-Hsun Hou¹, Jesse Placone¹, Kevin Tenerelli¹, William Ferguson², Ali Torkamani^{2,3}, Eric Topol^{2,3}, Kristin Baldwin², and Adam Engler^{1,4}

¹UC San Diego, La Jolla, CA, ²The Scripps Research Institute, La Jolla, CA, ³The Scripps Translational Science Institute, La Jolla, CA, ⁴Sanford Consortium for Regenerative Medicine, La Jolla, CA

2:00 pm–2:15 pm

NANOG Rejuvenates the Impaired Collagen Expression with Aging Through Directly Binding to SMADs Promoters and Proteins

Na Rong¹, Panagiotis Mistriotis^{1,2}, Xiaoyan Wang¹, Georgios Tseropoulos¹, Nika Rajabian¹, and Stelios T Andreadis¹

¹University at Buffalo, Buffalo, NY, ²Johns Hopkins University, Baltimore, MD

2:15 pm–2:30 pm

Macrophages Affect Cardiomyocyte Calcium Handling Function via Extracellular Matrix Protein Expression

Pamela Hitscherich¹, Lai-Hua Xie², and Eun Jung Lee¹

¹New Jersey Institute of Technology, Newark, NJ, ²Rutgers New Jersey Medical School, Newark, NJ

2:30 pm–2:45 pm

Engineered Heart Slices Represent Syncytial Model Of Arrhythmogenic Cardiomyopathy

Justin Lowenthal¹, Adriana Blazeski¹, Yin Wang¹, Renjun Zhu¹, Sharon Gerecht², and Leslie Tung¹

¹Johns Hopkins University School of Medicine, Baltimore, MD, ²Johns Hopkins University, Baltimore, MD

2:45 pm–3:00 pm

Small-Molecule Inhibition of GSK3 Stimulates Cardiomyocyte Proliferation in Monolayers and Engineered Cardiac Tissues

Ryne Gorsuch¹, Soonchul Heo¹, Jennifer Kwon¹, Charles Gersbach², and Nenad Bursac¹

¹Duke University, Durham, NC, ²Duke University, Durham, ND

OP-Sat-2-11

Room A403

Track: Nano and Micro Technologies

Micro and Nano-Fluidic Engineering and Bioinspired Nano Devices

Chairs: Yubing Sun, Anthony Kim

1:30 pm–1:45 pm

A Microfluidic Assay for High Resolution Quantitation of Dynamic Neutrophil Responses to Pathogens

Eric Leaman¹, Alvin Aung¹, Alexie Jacques², and Bahareh Behkam¹

¹Virginia Tech, Blacksburg, VA, ²Virginia Western Community College, Roanoke, VA

1:45 pm–2:00 pm

Nanozyme Integrated POCT Biosensing Platform Combined with a Glucometer for Non-Glucose Biomarker Detection

Chenzhong Li^{1,2}, Xunan Zhu¹, Maedeh Mozneb¹, and Mehenur Sarwar¹

¹Florida International University, Miami, FL, ²National Science Foundation, Washington DC, DC

2:00 pm–2:15 pm

Designing Magnetic Cilia that Exhibit Metachronal Motion

Srinivas Hanasoge¹, Alexander Alexeev¹, and Peter J. Hesketh¹

¹Georgia Tech, Atlanta, GA

2:15 pm–2:30 pm

A Porous Hollow Fiber for Acute Myocardial Infarction Diagnosis with On-Tube Blood Separation and Sensing Capabilities

Dajing Chen¹, Jin Zhou², Cang Wang², Tian Xie¹, and Xiaojun Huang²

¹Hangzhou Normal University, Hangzhou, China, People's Republic of, ²Zhejiang University, Hangzhou, China, People's Republic of

2:30 pm–2:45 pm

Micro-chip ELISA Platform for Detecting Multiple Cardiac Biomarkers

Mehmet Ozgun Ozen^{1,2}, Francois Haddad^{2,3}, Joseph C. Wu^{2,3}, and Utkan Demirci^{1,2}

¹Stanford University School of Medicine, Palo Alto, CA, ²Stanford Cardiovascular Institute, Stanford, CA, ³Stanford University School of Medicine, Stanford, CA

2:45 pm–3:00 pm

Microfluidic-integrated Microclot Array Elastometry (clotMAT) to Study Blood Clot Micromechanics

Zhaowei Chen¹, Jiankai Lu¹, Changjie Zhang¹, Isaac Hsia¹, Sriram Neelamegham¹, and Ruogang Zhao¹

¹University at Buffalo, State University of New York, Buffalo, NY

OP-Sat-2-12

Room A404

Track: Cellular and Molecular Bioengineering, Tissue Engineering

Engineering Multi-Cellular Systems

Chairs: Allyson Sgro, Ethan Lippmann

1:30 pm–1:45 pm

Blood-Brain Barrier Model on a Microfluidic Chip for the Study of Tumor Cell Extravasation

Cynthia Hajal¹ and Roger Kamm¹
¹MIT, Cambridge, MA

1:45 pm–2:00 pm

Glial Cells Modulate Cardiac Beating: An *In Vitro* and *In Silico* Model

Jonathan Soucy¹, Abigail Koppes¹, Nasim Annabi^{1,2}, and Ryan Koppes¹
¹Northeastern University, Boston, MA, ²Massachusetts Institute of Technology, Cambridge, MA

2:00 pm–2:15 pm

Novel Insights into Emergent Morphogenic Behaviors of Specific Breast Cancer Mutations in a 3D Biomimetic Mammary Duct Platform

Matthew Kutys^{1,2}, William Polacheck³, Michaela Welch¹, and Christopher Chen^{1,2}
¹Boston University, Boston, MA, ²Harvard University, Boston, MA, ³University of North Carolina, Chapel Hill, NC

2:15 pm–2:30 pm

Brain-on-a-Chip for Traumatic Brain Injury Drug Discovery

Anton Omelchenko¹, Anil Shrirao¹, Liam Hiester¹, Rene Schlossl, Jeffrey Zahn¹, Martin Yarmush¹, and Bonnie Firestein¹
¹Rutgers, the State University of New Jersey, Piscataway, NJ

2:30 pm–2:45 pm

Assessing the Effects of Dietary Factors, Inflammation, and Bacteria on Intestinal Function in an *In Vitro* model

Mridu Malik¹ and Gretchen Mahler¹
¹Binghamton University, Binghamton, NY

2:45 pm–3:00 pm

Molecular Through Multicellular Tools to Harness the Epigenome

Albert Keung¹
¹North Carolina State University, Raleigh, NC

OP-Sat-2-13

Room A405

Track: Nano and Micro Technologies

Micro/Nano Tools for Cell Sorting, Disease Detection and Diagnosis

Chairs: Daniel Heller, Kaz Hoshino

1:30 pm–1:45 pm

High-Throughput Acoustic Separation of Circulating Tumor Cells

Mengxi Wu^{1,2}, Po-Hsun Huang², Chuyi Chen², and Tony Hunag²
¹Pennsylvania State University, State College, PA, ²Duke University, Durham, NC

1:45 pm–2:00 pm

Engineering DNA Gates For Extensible, Multiplexed Cell Sorting

Shreyas Dahotre¹, Yun Min Chang^{1,2}, Andreas Wieland², Samantha Stammen¹, and Gabriel Kwong¹
¹Georgia Institute of Technology, Atlanta, GA, ²Emory University, Atlanta, GA

2:00 pm–2:15 pm

Label-Free Ferrohydrodynamic Cell Separation of Circulating Tumor Cells

Leidong Mao¹
¹University of Georgia, Athens, GA

2:15 pm–2:30 pm

Diagnosing Breast Cancer with Your Microfluidic Invasion Network Device (MIND): Prognosis and Precision Care

Christopher Yankaskas¹, Keyata Thompson², Colin Paul¹, Panagiotis Mistrionis¹, Ankit Mahendra³, Vivek Bajpai⁴, Daniel Shea¹, Kristen Manto¹, Andreas Chai¹, Navin Varadarajan³, Michele Vitolo², Aikaterini Kontrogianni-Konstantopoulos², Stuart Martin², and Konstantinos Konstantopoulos¹
¹The Johns Hopkins University, Baltimore, MD, ²University of Maryland School of Medicine, Baltimore, MD, ³University of Houston, Houston, TX, ⁴Stanford University, Stanford, CA

2:30 pm–2:45 pm

Quantifying Mitochondrial Phenotype by Label-Free Single-Cell Impedance Cytometry to Stratify Pancreatic Tumorigenicity

John McGrath¹, John Moore¹, Jennifer Kashatus¹, Sarah Adair², Todd Bauer¹, David Kashatus¹, and Nathan Swami¹
¹University of Virginia, Charlottesville, VA, ²University of Virginia, Charlottesville, VA

2:45 pm–3:00 pm

Non-Invasive Detection of Ovarian Cancer Via an Optical Nanosensor Implant

Daniel Heller^{1,2}, Ryan Williams¹, Thomas Galassi^{1,2}, Jackson Harvey^{1,2}, Janki Shah¹, and Douglas Levine³
¹Memorial Sloan Kettering Cancer Center, New York, NY, ²Weill Cornell Medicine, New York, NY, ³NYU Langone Medical Center, New York, NY

OP-Sat-2-14

Room A406

Track: Translational Biomedical Engineering, Biomedical Imaging and Instrumentation

Imaging Technologies and Image-Guided Therapies

Chairs: Dawen Zhao

**1:30 pm–1:45 pm
Evaluation of Surface Feature Persistence during Lung Surgery**

Paul Thienphrapa¹, Torre Bydlon¹, Alvin Chen¹, and Aleksandra Popovic¹
¹Philips Research, Cambridge, MA

**1:45 pm–2:00 pm
Tissue Oxygenation To Assess Healing Diabetic Foot Ulcers and Effectiveness of Scalpel Debridement**

Anuradha Godavarty¹, Kevin Leiva¹, Kacie Kaile¹, Jadadeesh Mahadevan¹, Dinesh Khandavilli¹, Sivakumar Narayanan², Varalakshmi Muthukrishnan², and Mohan Viswanathan²
¹Florida International University, Miami, FL, ²Mohan Diabetes Specialties Center, Chennai, India

**2:00 pm–2:15 pm
Human Retinal Oxygenation Imaging Using Visible-Light Optical Coherence Tomography**

Hao Zhang¹, Xiao Shu¹, Brian Soetikno¹, and Amani Fawzi¹
¹Northwestern University, Evanston, IL

**2:15 pm–2:45 pm
Mueller Matrix Imaging of the Extracellular Matrix with In Situ Correlation to Structure through Non-linear Microscopy**

Jessica Ramella-Roman¹
¹Florida International University, Miami, FL



OP-Sat-2-15

Room A407

Track: Drug Delivery & Intelligent Systems

Targeted or Responsive Delivery Systems

Chairs: Anita Shukla, Samuel Senyo

**1:30 pm–2:00 pm
Delivering Instructive Cues to Development-mimetic Cellular Condensations for Modular Engineering of Complex Tissues**

Eben Alsberg¹
¹Case Western Reserve University, Cleveland, OH



**2:00 pm–2:15 pm
Microbe Responsive Biomaterials for Antimicrobial Drug Delivery**

Anita Shukla¹
¹Brown University, Providence, RI

**2:15 pm–2:30 pm
Epitope-functionalized Nanoparticles for Entrapment of Autism Autoantibodies**

Amir Bolandparvaz¹, Elizabeth Edmiston¹, Kenneth Alvarez¹, Judy Van De Water², and Jamal Lewis¹
¹UC Davis, Davis, CA, ²M.I.N.D. (Medical Investigation of Neurodevelopmental Disorders) Institute, Davis, CA

2:30 pm–2:45 pm

Quinidine-Polymer Conjugate Binds P-glycoprotein and Inhibits P-glycoprotein Mediated Drug Efflux

Sarah Snyder¹, Lindsey Crawford¹, and David Putnam¹
¹Cornell University, Ithaca, NY

2:45 pm–3:00 pm

Synthesis and Characterization of Targeted pH-Sensitive PEG-PHEMA-PBA Based Crosslinked Micelles for Regulation of Doxorubicin Release

Mohamed Mohamed^{1,2}, Ajay Singh¹, Ahmed El-Sokkary², Magda Akl², Paras Prasad¹, and Chong Cheng¹
¹University at Buffalo, Buffalo, NY, ²Mansoura University Mansoura, Egypt

OP-Sat-2-16

Room A303

Track: Neural Engineering, Biomechanics

Traumatic Brain Injury Biomechanics and Neuromuscular Biomechanics

Chairs: Bryan Pfister, Kacy Cullen

1:30 pm–1:45 pm

Brain Mechanical Properties Over the Course of a Collegiate Hockey Season Measured with MR Elastography

Daniel Smith¹, Melissa DiFabio¹, Peyton Delgorio¹, Charlotte Chaze¹, Elizabeth Dickinson¹, Nicole Maguire¹, Thomas Buckley¹, and Curtis Johnson¹
¹University of Delaware, Newark, DE

1:45 pm–2:00 pm

Acute Multimodal Outcomes in a Heterogeneous Preclinical Rat Model of mTBI

Kyle Milligan¹, Scott Hogan¹, Eric Gaupp¹, Facundo Fernandez¹, and Michelle LaPlaca²
¹Georgia Institute of Technology, Atlanta, GA, ²Georgia Institute of Technology/Emory University, Atlanta, GA

2:00 pm–2:15 pm

Behavioral Deficits in a Combined Model of Blast and Blunt Traumatic Brain Injury

Aswati Aravind¹, Julianna Kosty¹, Michael Dolegiewitz¹, Maciej Skotak¹, Eren Alay¹, Namas Chandra¹, Kevin Pang², and Bryan Pfister¹
¹New Jersey Institute of Technology, Newark, NJ, ²Neurobehavioral Research Lab, Department of Veteran Affairs Medical Center-New Jersey Health Care System, East Orange, NJ

2:15 pm–2:30 pm

Balancing Human Ankle Motion using Implanted Tibial and Fibular Nerve Cuffs

Christopher Delianides¹, Breanne Christie¹, Dustin Tyler^{1,2}, Gilles Pinaut^{1,2}, and Ronald Triolo^{1,2}
¹Case Western Reserve University, Cleveland, OH, ²Louis Stokes Cleveland Department of Veterans Affairs Medical Center, Cleveland, OH

2:30 pm–2:45 pm

Regaining Trunk Stability After Spinal Cord Injury

Mrinal Rath¹, Dimitry Sayenko¹, Yury Gerasimenko^{1,2}, and Victor Edgerton¹
¹UCLA, Los Angeles, CA, ²Pavlov Institute of Physiology, St. Petersburg, Russian Federation

2:45 pm–3:00 pm

Dissociation of Muscle and Cortical Response Scaling to Balance Perturbation Acceleration

Aiden Payne¹, Greg Hajcak², and Lena Ting³
¹Georgia Tech and Emory University, Atlanta, GA, ²Florida State University, Tallahassee, FL, ³Emory University, Atlanta, GA

OP-Sat-2-17

Room A304

Track: Bioinformatics, Computational and Systems Biology, Cancer Technologies

Computational Modeling of Cancer

Chairs: Matthew Lazzara, Stacey Finley

1:30 pm–1:45 pm

Alternatively Activated Macrophage Secretome Modulates Metastatic Potential of Ovarian Cancer Cells

Kaitlin Fogg¹, Will Olson¹, and Pamela Kreeger¹
¹University of Wisconsin–Madison, Madison, WI

1:45 pm–2:00 pm

Paradox Of Proteolytic Inhibitors in Tthe Tumor Microenvironment: Mathematical Models to Probe Unexpected Cellular Responses Between Breast Cancer Cells and Tumor Associated Macrophages

W. Andrew Shockey¹, Chris A. Kieslich¹, Catera L. Wilder², Ken Brandon¹, Valencia Watson¹, and Manu O. Platt¹
¹Georgia Institute of Technology and Emory University, Atlanta, GA, ²University of California, Los Angeles, Los Angeles, CA

2:00 pm–2:15 pm

Binding Free Energy Analysis of Programmed Cell Death Protein PD1 to its Ligand PD-L1

Peter Pan¹, Alireza Tafazzol¹, Xianwei Zhang¹, and Yong Duan¹
¹University of California Davis, Davis, CA

2:15 pm–2:30 pm

How Ligand Binding Alters the Dynamics of Toll-like Receptor 4: A Molecular Dynamics Simulation

Alireza Tafazzol¹ and Yong Duan¹
¹Department of Biomedical Engineering and Genome Center, University of California, Davis, Davis, CA

2:30 pm–2:45 pm

Stochastic Co-Evolution of Tumor Progression and Immune System Quantifies Immunotherapy Efficacy

Jason George^{1,2} and Herbert Levine¹
¹Rice University, Houston, TX, ²Baylor College of Medicine, Houston, TX

2:45 pm–3:00 pm

Mechanistic Understanding of Clonal Heterogeneity in Chronic Myelomonocytic Leukemia

Meghan Ferrall-Fairbanks¹, Gregory Kimmel¹, Eric Padron¹, and Philipp Altrock¹
¹Moffitt Cancer Center and Research Institute, Tampa, FL

OP-Sat-2-18

Room A412

Track: Device Technologies and Biomedical Robotics, Translational Biomedical Engineering

Device Applications and Translation

Chairs: Grant Kruger, Jacqueline Linnes

1:30 pm–1:45 pm

Performance Evaluation of Tissue Containment Bags for Power Morcellation

Alexander Herman¹, Nandini Duraiswamy¹, Danielle Fau¹, Poulomi Nandy¹, and Prasanna Hariharan¹
¹U.S. Food and Drug Administration, Silver Spring, MD

1:45 pm–2:00 pm

Monitoring Burn Wound Dressings in Nigeria

Matthew Glucksberg¹, Alexander Boe¹, Prachi Keni¹, Kanav Kumar¹, Jennifer Lor¹, Osita Anayache², and Afieharo Michael³
¹Northwestern University, Evanston, IL, ²University of Ibadan, Ibadan, Nigeria, ³University College Hospital, Ibadan, Ibadan, Nigeria

2:00 pm–2:15 pm

Stapedotomy Simulator for Training Otolaryngologist Residents

Ruth Ochia¹, Brandon Kamrava^{1,2}, Steven Zuniga², Haeju Son¹, Nahyun Son¹, Sierra Drummond¹, Devin Pittman¹, and Pamela Roehm²
¹Temple University, Philadelphia, PA, ²The Lewis Katz School of Medicine at Temple University, Philadelphia, PA

2:15 pm–2:30 pm

Measurement of Triple Jump Kinematics Using Wearable Piezoresistive Strain Sensors

David Wood¹, David T Fullwood¹, and Anton Bowden¹
¹Brigham Young University, Provo, UT

2:30 pm–2:45 pm

Quantifying Sleep Architecture Through Respiratory Behavior Using Non-Contact Electric Field Sensors

Heidi Kloefkorn¹, Lauren Aiani¹, Bill Goolsby¹, Nigel Pedersen¹, and Shawn Hochman¹
¹Emory University, Atlanta, GA

2:45 pm–3:00 pm

An Integrated Blood Collector and a Thermal Shipping Box for Enabling Novel Healthcare Logistics

Jian Gu¹, Alan Norquist¹, Brett Duane¹, Jerome Lacombe¹, Mikhail Repin², Sanjay Mukherjee², Sally amundson², David Brenner², and Frederic Zenhausern¹
¹UA College of Medicine-Phoenix, Phoenix, AZ, ²Columbia University, New York, NY

OP-Sat-2-19

Room A408

Track: Undergraduate Research & Design

Undergraduate Research & Design II

Chairs: Casey Ankeny, Sarah Rooney

1:30 pm–1:39 pm

Respiration Rate Variability Correlates with Mechanical Sensitivity in a Mouse Model of Inflammatory Pain

James Jordano¹, Heidi Kloefkorn¹, William Goolsby¹, Karmarcha Martin¹, and Shawn Hochman¹
¹Emory University, Atlanta, GA

1:39 pm–1:48 pm

Defining Epileptogenic Networks: Contribution of High Frequency Oscillations

Than Huynh^{1,2}, Sijin Ren², Jared Scott², Dakota Crisp², Stephen Gliske², and William Stacey²
¹University of Illinois at Urbana-Champaign, Urbana, IL, ²University of Michigan, Ann Arbor, MI

1:48 pm–1:57 pm

Differences in Primary Schwann Cells Based on Rat Strains

Sean Sullivan¹, Matthew Becker¹, Rebecca Willits¹, and Carlisle Dejulus¹
¹The University of Akron, Akron, OH

1:57 pm–2:06 pm

A Photoresponsive Hyaluronan Hydrogel for Brain Tissue Macrophage Immunomodulation

Renee-Tyler Tan Morales¹, Haoyu Wang¹, Xin Cui¹, Joya Debi¹, Manan Shukla¹, and Weiqiang Chen¹
¹New York University, Brooklyn, NY

2:06 pm–2:15 pm

Effect of Local Demyelination in the Corpus Callosum on mTBI Mechanism

Zachary Lopez¹, Cassandra Gologorsky², Javid Abderezaei¹, Gloria Fabris¹, and Mehmet Kurt^{1,3}
¹Stevens Institute of Technology, HOBOKEN, NJ, ²Cornell University, Ithaca, NJ, ³Translational and Molecular Imaging Institute (TMII), New York City, NY

2:15 pm–2:24 pm

Comparing A Simple Threshold Vs Generalized Linear Model For Interictal Spike Detection

Anil Palepu¹, William Anderson², and Sridevi Sarma¹
¹Johns Hopkins University, Baltimore, MD, ²Johns Hopkins Medical Institute, Baltimore, MD

2:24 pm–2:33 pm

Secretome from Electrically Stimulated Cells Increases Neurite Outgrowth and Angiogenesis *In Vitro*

Aria Henderson¹, Nicole Bohmann¹, Erin Patrick¹, Christine Schmidt¹, and Sahba Mobini¹
¹University of Florida, Gainesville, FL

2:33 pm–2:42 pm

Linking Resting-State Brain Dynamics To Behavior

Chantelle Lim¹, Jeremy Casorso², Dimitri Van De Ville^{2,3}, and Raphaël Liégeois^{2,3}
¹University of Rochester, Rochester, NY, ²Ecole Polytechnique Fédérale de Lausanne, Lausanne, Switzerland, ³University of Geneva, Geneva, Switzerland

2:42 pm–2:51 pm

Proof of Concept: Upper Extremity Sensor System for Robotics-based Stroke Rehabilitation Gym

Sheila Saberry¹, Kevin Bui², and Michelle J. Johnson²
¹Community College of Philadelphia, Philadelphia, PA, ²University of Pennsylvania, Philadelphia, PA

2:51 pm–3:00 pm

Diagnosis of Porcine Burns using Terahertz Spectroscopy *In Vivo*

Timothy Jack Tan¹ and M. Hassan Arbab¹
¹Stony Brook University, Stony Brook, NY

OP-Sat-3-1

Room A311

Track: Cancer Technologies, Drug Delivery & Intelligent Systems

Cancer Drug Delivery II

Chairs: Stavroula Sofou, Daniel Conway

3:15 pm–3:30 pm

Mechanisms of Enhanced Drug Delivery in Brain Metastases with Focused Ultrasound-induced Transient Blood-tumor Barrier Disruption

Yutong Guo¹, Costas D. Arvanitis¹, Vasileios Askoxylakis², Meenal Datta^{2,3}, Jonas Kloepper⁴, Gino K. Ferraro², Miguel O. Bernabeu⁵, Dai Fukumura², Nathan McDannold², and Rakesh K. Jain²

¹Georgia Institute of Technology, Atlanta, GA, ²Massachusetts General Hospital, Harvard Medical School, Boston, MA, ³Tufts University, Medford, MA, ⁴Centre Hospitalier Universitaire Vaudois, Lausanne, Switzerland, ⁵University of Edinburgh, Edinburgh, United Kingdom

3:30 pm–3:45 pm

Augmented Brain-Penetrating Nanoparticle-Mediated Non-Viral Transfection of Brain Tumors via Pre-Treatment with Pulsed Focused Ultrasound

Colleen Curley¹, Brian Mead¹, Namho Kim², Karina Negron², Ji Song¹, G. Wilson Miller¹, William Garrison¹, Alexander Klibanov¹, Jung Soo Suk², Justin Hanes², and Richard Price¹

¹University of Virginia, Charlottesville, VA, ²Johns Hopkins University, Baltimore, MD

3:45 pm–4:00 pm

Examining the Genetic Effects of Combinatorial Radiation Therapy and Immune Modulator Treatments

Kayla Duval¹, Robert Wagner¹, and P. Jack Hoopes¹
¹Dartmouth College, Hanover, NH

4:00 pm–4:15 pm

Infiltrating the Blood-Tumor-Barrier Using Nanochain Particles

Gil Covarrubias¹, Vindya Perera¹, Anthony Cha¹, Morgan Lorkowski¹, Pubudu Peiris¹, and Efstathios Karathansis¹

¹Case Western Reserve University, Cleveland, OH

4:15 pm–4:30 pm

Non-Viral Genetic Reprogramming of Tumor Cells for Self-Directed Cancer Immunotherapy

David Wilson¹, Randall Meyer¹, Stephany Tzeng¹, and Jordan Green¹

¹Johns Hopkins University, Baltimore, MD

OP-Sat-3-2

Room A410

Track: Cancer Technologies

Tumor Microenvironment

Chairs: Esther Gomez, Daniel Conway

3:15 pm–3:30 pm

Ovarian Cancer Cells Direct Macrophage Differentiation and Polarization to a Pro-tumorigenic Phenotype Through Non-canonical Pathways

Kaitlin Fogg¹, Andrew Miller¹, Ying Li¹, Christina Kendzioriski¹, and Pamela Kreeger¹

¹University of Wisconsin–Madison, Madison, WI

3:30 pm–3:45 pm

Understanding Mitochondrial Heterogeneity in Micro-Patterned Tumor Models

Hydari Masuma Begum¹, Kristen Nemes¹, Yuta Ando¹, and Keyue Shen¹

¹University of Southern California, Los Angeles, CA

3:45 pm–4:00 pm

Engineered 3D Tumor Models to Study Natural Killer Cell Suppression

Madison Temples¹, Isaac M Adjei¹, Julie Djeu², and Blanka Sharma¹

¹University of Florida, Gainesville, FL, ²Moffitt Cancer Center, Tampa, FL

4:00 pm–4:15 pm

Exploring the Cross-Talk Between Macrophages and Tumor Cells

Jessica Widman¹, Viktoriya Rybalko¹, Shane Allen¹, and Laura Suggs¹

¹The University of Texas at Austin, Austin, TX

4:15 pm–4:30 pm

Tumor Cell Recruitment is Enhanced Following Radiation-Induced Changes in Cytokine Secretion

Steven Alves¹, Benjamin Hacker¹, Edward Graves², and Marjan Rafat¹

¹Vanderbilt University, Nashville, TN, ²Stanford University, Stanford, CA

4:30 pm–4:45 pm

An Organotypic "Leukemia-on-a-Chip" Platform for Interrogating the Leukemia-Bone Marrow Interactions

Chao Ma¹ and Weiqiang Chen¹

¹New York University Tandon School of Engineering, New York, NY

OP-Sat-3-3

Room A315

Track: Biomedical Imaging and Instrumentation

MRI II

Chairs: Xiaoping Hu, Joan Greve

3:15 pm–3:30 pm

A Standardized Exercise Protocol for Characterizing Skeletal Muscle Metabolism Using ³¹P MRS

INVITED

Candace Fleischer^{1,2}, Moriah Bellissimo¹, Lei Zhou¹, David Reiter¹, Greg Wells³, Thomas Ziegler¹, and Jessica Alvarez¹

¹Emory University School of Medicine, Atlanta, GA, ²Emory University and Georgia Tech, Atlanta, GA, ³The Hospital for Sick Children, Toronto, Canada

3:30 pm–3:45 pm

Hierarchical Clustering of Quantitative MRI Data to Spatially Resolve Heterogeneity of Treatment Response in a Murine Model of HER2+ Breast Cancer

Anum Syed¹, Jennifer Whisenant², Anna Sorace¹, and Thomas Yankeelov¹

¹University of Texas at Austin, Austin, TX, ²Vanderbilt University, Nashville, TN

3:45 pm–4:00 pm

Building/Testing of the 64-channel RF Head Coil Modules for Ultra-High Field Human MRI Applications

Minseok Koo¹, Tales Santini¹, Neilesh Vinjamuri¹, Sossena Wood¹, Nadim Farhat¹, Tiago Martins¹, Salem Alkhateeb¹, and Tamer Ibrahim¹

¹University of Pittsburgh, Pittsburgh, PA

4:00 pm–4:15 pm

Simultaneous Multislice MRI Temperature Imaging with a Single Receive Coil

Kristin Quah¹, Megan Poorman¹, and William Grissom¹
¹Vanderbilt University, Nashville, TN

4:15 pm–4:30 pm

Fusion of Image and Clinical Markers for Renal Transplant Rejection Assessment: A Pilot Study

Mohamed Shehata¹, Mohammed Ghazal^{1,2}, Garth Beache¹, Mohamed Abou El-Ghar³, Amy Dwyer¹, Ashraf Khalil², Adel Elmaghraby¹, and Ayman El-Baz¹
¹University of Louisville, Louisville, KY, ²Abu Dhabi University, Abu Dhabi, United Arab Emirates, ³Mansoura University, Mansoura, Egypt

4:30 pm–4:45 pm

Acousto-optical Sensor with Optical Fiber Connection for Magnetic Resonance Imaging with Improved Safety

Yusuf Yaras¹, Robert Lederman², Ozgur Kocaturk³, and Levent Degertekin¹
¹Georgia Institute of Technology, Atlanta, GA, ²National Heart Lung and Blood Institute, Bethesda, MD, ³Bogazici University, Istanbul, Turkey

OP-Sat-3-4

Room A316

Track: Biomedical Imaging and Instrumentation

Detection, Therapy and Monitoring

Chairs: Carolyn Bayer, Kyle Quinn

3:15 pm–3:30 pm

Deep Learning Based Framework for Early Detection of Acute Renal Transplant Rejection

Hisham Abdeltawab¹, Mohamed Shehata¹, Ahmed Shalaby¹, Samineh Mesbah¹, Maryam Elbaz¹, Mohamed Ghazal¹, Yasmina Alkhalil², Mohamed Abou-Elghar³, Amy Dwyer¹, Mousen El-Melegy⁴, and Ayman Elbaz¹
¹University of Louisville, Louisville, KY, ²Abu Dhabi University, Abu Dhabi, United Arab Emirates, ³University of Mansoura, Mansoura, Egypt, ⁴Assiut University, Assiut, Egypt

3:30 pm–3:45 pm

Tomographic Photoacoustic/Fluorescence Imaging of an Environment-Responsive Multimodal Contrast Agent

Diego Dumani¹, Hans-Peter Brecht², Vassili Ivanov², Justin Harris³, Kimberly Homan³, Jason Cook³, Sergey Ermilov², and Stanislav Emelianov¹
¹Georgia Institute of Technology & Emory University, Atlanta, GA, ²PhotoSound Technologies, Inc., Houston, TX, ³NanoHybrids, Inc., Austin, TX

3:45 pm–4:00 pm

A Semiautomatic Segmentation Method for the Prostate in Magnetic Resonance Images Using Local Texture Classification and Statistical Shape Modeling

Maysam Shahedi¹, Martin Halicek², Lizhi Liu³, Zhenfeng Zhang³, David Schuster⁴, and Baowei Fei^{1,2,4,5}
¹University of Texas at Dallas, Richardson, TX, ²Emory University and Georgia Institute of Technology, Atlanta, GA, ³Sun Yat-sen University Cancer Center, Guangzhou, China, ⁴People's Republic of, ⁵Emory University, Atlanta, GA, ⁵University of Texas Southwest Medical Center, Dallas, TX

4:00 pm–4:15 pm

Ex Vivo Vibrational Photoacoustic Tomography Characterization of Murine Atherosclerosis

Gurmeet Sangha¹ and Craig Goergen¹
¹Purdue University, West Lafayette, IN

4:15 pm–4:30 pm

Combining Visible-Light Optical Coherence Tomography and Microelectrode Measurements of Retinal Metabolism in Rat

Lisa Beckmann¹, Andrey Dmitriev¹, Xian Zhang¹, Brian Soetikno^{1,2}, Robert Linsenmeier^{1,2}, and Hao Zhang^{1,2}
¹Northwestern University, Evanston, IL, ²Northwestern University, Chicago, IL

4:30 pm–4:45 pm

Longitudinal Assessment of Spinal Cord Injury Using DTI and qMT

Tung-Lin Wu¹, Feng Wang¹, Arabinda Mishra¹, George Wilson¹, Nellie Byun¹, Li Min Chen¹, and John Gore¹
¹Vanderbilt University Institute of Imaging Science, Nashville, TN

OP-Sat-3-5

Room A302

Track: Tissue Engineering

Immunoengineering and Immunomodulation in Tissue Engineering

Chairs: Greg Gszeto, Wendy Liu

3:15 pm–3:30 pm

Bone Regeneration in a Critical-Sized Calvarial Defect is Potentiated by Macrophage-Mediated Release of BMP2

Ramkumar T. Annamalai¹, Paul Turner¹, Benjamin Levi², Steven Kunkel², and Jan Stegemann²
¹University of Michigan, Ann Arbor, MI, ²University of Michigan, ANN ARBOR, MI

3:30 pm–3:45 pm

Inducing Tolerance in the Transplant Niche Through Localized Cytokine Delivery

Derfogail Delcassian¹, Raul Elgueta Rebolledo², Carla Ortiz², Omar Qutachi³, Molly Stevens⁴, Giovanna Lombardi², and Kevin Shakesheff¹
¹MIT/University of Nottingham, Cambridge, MA, ²MRC Centre for Transplantation, London, United Kingdom, ³University of Nottingham, Nottingham, United Kingdom, ⁴Imperial College London, London, United Kingdom

3:45 pm–4:00 pm

In Vivo Tissue Engineered Diagnostic Sites for Autoimmune Disease Prognosis

Aaron Morris¹, Robert Oakes¹, Kevin Hughes¹, and Lonnie Shea¹
¹University of Michigan, Ann Arbor, MI

4:00 pm–4:15 pm

Immunoisolating Poly(ethylene glycol) Capsules Support Ovarian Tissue Development to Restore Reproductive Endocrine Function in Mice

James Day¹, Anu David¹, Nikola Milasinovic¹, Marilia Cascalho¹, and Ariella Shikanov¹
¹University of Michigan, Ann Arbor, MI

4:15 pm–4:30 pm

Repeated Treatment with Decellularized Matrices Increase Th1/Th17 Polarization

Kegan Sowers¹, Tri Nguyen¹, Jefferson Overlin¹, and Rene Olivares-Navarrete¹
¹Virginia Commonwealth University, Richmond, VA

4:30 pm–4:45 pm

Iron-oxide Nanoparticles Promote the Bactericidal Activity of Macrophages

Bing Yu¹, Zhongxia Wang¹, and Min-Ho Kim¹
¹Kent State University, Kent, OH

OP-Sat-3-6

Room A305

Track: Device Technologies and Biomedical Robotics, Biomedical Imaging and Instrumentation

Advances in Sensing and Imaging Technology

Chair: Jessica Ramella-Roman

3:15 pm–3:30 pm

Combining Silicon Photonics and Machine Learning for the Phenotypic Profiling of Cells

Alexander Wende¹, Pakapreud Khumwan¹, and Daniel Ratner¹
¹University of Washington, Seattle, WA

3:30 pm–3:45 pm

Deep Learning Bridges the Gap Between Mobile and Laboratory Grade Microscopes

Yair Rivenson¹, Hatice Ceylan Koydemir¹, Hongda Wang¹, Zhenson Wei¹, Zhengshuang Ren¹, Harun Gunaydin¹, Yibo Zhang¹, Zoltan Gorocs¹, Kyle Liang¹, Derek Tseng¹, and Aydogan Ozcan¹
¹University of California Los Angeles, Los Angeles, CA

3:45 pm–4:00 pm

First Portable, Low Cost Mueller Matrix Microscope

Mariacarla Gonzalez¹ and Jessica Ramella-Roman¹
¹Florida International University, Miami, FL

4:00 pm–4:15 pm

Label-Free and High-Throughput Detection of Motile Parasites from Bodily Fluids Using Time-Resolved Speckle Imaging

Yibo Zhang¹, Hatice Koydemir¹, Michelle Shimogawa¹, Sener Yalcin¹, Kent Hill¹, and Aydogan Ozcan¹
¹University of California, Los Angeles, Los Angeles, CA

4:15 pm–4:30 pm

Surface Enhanced Raman Spectroscopy (SERS) Based Assay to Detect Cardiac Troponin I

Javier Garza^{1,2}, Dandan Tu¹, and Gerard Cote^{1,2}
¹Texas A&M University, College Station, TX, ²Center for Remote Health Technologies & Systems, College Station, TX

4:30 pm–4:45 pm

Vibrating Tube Sensors in Biomedical Engineering

William Grover¹
¹University of California, Riverside, Riverside, CA

OP-Sat-3-7

Room A401

Track: Cardiovascular Engineering

Cardiovascular Electrophysiology

Chair: Seth Weinberg

3:15 pm–3:30 pm

Prokaryotic Sodium Channels as Novel Therapy for Excitable Tissue Disorders

Hung Nguyen¹, Hengtao Zhang¹, and Nenad Bursac¹
¹Duke University, Durham, NC

3:30 pm–3:45 pm

Controlling Cardiac Alternans in a Voltage-Calcium Coupling Model

Xiaopeng Zhao¹, Yohannes Shiferaw², and Elena Tolkacheva³
¹University of Tennessee, Knoxville, TN, ²California State University, Northridge, CA, ³University of Minnesota, Minneapolis, TN

3:45 pm–4:00 pm

Intercellular Sodium Nanodomain Signaling Regulates Repolarization in Cardiac Tissue

Madison B. Nowak¹, Seth H. Weinberg¹, and Steven Poelzing²
¹Virginia Commonwealth University, Richmond, VA, ²Virginia Polytechnic University, Roanoke, VA

4:00 pm–4:15 pm

Panoramic Optical Mapping Study of Action Potential Duration Restitution and Alternans in Rabbit Heart.

N. Rokhaya Faye¹, Kedar Aras¹, Shubham Gupta¹, Christopher Gloschat¹, and Igor R. Efimov¹
¹Georges Washington University, Washington, DC

4:15 pm–4:30 pm

Development of *In Vitro* Models for Human Cardiac Arrhythmias

Kareem LK Coulombe¹, Tae Yun Kim², Travis R Wallace¹, Fabiola Munarin¹, Celinda M Kofron¹, Cassidy E Rupert¹, Michelle E. King², Ulrike Mende², and Bum-Rak Choi²
¹Brown University, Providence, RI, ²Rhode Island Hospital, Providence, RI

4:30 pm–4:45 pm

R-Wave Amplitude Alternans (RWAA) a Potential Indicator of Depolarization Alternans in ECGs

Sahar Alaei¹, Siqi Wang¹, Paul Anaya¹, and Abhijit Patwardhan¹
¹University of Kentucky, Lexington, KY

OP-Sat-3-8

Room A404

Track: Cellular and Molecular Bioengineering, Nano and Micro Technologies

Micro/Nano Tools in Molecular Biology

Chairs: Steven Jay, Silviya Zustiak

3:15 pm–3:30 pm

A Synthetic Transfer-messenger RNA Platform for Elucidation of Programmed Changes to Bacterial mRNA Stability Upon Antimicrobial Challenge

Randi Turner¹ and Daniel Dwyer¹
¹University of Maryland, College Park, College Park, MD

3:30 pm–3:45 pm

A Fluorescence Based Microplate Assay for Quantification of Denatured Collagen

Allen Lin¹, Jared Zitnay¹, Yang Li¹, S. Michael Yu¹, and Jeffrey Weiss¹
¹University of Utah, Salt Lake City, UT

3:45 pm–4:00 pm

A Self-Deleting AAV-CRISPR System For *In Vivo* Genome Editing

Ang Li¹, Ciaran Lee¹, Ayrea Hurley², Karol Balderrama², Kelsey Jarrett², Alexandria Doerfler², Marco De Giorgi², Harshavardhan Deshmukh¹, Anirban Ray¹, Gang Bao¹, and William Lagor²
¹Rice University, Houston, TX, ²Baylor College of Medicine, Houston, TX

4:00 pm–4:15 pm

RNA-Sequencing to Evaluate Regenerative Potential of Two-Dimensional Nanomaterials

James Carrow¹, Lauren Cross¹, Robert Reese¹, Manish Jaiswal¹, Carl Gregory¹, Roland Kaunas¹, Irtisha Singh², and Akhilesh Gaharwar¹
¹Texas A&M University, College Station, TX, ²Cornell University, New York, NY

4:15 pm–4:30 pm

Electronic Control of Gene Expression by a CRISPR-Cas9 Transcriptional Regulator

Eric VanArsdale¹, Narendranath Bhokisham¹, and William Bentley¹
¹University of Maryland, College Park, MD

4:30 pm–4:45 pm

Ultrafast Microfluidic Cell Compression for Cell Volume Exchange and Intracellular Macromolecule Delivery

Anna Liu¹, Muhymin Islam¹, Nicholas Stone¹, Vikram Varadarajan², Jenny Jeong¹, Samuel Bowie¹, Peng Qiu¹, Edmund K. Waller³, Alexander Alexeev¹, and Todd Sulchek¹
¹Georgia Institute of Technology, Atlanta, GA, ²Georgia Institute of Technology, Atlanta, GA, ³Emory University, Atlanta, GA

OP-Sat-3-9

Room A405

Track: Nano and Micro Technologies

Nanotechnologies for Global Health and Infectious Diseases

Chairs: Jacqueline Linnes, J-C Chiao

3:15 pm–3:30 pm

Ultrasensitive Naked-Eye Detection of Viral Diseases with Nanoplasmonic Fano Sensors

Xiangchao (Jude) Zhu¹, Mustafa Mutlu¹, Jose Fuentes¹, and Ahmet Yanik¹
¹University of California, Santa Cruz, Santa Cruz, CA

3:30 pm–3:45 pm

Digital Resolution of Particle Attachment for the Development of a Point-of-Care HIV Viral Load Monitoring Platform

Kenneth Long¹, Nantao Li¹, Miguel Aguirre², Congnyu Che¹, and Brian Cunningham¹
¹University of Illinois at Urbana-Champaign, Urbana, IL, ²University of Alicante, Alicante, Spain

3:45 pm–4:00 pm

A Smartphone-assisted Microfluidic Assay for Measuring CD64 Expression on Neutrophils in Suspected Sepsis-positive Patients

Tanmay Ghonge¹, Hatice Ceylan Koydemir², Enrique Valera¹, Jacob Berger¹, Anurup Ganguli¹, Gregory Damhorst¹, Aydogan Ozcan², and Rashid Bashir¹
¹University of Illinois at Urbana Champaign, Urbana, IL, ²University of California, Los Angeles, Los Angeles, CA

4:00 pm–4:15 pm

Electrical Detection of Glycan Biomarkers for Point-of-Care Diagnosis of Tuberculosis

Aniruddh Sarkar^{1,2}, Lenette Lu¹, Jongyoon Han², and Galit Alter¹
¹Ragon Institute of MGH, MIT and Harvard, Cambridge, MA, ²Massachusetts Institute of Technology, Cambridge, MA

4:15 pm–4:30 pm

Engineering a Nanoparticle-based Breath Test for Rapid Detection of Respiratory Infection and Pathogen Classification

Leslie Chan¹, Melodi Anahtar¹, Ta-Hsuan Ong², Kesley Hern¹, Roderick Kunz², and Sangeeta Bhatia¹
¹Massachusetts Institute of Technology, Cambridge, MA, ²MIT Lincoln Laboratory, Lexington, MA

4:30 pm–4:45 pm

Microneedle Delivery of Near Infrared Microparticles for On-patient Medical Record Keeping

Kevin McHugh¹, Lihong Jing^{1,2}, Sean Severt¹, Surangi Jayawardena^{1,3}, Collin Perkinson¹, Sviatlana Rose¹, Robert Langer¹, and Ana Jaklenec¹
¹Massachusetts Institute of Technology, Cambridge, MA, ²Chinese Academy of Sciences, Beijing, China, People's Republic of, ³University of Alabama in Huntsville, Huntsville, AL

OP-Sat-3-10

Room A407

Track: Drug Delivery & Intelligent Systems, Biomaterials

Drug Delivering Biomaterials

Chairs: Michael Gower, Li Tang

3:15 pm–3:45 pm

Combined IL-10 and Resolvin D1 Delivery for Engineered Hydrogels Induces the Differentiation of Tolerogenic Mononuclear Phagocytes Subsets

Ed Botchwey^{1,2}
¹Georgia Institute of Technology, Atlanta, GA, ²Emory University, Atlanta, GA

INVITED

3:45 pm–4:00 pm

Injectable Microspheres for Sustained Release of Platelet-Rich Plasma to Treat Osteoarthritis

Miran Choi¹, Alexandra Blanco¹, Era Jain¹, Saahil Sheath¹, Scott Sell¹, and Silviya Zustiak¹
¹Saint Louis University, Saint Louis, MO

4:00 pm–4:15 pm

Ultrasound-triggered Release Reveals Optimal Timing of CpG Delivery from a Cryogel Cancer Vaccine

Hua Wang¹, Ting-Yu Shih^{1,2}, Alexandra Bartlett¹, Alexander Najibi^{1,2}, Aileen Li^{1,2}, and David Mooney^{1,2}
¹Harvard University, Cambridge, MA, ²Wyss Institute for Biologically Inspired Engineering at Harvard University, Boston, MA

4:15 pm–4:30 pm

Nitric Oxide-Delivering Nanoparticles for the Modulation of Lymphatic Function

Lauren Sestito^{1,2}, Alex Schudel¹, Kim To¹, Brandon Dixon¹, and Susan Thomas^{1,2,3}
¹Georgia Institute of Technology, Atlanta, GA, ²Emory University, Atlanta, GA, ³Winship Cancer Institute, Atlanta, GA

4:30 pm–4:45 pm

Enhancing Cancer Immunotherapy Using Responsive Biomaterials

Li Tang¹
¹École polytechnique fédérale de Lausanne (EPFL), Lausanne, Switzerland

OP-Sat-3-11

Room A303

Track: Neural Engineering, Nano and Micro Technologies

Micro/Nano Tools in Neural Engineering

Chairs: Erkin Seker, Mark Cheng

3:15 pm–3:30 pm

Sensitive and Selective Polymer Nanocomposite for Resting-Level Dopamine Detection at Carbon Fiber Microelectrodes

Noah Freedman¹
¹University of Pittsburgh, Pittsburgh, PA

3:30 pm–3:45 pm

Soft Transparent Graphene Contact Lens Electrode for Conformal Recording of Electroretinogram

Rongkang Yin¹, Zheng Xu¹, and Xiaojie Duan¹
¹Peking University, Beijing, China, People's Republic of

3:45 pm–4:00 pm

Stretchable Transparent Electrode Arrays for Neural Optoelectrical Interfacing

Jing Zhang¹, Xiaojun Liu¹, Fangbing Chu¹, and Xiaojie Duan¹
¹Peking university, Beijing, China, People's Republic of

4:00 pm–4:15 pm

Amorphous Silicon Carbide-based Ultramicroelectrodes for Recording Neural Activity from Peripheral Nerves

Atefeh Ghazavi¹, Jimin Maeng¹, Alexandra Joshi-Imre², Michael Black¹, and Stuart Cogan¹
¹University of Texas at Dallas, Richardson, TX, ²University of Texas at Dallas, Richardson, TX

4:15 pm–4:30 pm

Minimally Invasive Drug Delivery to Brain Microregions

Khalil B. Ramadi^{1,2} and Michael J. Cima^{1,2}
¹Massachusetts Institute of Technology, Cambridge, MA, ²Koch Institute for Integrative Cancer Research, Cambridge, MA

4:30 pm–4:45 pm

Characterizing Electrodermal Activity Using Point Processes in Young Children

Sandya Subramanian¹, Riccardo Barbieri^{1,2,3}, Kristina Johnson¹, and Emery Brown^{1,2,4}
¹Massachusetts Institute of Technology, Cambridge, MA, ²Massachusetts General Hospital, Boston, MA, ³Politecnico di Milano, Milan, Italy, ⁴Picower Institute for Learning and Memory, Cambridge, MA

OP-Sat-3-12

Room A304

Track: Bioinformatics, Computational and Systems Biology

Systems Biology of Infectious Disease

Chairs: Xiling Shen, Elsje Pienaar

3:15 pm–3:30 pm

Debugging Parasite Genomes: Comparative Modeling of Human and Mouse Malaria Parasites

Maureen Carey¹, Jennifer Guler¹, and Jason Papin¹
¹University of Virginia, Charlottesville, VA

3:30 pm–3:45 pm

High-throughput Single-cell Profiling of Viral Genotypes and Host Phenotypes During Viral Infection

Sara Keshavjee¹, Phillip Burnham¹, Mridusmita Saikia¹, John S. L. Parker¹, and Iwijn De Vlaminck¹
¹Cornell University, Ithaca, NY

3:45 pm–4:00 pm

An ODE Model of Antibody Complex Formation Against HIV

Melissa Lemke¹, Matthew Worley², Ester Lopez², Amy Chung², and Kelly Arnold¹
¹University of Michigan, Ann Arbor, MI, ²University of Melbourne, Parkville, Australia

4:00 pm–4:15 pm

Discovering Synergistic and Antagonistic Drug Combinations for Treating *Mycobacterium tuberculosis* using INDIGO-MTB

Suraj Jaipalli¹, Shuyi Ma², David Sherman², and Sriram Chandrasekaran¹
¹University of Michigan, Ann Arbor, MI, ²The Center for Infectious Disease Research, Seattle, WA

4:15 pm–4:30 pm

Cell-Size Based Decision-Making of a Viral Gene Circuit

Kathrin Bohn-Wippert¹, Erin Tevonian¹, Yiyang Lu¹, Meng-Yao Huang², Melina Megaridis¹, and Roy Dar^{1,2,3}
¹Department of Bioengineering, University of Illinois at Urbana-Champaign, Urbana, IL, ²Center for Biophysics and Quantitative Biology, University of Illinois at Urbana-Champaign, Urbana, IL, ³Carl R. Woese Institute for Genomic Biology, University of Illinois at Urbana-Champaign, Urbana, IL

4:30 pm–4:45 pm

Quorum Cell Communication Enhances Dynamic Response to Environmental Changes

Eric Chu^{1,2}, Alex Groisman³, and Andre Levchenko²
¹Johns Hopkins University, Baltimore, MD, ²Yale University, New Haven, CT, ³University of California, San Diego, La Jolla, CA

OP-Sat-3-13

Room A314

Track: Tissue Engineering

Printing and Patterning in Tissues

Chairs: Omid Veisoh, Nathaniel Huebsch

3:15 pm–3:30 pm

Regenerative Neurology: In Vivo Neural Tissue Engineering Using Biodegradable Brain Implants

Arrin Brooks¹, Leah Ching¹, Jenna Marsh¹, and Elmer Price¹
¹Marshall University, Huntington, WV

3:30 pm–3:45 pm

Epithelial Tissue Geometry Directs Emergence of Bioelectric Field and Pattern of Growth

Brian Silver¹ and Celeste Nelson¹
¹Princeton University, Princeton, NJ

3:45 pm–4:00 pm

Heat-activated Spatial Patterning of Gene Expression in 3D Engineered Tissues

Daniel Corbett¹, Bagrat Grigoryan², Jordan Miller², and Kelly Stevens¹
¹University of Washington, Seattle, WA, ²Rice University, Houston, TX

4:00 pm–4:15 pm

3D Printed Programmable Release Capsules to Spatially Control Pluripotent Stem Cell Differentiation

Molly Kupfer¹, Xiaoxiao Fan¹, Michael McAlpine¹, and Brenda Ogle¹
¹University of Minnesota- Twin Cities, Minneapolis, MN

4:15 pm–4:30 pm

Controlling Tissue Patterning in Scaffold-free Engineered Tissues

Fatima Syed-Picard^{1,2}, Avik Basu¹, Kristi Rothermund¹, and Lance Davidson^{1,2}
¹University of Pittsburgh, Pittsburgh, PA, ²McGowan Institute for Regenerative Medicine, Pittsburgh, PA

OP-Sat-3-14

Room A313

Track: Biomechanics

Injury Biomechanics II

Chairs: Andrew Kemper, Alok Shah

3:15 pm–3:30 pm

Laboratory Kinematic Comparison from 1024 Impact Tests of an Impact Monitoring Mouthguard Versus Reference

Adam Bartsch¹, Rajiv Dama¹, Sergey Samorezov², Edward Benzel², Vincent Miele³, John Humm⁴, Alok Shah⁴, Michael McCrea⁴, and Brian Stemper⁴

¹Prevent Biometrics, Minneapolis, MN, ²Cleveland Clinic, Cleveland, OH, ³University of Pittsburgh Medical Center, Pittsburgh, PA, ⁴Medical College of Wisconsin & Zablocki VA Medical Center, Milwaukee, WI

3:30 pm–3:45 pm

Relationship Between Head Impact Exposure and Intrinsic Athlete Characteristics among Youth Football players

William Flood¹, Mireille Kelley¹, Derek Jones¹, Liam McNamara¹, Joel Stitzel¹, and Jillian Urban¹

¹Wake Forest University, Winston-Salem, NC

3:45 pm–4:00 pm

Relationship between Impact Velocity and Resulting Head Acceleration during Head Impacts in Youth Football

Eamon Campolettano¹, Ryan Gellner¹, and Steven Rowson¹
¹Virginia Tech, Blacksburg, VA

4:00 pm–4:15 pm

Effect of Age and Strain Rate on the Tensile Material Properties of Human Rib Cortical Bone

Michael Katzenberger¹, Devon Albert¹, and Andrew Kemper¹
¹Virginia Tech, Blacksburg, VA

4:15 pm–4:30 pm

A Comparison of Testing Methods for Fall Protective Headgear Testing

Morteza Seidi¹, Marzieh Hajiaghameh², and Vincent Caccese³
¹Villanova University, Villanova, PA, ²Georgia Tech, Atlanta, GA, ³University of Maine, Orono, ME

OP-Sat-3-15

Room A312

Track: Tissue Engineering, Stem Cell Engineering

Stem Cells in Tissue Engineering II

Chairs: Feng Zhao, Jeannine Coburn

3:15 pm–3:30 pm

Therapeutic Efficacy of Encapsulated Human Mesenchymal Stem Cells on Osteoarthritis

Jay McKinney^{1,2}, Thanh Doan^{1,2}, Lanfang Wang¹, Juline Deppen^{1,3}, Laura Weinstock³, Ananthu Pucha², Levi Wood^{3,4}, Rebecca Levit¹, and Nick Willett^{1,2,3,4}

¹Emory University, Atlanta, GA, ²Atlanta Veteran's Affairs Medical Center, Atlanta, GA, ³Georgia Institute of Technology and Emory University, Atlanta, GA, ⁴Georgia Institute of Technology, Atlanta, GA

3:30 pm–3:45 pm

Developing a 3D Niche Microenvironment to Improve Stem Cell-Derived β -Cell Maturation for Treatment of Type 1 Diabetes

Richard Youngblood¹, Daniel Clough¹, Joshua Sampson¹, and Lonnie Shea¹

¹University of Michigan, Ann Arbor, MI

3:45 pm–4:00 pm

Delayed Delivery of Parathyroid Hormone-Related Protein for Stabilization of Human Mesenchymal Stem Cell Chondrogenesis

Yueh-Hsun Kevin Yang¹, Tsui-Yun Chang¹, and Gilda Barabino¹

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

4:00 pm–4:15 pm

Mineral Nanoparticle Dissociation Influences Mesenchymal Stem Cell Differentiation

Lauren Cross¹, James Carrow¹, Anna Brokesh¹, Madyson Muscarello¹, and Akhilesh Gaharwar¹

¹Texas A&M University, College Station, TX

4:15 pm–4:30 pm

Biomolecular Rate Indicators for Human Mesenchymal Stem Cell Chondrogenesis

Yi Zhong¹, Sruthi Sivakumar¹, Arnold Caplan¹, Jean Welter¹, and Harihara Baskaran²

¹Case Western Reserve University, Cleveland, OH,

²Case Western Reserve University, Cleveland, OH

4:30 pm–4:45 pm

Investigating the Role of Mesenchymal Stem Cells in Promoting Lymphatic Regeneration

Wenkai Jia¹, Zichen Qian¹, Gabrielle Lohrenz¹, Jeremy Goldman¹, and Feng Zhao¹

¹Michigan Technological University, Houghton, MI

OP-Sat-3-16

Room A408

Track: Undergraduate Research & Design

Undergraduate Research & Design III

Chairs: Casey Ankeny, Sarah Rooney

3:15 pm–3:24 pm

Bioengineered Human Skeletal Muscle: Towards a Functional Model of Pompe Disease

Chris Zhou¹, Jason Wang¹, Alastair Khodabakus¹, Priya Kishnani¹, Dwight Koeberl¹, and Nenad Bursac¹

¹Duke University, Durham, NC

3:24 pm–3:33 pm

Changes in Residual Muscle Architecture Following Limb amputation

Samantha Bratcher¹ and Dustin Crouch¹

¹University of Tennessee, Knoxville, TN

3:33 pm–3:42 pm

Effects of Boundary Conditions on the Stress Relaxation of Passively Compressed Skeletal Muscle

Anurag Vaidya¹ and Benjamin Wheatley¹

¹Bucknell University, Lewisburg, PA

3:42 pm–3:51 pm

Injurious Impaction to Articular Cartilage does not Inhibit Biomechanical Outcomes

Riley Larson¹, Margot Farnham¹, David Burris¹, and Christopher Price¹

¹University of Delaware, Newark, DE

3:51 pm–4:00 pm

Osteoclast-Produced Cathepsin K Inhibition Attenuates Bone Resorption in Sickle Cell Mice

Abhiramgopal Akella¹, Jada Selma², Hannah Song³, Manu Platt², and Edward Botchwey²

¹Georgia Institute of Technology, Lilburn, GA, ²Georgia Institute of Technology, Atlanta, GA, ³Georgia Institute of Technology, At, GA

4:00 pm–4:09 pm

Effect of EMS Loading Configuration on Stair Ascent and Descent Biomechanics Using a Kalman Filter and Wearable Inertial Sensors

Lara Weed¹, Christopher Petrillo¹, Lukas Adamowicz¹, and Ryan McGinnis¹

¹University of Vermont, Burlington, VT

4:09 pm–4:18 pm

Automated Image-Guided Pedicle Screw Placement Using a Commercial Self-Localizing Robot

Alexander D. Smith¹, Jacob Chapin¹, Joao P. L. Lopes¹, and Andrew F. Hall¹

¹Saint Louis University, Saint Louis, MO

4:18 pm–4:27 pm

Development of an Optogenetic System for Point-Pacing Cardiomyocytes

Shivani Pandey¹, Geran Kosteci¹, Renjun Zhu¹, Emilia Entcheva², and Leslie Tung¹

¹Johns Hopkins University, Baltimore, MD,

²George Washington University, Washington, DC

4:27 pm–4:36 pm

Enhancing the Formation of Cardiac Microtissues Using Extracellular Matrix

Jacob Gershon¹ and Tracy Hookway¹

¹Binghamton University, Vestal, NY

4:36 pm–4:45 pm

Using Tunable Resistive Pulse Sensing to Identify and Quantify Extracellular Vesicles

Jessica Molina¹, Mohammad Shaver¹, and Joshua Hutcheson¹

¹Florida International University, Miami, FL

4:45 pm–4:54 pm

To Design and Build a Novel Parallel Plate Perfusion Bioreactor

Davin Ateman¹, Maria Rocha¹, Alexandra Lindsay¹, Aneetta Kuriakose¹, Kytai Nguyen¹, Young-Tae Kim¹, and Cheng-Jen Chuong¹

¹Bioengineering Department, University of Texas at Arlington

POSTER SESSION—SATURDAY

ENTRANCE

REGISTRATION

Posters 281-450

448 438 428 418 408 398 388 378 368 356 346 336 326 316 306 296 286
445 435 425 415 405 395 385 375 365 355 345 335 325 315 305 295 285
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Refreshment Breaks

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Track: Undergraduate Research & Design

Bioinformatics, Computational and Systems Biology

SAT-1

Building a Reaction Model for Common γ -chain Cytokines

Adam Weiner¹, Ali Farhat¹, and Aaron Meyer¹
¹University of California, Los Angeles, Los Angeles, CA

SAT-2

Tensor Factorization Maps the Common Gamma Chain Receptor Input-Output Relationships

Adam Weiner¹, Ali Farhat¹, and Aaron Meyer¹
¹UCLA, Los Angeles, CA

SAT-3

Simulating Tumor Growth Via an Agent-Based Model with Cancer Drug Interactions as Facilitated By a Reaction-Diffusion Equation Solver

Alan Lai¹, Kerri-Ann Norton², Chang Gong¹, Samira Jamalian¹, and Aleksander Popel¹
¹Johns Hopkins University, Baltimore, MD, ²Bard College, Annandale-on-Hudson, NY

SAT-4

Artificial Neural Networks for Detection of Cardiac Anomaly from Electrocardiogram

Alexander Frith¹, Josilene Quintana², Joseph Fortunato³, Hung Cao³, and Tadesse Ghirmai³
¹University of Denver, Denver, CO, ²California State University, Stanislaus, Turlock, CA, ³University of Washington, Bothell, Bothell, WA

SAT-5

Investigating Signaling Pathways that Promote EMT in Hypoxic Microenvironment of Pancreatic Cancer

Amaris Jalil¹, Brooke McGirr², and Matthew Lazzara²
¹Shepherd University, Charles Town, WV, ²University of Virginia, Charlottesville, VA

SAT-6

3D Atlas of the Zebrafish Central Nervous System Using Light Sheet Microscopy

Aqsa Malik¹, Yang Liu², Rebecca Ball², Chelsea Gunderson², Riju Balachandran², Edward Kipreos², James Lauderdale², and Peter Kner²
¹Emory University, Fayetteville, GA, ²University of Georgia, Athens, GA

SAT-7

Agent Based Model of Macrophage Contributions to Cardiac Tissue Fibrosis

Ashleigh Hawk¹, Michaela Rikard², and Shayn Peirce-Cottler²
¹Emory University, Atlanta, GA, ²University of Virginia, Charlottesville, VA

SAT-8

Capsular Adaptation Can Reduce Ascites Formation and Increase Liver Lymph Flow

Chanyanuch Nakapakorn¹, Hannah Petrus¹, Katelynn Bruening¹, Patrick Hernandez¹, Bayley Bedford¹, Ranjeet Dongaonkar¹, and Christopher Quick¹
¹Texas A&M University, College Station, TX

SAT-9

Computational Modeling of the CD39/CD73 Immune Pathway

Christopher Lee¹, Inez Lam², and Feilim Mac Gabhann²
¹Carnegie Mellon University, Pittsburgh, PA, ²Johns Hopkins University, Baltimore, MD

SAT-10

A Biochemical Analysis of COPD Sputum Samples for Determination of Predictive Factors

Deepan Islam¹, Siddharth Shenoy², Xiaoxin Wang³, Jane Christholm², Bo Sun², Allia Malinia⁴, Jung Soo Suk², and Enid Neptune⁴
¹Johns Hopkins University, Tampa, FL, ²Center for Nanomedicine, Baltimore, MD, ³Johns Hopkins University, Baltimore, MD, ⁴Johns Hopkins School of Medicine, Baltimore, MD

SAT-11

Optimized *In Situ* Profiling of Transcriptional Heterogeneity in Small-Cell Lung Carcinoma

Dylan Schaff¹, Shambhavi Singh¹, Kwon-Sik Park¹, and Kevin Janes¹
¹University of Virginia, Charlottesville, VA

SAT-12

Machine Learning to Predict Response to SGLT2 Inhibitors in Virtual Patients Populated from a Quantitative Systems Pharmacology Model of Renal Function

Emily Nieves¹ and K Melissa Hallow¹
¹University of Georgia, Athens, GA

SAT-13

Systematic Gene Activity Attenuation via CRISPRi in Synthetic Minimal Bacteria

Eti Sinha^{1,2}, Komal Dani^{1,2}, Ayesha Khan^{1,2}, Tharini Siddappa^{1,2}, Emanuel Vasquez¹, and Yo Suzuki¹
¹J. Craig Venter Institute, La Jolla, CA, ²University of California, San Diego, San Diego, CA

SAT-14

Modeling JNK Pathway Activation During Coxsackievirus B3 Replication in Cardiomyocytes

Gabrielle Muir^{1,2}, Christian Smolko², and Kevin A. Janes²
¹Mount Holyoke College, South Hadley, MA, ²University of Virginia, Charlottesville, VA

SAT-15

The Effects of Artificial Sweeteners on Rat Metabolism

George Ronan¹, Dhanush Haspula¹, and Brian Hoffmann¹
¹Marquette University and Medical College of Wisconsin, Milwaukee, WI

SAT-16

Mathematical Modeling of Membrane Potential and Ion Current Dynamics under Neural Exposure to Amyloid Beta

Haarika Chalasani¹ and Padmanabhan Seshaiyer²
¹University of Pittsburgh, Pittsburgh, PA, ²George Mason University, Fairfax, VA

SAT-17

Gene Regulation by miRNAs and PRC2 in Glioblastoma Multiforme

Isaac Gandara¹, Haridha Shivram², and Vishwanath Iyer²
¹The University of Texas at El Paso, El Paso, TX, ²The University of Texas at Austin, Austin, TX

SAT-18

Acute Effects of Concussion on Cerebral Blood Flow in Frontal Cortex among Adolescent Football Players

Israa N. Wajih¹, Jillian E. Urban¹, Megan Johnston¹, Elizabeth M. Davenport², Beverly M. Snively¹, Youngkyoo Jung¹, Jeongchul Kim¹, Daryl A. Rosenbaum¹, Alexander K. Powers¹, Joel D. Stitzel¹, Joseph A. Maldjian², and Christopher T. Whitlow¹
¹Wake Forest School of Medicine, Winston-Salem, NC, ²University of Texas Southwestern Medical Center, Dallas, TX

SAT-19

Ion Channel Expression Regulation by Sodium and Potassium in Vascular Endothelial Cells

Jessica Zatarain¹, Monica Karas¹, Sana Nasim¹, Sharan Ramaswamy¹, and Nikolaos Tsoukias¹
¹Florida International University, Miami, FL

SAT-20

Analyzing Maternal Metabolic Data to Predict Neonate Autism Spectrum Disorder Risk

Joshua Chuah¹, Kathryn Hollowood², and Juergen Hahn²
¹Stony Brook University, Stony Brook, NY, ²Rensselaer Polytechnic Institute, Troy, NY

SAT-21

Modeling the Cell Mechanochemical Signaling in Collective Cell Migration

Justin Bui¹ and Seth Weinberg²
¹University of California, Berkeley, Berkeley, CA, ²Virginia Commonwealth University, Richmond, VA

SAT-22

Increased Resting Energy Expenditure as a Marker of Anxiety

Karolena Lein^{1,2}, Zacharie Maloney², Keigo Kawaji², and Ali Cinar²
¹Arizona State University, Goodyear, AZ, ²Illinois Institute of Technology, Chicago, IL

SAT-23

Cell-size Based Decision-making of a Viral Gene Circuit

Kathrin Bohn-Wippert^{*1}, Erin Tevonian^{*1}, Yiyang Lu¹, Meng-Yao Huang², Melina Megaridis¹, and Roy Dar^{1,2,3,4}
¹Department of Bioengineering, University of Illinois at Urbana-Champaign, Urbana, IL, ²Center for Biophysics and Quantitative Biology, University of Illinois at Urbana-Champaign, Urbana, IL, ³Carl R. Woese Institute for Genomic Biology, Urbana, IL, ⁴Department of Electrical and Computer Engineering, University of Illinois at Urbana-Champaign, Urbana, IL

SAT-24

Algebraic Model Predicting the Homeostatic Range of Hepatic Sinusoidal Pressure

Lindsay Harris¹, Allison Scott², Anna Gibson², Nooshin Razmdideh³, and Christopher Quick²
¹Texas A&M University, Round Rock, TX, ²Texas A&M University, College Station, TX, ³Texas A&M University, Katy, TX

SAT-25

Deconvoluting the Heterogeneity of Subcellular Cell Protrusion with Variable Lengths

Lucy Woodbury¹, Chuangqi Wang², Hee June Choi², and Kwonmoo Lee²
¹University of Arkansas, Fayetteville, AR, ²Worcester Polytechnic Institute, Worcester, MA

SAT-26

Computational Studies of Novel Inhibitors of Aldolase A via Molecular Dynamic Simulations

Maiya Yu¹, Rui Qi², Brandon Walker², Kevin Dalby², and Pengyu Ren²
¹University of Michigan, Ann Arbor, MI, ²University of Texas at Austin, Austin, TX

SAT-27

Using a Genetically Engineered Population of Yeast to Understand Drug Response

Mark Schwartz¹, Tuc Nguyen², Nina Pregosin², and Heather Fiumera²
¹Saint Louis University, Lake Zurich, IL, ²Binghamton University, Binghamton, NY

SAT-28

Computational Model of Cardiomyocyte Apoptosis to Reconcile Mechanisms of TKI-Induced Cardiotoxicity

Monika Grabowska¹, Bryan Chun¹, and Jeffrey J. Saucerman¹
¹University of Virginia, Charlottesville, VA

SAT-29

FRET Based Biosensors in IBMK Cells to Measure FRET Efficiency in Fluorescent Vinculin Tension Sensing Probes

Nada Boustany¹ and Nickolas Almodovar²
¹Rutgers University, New Brunswick, NJ, ²John Jay College, Far Rockaway, NY

SAT-30

Patient Recognition For Pervasive Monitoring of Patients in the Intensive Care Unit

Natalie Evelev¹, Kumar Rohit Malhotra¹, Anis Davoudi¹, Parisa Rashidi¹, and Azra Bihorac¹
¹University of Florida, Gainesville, FL

SAT-31

Analysis of Actigraphy Data for Classifying Delirium in the ICU

Nicholas Jackson¹, Anis Davoudi², Azra Bihorac³, and Parisa Rashidi²
¹SSTP Program, University of Florida, Gainesville, FL, ²University of Florida, Department of Biomedical Engineering, Gainesville, FL, ³Department of Nephrology, University of Florida, Gainesville, FL

SAT-32

Integrative Analysis of Gene Expression in Smooth Muscle Cells

Nick Garza^{1,2}, Alfredo Lebron³, Fabiana Duarte¹, Michael Guertin¹, Mete Civelek¹, and Warren Anderson¹
¹University of Virginia, Charlottesville, VA, ²Johns Hopkins University, Baltimore, MD, ³University of Puerto Rico, Aguadilla, PR

SAT-33

In Silico Screens for Potential Modulators of Adverse Remodeling During Infarct Healing

Olga Brazhkina^{1,2}, Angela Zeigler¹, Anders Nelson¹, Jeffrey Holmes¹, and Jeffrey Saucerman¹
¹University of Virginia, Charlottesville, VA, ²University of Arkansas, Fayetteville, AR

SAT-34

A Computational Fluid Dynamics Guided Approach for Calculating Hemodynamics In A Sick Cell Transgenic Mouse Model

Oluwasanmi Ariyo¹, Christian Rivera², and Manu Platt²
¹The Pennsylvania State University, University Park, PA, ²Georgia Institute of Technology, Atlanta, GA

SAT-35

Logistic Regression Model for Immunophenotyping the Tumor Microenvironment

Paraag Gupta¹, Arezo Torang¹, and David Klinke¹
¹West Virginia University, Morgantown, WV

SAT-36

Density Dependent Downsampling of CyTOF data

Pierre Fabris¹, Corey Williams², and Eli Zunder²
¹Rensselaer Polytechnic Institute, Troy, NY, ²University of Virginia, Charlottesville, NY

SAT-37

Cancer CellNet: A Computational Tool to Evaluate the Transcriptional Fidelity of Cancer Models

Rachel Gleyzer¹, Bradley Issacs¹, Pavithra Kumar¹, Edroaldo Lumertz De Rocha², Stephanie Cai¹, Kathleen DiNapoli¹, and Patrick Cahan¹
¹Johns Hopkins University School of Medicine, Baltimore, MD, ²Boston Children's Hospital, Harvard Medical School, Boston, MA

SAT-38

Agent Based Model of Intramuscular Fat Infiltration

Ramon Castellanos-Sanchez¹
¹Florida International University, Miami, FL

SAT-39

Early-Stage Sepsis in Pigs as a Basis for Mathematical Modeling

Teresa Chambers¹, David Swigon¹, and Gilles Clermont¹
¹University of Pittsburgh, Pittsburgh, PA

SAT-40

GapSplit: Efficient Uniform Sampling for Non-Convex Constraint-Based Models

Thomas Keaty¹ and Paul Jensen¹
¹University of Illinois at Urbana-Champaign, Champaign, IL

SAT-41

Simulating Microfluidic Blood Flow in Islet Capillary

Zachary Bustamante¹ and Joe Lo¹
¹University of Michigan-Dearborn, Dearborn, MI

SAT-42

Kinetic Monte Carlo Model of Cortical Actin Network Polymerization in MSCs

Zachary Varley¹, Ehsan Ban¹, and Vivek Shenoy¹
¹University of Pennsylvania, Philadelphia, PA

SAT-43

Modeling of CHO Cell Cultures Using a Neural Network

Samuel Cooke¹ and Jordon Gilmore²
¹University of Pittsburgh, Pittsburgh, PA, ²Clemson University, Clemson, SC

Track: Undergraduate Research & Design

Biomaterials

SAT-46

Biomechanical Characterization of Hyaluronic Acid Hydrogels as a Bioink for Spinal Cord Regeneration

Alexander Douglas¹, Emi Kiyotake¹, and Michael Detamore¹
¹The University of Oklahoma, Norman, OK

SAT-47

Optimizing Rapamycin Recrystallization Within PSi Particles for Sustained Delivery Over Time

Andrea Perry¹, Joanna Wang², Qinglin Yang², and Michael Sailor²
¹University of Illinois, Champaign, IL, ²University of California, San Diego, La Jolla, CA

SAT-48

The Design and Fabrication of Layered Neural Constructs to Mimic Cerebral Cortex Function

Angelea Maestas-Olguin¹, Min Kyoung Sun², and Lohitash Karumbaiah²
¹University of New Mexico, Jarales, NM, ²University of Georgia, Athens, GA

SAT-49

Quantification of the Diffusion of Gelatin Nanoparticles from Microneedles to Tissue

Ann Ramirez¹, Yong Wang², and James Coyne²
¹New Jersey Institute of Technology, Newark, NJ, ²Pennsylvania State University, State College, PA

SAT-50

3D Printing Strategies to Control Scaffold Porosity and Peptide Organization

Anne Behre¹, Paula Camacho¹, Hafiz Busari¹, Peter Schwarzenberg¹, Hannah Dailey¹, and Lesley Chow¹
¹Lehigh University, Bethlehem, PA

SAT-51

Cerium Nanoparticles: Effect on Activity of Metabolic Enzymes

Apoorva Mehta¹, William Scammon¹, Kyle Jardim¹, Donald Ashley¹, Brendan Stewart¹, Mikhail Bredikhin¹, Vladimir Ivanov², and Vladimir Reukov¹
¹Clemson University, Clemson, SC, ²Kurnakov Institute of General and Inorganic Chemistry, Russian Academy of Sciences, Leninskii, Moscow, Russian Federation

SAT-52

A Composite Isotropic Silicone Phantom for Mechanical Probing of the Human Brain with Magnetic Resonance Imaging

Asma Shuaibi¹, Stacey Cahoon¹, Nicolas Gallo¹, Keigo Kawaji¹, and John Georgiadis¹
¹Illinois Institute of Technology, Chicago, IL

SAT-53

Development of MicroCT Techniques for Quantifying Thrombus Formation on Cardiovascular Biomaterials

Avi Gupta¹, Deirdre Anderson¹, Evelyn Yim², and Monica Hinds¹
¹Oregon Health & Science University, Portland, OR, ²University of Waterloo, Waterloo, ON, Canada

SAT-54

Reference Probe Microindentation and Impact Testing Analysis of Denture Tooth Lines

Benjamin Twigg¹, Caitlin Cobb¹, Michelle Pham¹, and Donna Ebenstein¹
¹Bucknell University, Lewisburg, PA

SAT-55

Analysis of Post Processed SLA 3D Printed Polymer

Brenda Burke¹, Gavin Carter², Mark Maynes², Vinay Arun³, and Nancy Ruzycski²
¹University of Florida, GAINESVILLE, FL, ²University of Florida, Gainesville, FL, ³Gainesville High School, Gainesville, FL

SAT-56

Characterizing the Drug Loading Interaction Between Myricetin and Cationic Nanoparticles

Brian He¹, Kenneth Sims¹, and Danielle Benoit¹
¹University of Rochester, Rochester, NY

SAT-57

Determination of Smooth Muscle Cell Growth on Reactive Ion Plasma Treated Polyvinyl Alcohol Biomaterials

Carlos Marquez¹, Patrick Journey¹, and Monica Hinds¹
¹Oregon Health & Science University, Portland, OR

SAT-58

Design and Characterization of Pectin Hydrogels for Biomedical Applications

Chih-Hsiang Hu¹, Jenna Alsaleh², Li Tan², and Cheryl Gomillion²
¹Lafayette College, Easton, PA, ²University of Georgia, Athens, GA

SAT-59

Development of a Thermoresponsive Hydrogel for Cellular Studies

Christopher Wu¹, Maria Yanez¹, and Ehsan Jabbarzadeh¹
¹University of South Carolina, Columbia, SC

SAT-60

Development of a Knitted Poly-L-(lactide) Contact Layer for Anti-Bacterial Wound Dressings

Damea Pham¹, Elizabeth Gianino¹, and Jordon Gilmore¹
¹Clemson University, Clemson, SC

SAT-61

Effects of Ionizing Radiation on Bone Marrow-On-Chip

David Frey^{1,2}, Michael Nelson^{1,2}, Delta Ghoshal^{1,2}, and Krishnendu Roy^{1,2}
¹Georgia Institute of Technology, Atlanta, GA, ²Emory University, Atlanta, GA

SAT-62

Topographical, Chemical, and Electrical Optimization of Polyethylene Glycol Diacrylate Hydrogels for Neural Growth

David Hall¹ and Gabriela Romero Uribe¹
¹University of Texas at San Antonio, San Antonio, TX

SAT-63

Lattice Light Sheet Microscopy Imaging of Cell Adhesion Proteins on Transparent Titanium Dioxide Nanotubes

Deanna Diaz¹, Jevin Meyerink², Brandon Scott², Scott Wood², Robert Anderson², and Grant Crawford²
¹University of Kansas, Lawrence, KS, ²South Dakota School of Mines and Technology, Rapid City, SD

SAT-64

Impact of Mixing Technique on Mechanical Properties of PMMA Bone Cement with an Additive

Dylan Marques¹, Erika Cyphert¹, Greg Learn¹, Chao-Yi Lu¹, and Horst von Recum¹
¹Case Western Reserve University, Cleveland, OH

SAT-65

Designing Collagen Mimetic Materials for Studies of Cell Migration

Emily Eastburn¹, Eden Ford², and April Kloxin²
¹Georgia Institute of Technology, Atlanta, GA, ²University of Delaware, Newark, DE

SAT-66

Nanoindentation of Additively Manufactured Ti-6Al-4V Specimens

Emily McCabe¹, Ebrahim Asadi², and Matthew Priddy¹
¹Mississippi State University, Starkville, MS, ²The University of Memphis, Memphis, TN

SAT-67

2D NMR Spectroscopy for Quantifying the Conjugation of a YIGSR Peptide to Hyaluronic Acid Hydrogels

Emily Thomas¹, Emi Kiyotake¹, Susan Nimmo¹, and Michael Detamore¹
¹University of Oklahoma, Norman, OK

SAT-68

Thermo-responsive Degradable PLA-PEG-PLA-diac Based Hydrogels for Use as Short-term Drug Delivery Vehicles

Emily VanHavel¹, Geeya Patel², Jennifer Kang-Mieler², and Emily Dosmar³
¹Rose-Hulman Institute of Technology, Terre Haute, IN, ²Illinois Institute of Technology, Chicago, IL, ³Rose-Hulman Institute of Technology, Terre Haute, IN

SAT-69

Toxicity of Biocompatible 3D Printed Resins in Reproductive Applications

Emily Zaniker¹, Hunter Rogers¹, Luhan Zhou¹, Atsuko Kusuhara¹, Francesca Duncan¹, and Teresa Woodruff¹
¹Northwestern University, Chicago, IL

SAT-70

A Novel Histologic Method for the Analysis of Intra-peritoneal Implants in Lean and Obese Mice

Francisco Zepeda¹, Kaitlyn Sadtler^{1,2}, Corina MacIsaac¹, Robert Langer^{1,2}, and Daniel Anderson^{1,2}
¹David H. Koch Institute for Integrative Cancer Research, Cambridge, MA, ²Boston Children's Hospital, Boston, MA

SAT-71

Characterization of Substrate Effect in Soft Material Nanoindentation

Gari Eberly¹, Jaden Lee¹, and Donna Ebenstein¹
¹Bucknell University, Lewisburg, PA

SAT-72

Combining Collagen and Hydroxyapatite to Create a Porous Scaffold for Use in Bone Transplants

Gowri Viswanathan¹, Frances Su², and Joanna McKittrick²
¹University of Michigan, Ann Arbor, MI, ²UC San Diego, La Jolla, CA

SAT-73

Synthesis and Characterization of Anionic Polymeric Nanoparticles for Biosensing Applications

H.K.H Jocelyn Dang¹, Marissa Wechsler¹, and Nicholas Peppas^{1,2}
¹The University of Texas at Austin, Austin, TX, ²Dell Medical School, Austin, TX

SAT-74

PDMS as a Fibroblast Substrate with Independently Tunable Storage and Loss Moduli

Halston Deal¹, Thomas Petet¹, Patrick Link¹, and Christopher Lemmon¹
¹Virginia Commonwealth University, Richmond, VA

SAT-75

Angiogenic Response to IL-4 Eluting Coatings in Mesh Tissue Explants

Hannah Geisler¹, Alexis Nolfi^{1,2}, Aimon Iftikhar^{1,2}, and Bryan Brown^{1,2}
¹University of Pittsburgh, Pittsburgh, PA, ²McGowan Institute for Regenerative Medicine, Pittsburgh, PA

SAT-76

Poly(ϵ -caprolactone)/Gelatin (PCL/GEL) Nanofibrous Composite Biomaterials Via Green Electrospinning

Hannah Lacy¹ and Andrei Stanishevsky¹
¹University of Alabama at Birmingham, Birmingham, AL

SAT-77

A Novel Chromogenic β -lactamase Substrate for Bacteria Detection

Hannah Safford¹, Dahlia Alkekhia¹, Shashank Shukla¹, and Anita Shukla¹
¹Brown University, Providence, RI

SAT-78

Radial Electrodeposition of Alginate Hydrogels for Creation of Luminal Structures

Jared Capuano¹, David Kingsley¹, and David Corr¹
¹Rensselaer Polytechnic Institute, Troy, NY

SAT-79

Electroconductive Hydrogel Arrays with ECM Protein and NGF for PC-12 Cell Differentiation

Jasper Kim Ocampo¹, Michael Zimmerman¹, Sara Abasi¹, and Anthony Guiseppi-Elie¹
¹Texas A&M University, College Station, TX

SAT-80

Paper-based Liver Organ-on-a-chip for Herbal Drug Toxicity Screening

Jennifer Ngo¹, Katikka Kaarj¹, Christina Loera¹, Patarajarin Akarapipad¹, and Jeong-Yeol Yoon¹
¹University of Arizona, Tucson, AZ

SAT-81

3-D Printability of Electroconductive PEDOT:PSS Incorporated p(HEMA-co-PEGMA) Hydrogels

Jesse F. Phipps^{1,2}, John R. Aggas^{1,2}, and Anthony Guiseppi-Elie^{1,2}
¹Texas A&M University, College Station, TX, ²Center for Bioelectronics, Biosensors & Biochips, College Station, TX

SAT-82

Fabrication of Synthetic Vascular Grafts Using Citrate-Based Fluorescent Polymers

John Tierney¹, Qiyao Li², and Jian Yang²
¹University of South Carolina, Columbia, SC, ²Penn State University, State College, PA

SAT-83

Tumor on a Chip: Developing A Bioprinted Ex Vivo Breast Cancer Tumor Model

Jonathan Adorno^{1,2}, William Hynes², Elizabeth Wheeler², and Monica Moya²
¹Northeastern University, Boston, MA, ²Lawrence Livermore National Laboratory, Livermore, CA

SAT-84

Tailoring Bacterial Cellulose Membranes to Promote Cells Growth Using Directed Plasma Nanosynthesis

Joshua Devorkin¹, Sandra Arias¹, Ana Civantos¹, and Jean Paul Allain¹
¹University of Illinois, Urbana, IL

SAT-85

Effects of Varying Cryoprotectants on Transfection Efficiency and Cell Cytotoxicity of Pgp/pGFP Polyplexes in Rat Glioma (C6) Cells

Joshua Woo^{1,2}, Ki Taek Kim¹, Christian Macks¹, and Jeoung Soo Lee¹
¹Clemson University, Greenville, SC, ²Johns Hopkins University, Baltimore, MD

SAT-86

Nitric Oxide Releasing Antibacterial Biodegradable Temporary Skin Template

Juhi Mancha¹, Jitendra Pant¹, Sean Hopkin¹, and Hitesh Handa¹
¹University of Georgia, Athens, GA

SAT-87

Modulating the Immune System: Micro-Ellipsoidal Tolerogenic Artificial Antigen Presenting Cells for Regulatory T-Cell Induction

Justin Wang^{1,2}, Kelly Rhodes^{1,2}, Randall Meyer^{1,2,3}, Stephany Tzeng^{1,2}, and Jordan Green^{1,2,3,4,5}
¹Johns Hopkins University, Baltimore, MD, ²Translational Tissue Engineering Center, Baltimore, MD, ³Institute for Nanobiotechnology, Baltimore, MD, ⁴John Hopkins University, Baltimore, MD, ⁵Bloomberg-Kimmel Institute for Cancer Immunotherapy, Baltimore, MD

SAT-88

Exploring Material Parameters to Affect Properties of Gelatin Hydrogels Crosslinked with Cellulose Nanowhiskers

Logan Verheyen¹, James Meyer¹, and Marcus Foston¹
¹Washington University in St. Louis, St. Louis, MO

SAT-89

Effect of Glycation Time On Rheological Properties of Collagen Gels

Marcos Rodríguez¹, Nicole Diamantides², and Lawrence Bonassar²
¹UPR-Mayaguez, Mayaguez, PR, ²Cornell University, Ithaca, NY

SAT-90

Optimization of 3D Printed Polymer Stapes Prosthetic

Mark Maynes¹, Gavin Carter¹, Brenda Burke¹, Vinay Arun², and Nancy Ruzycski¹
¹University of Florida, Gainesville, FL, ²Gainesville High School, Gainesville, FL

SAT-91

Electrospinning of GelMA and Evaluation of Fibrochondrocyte Response in GelMA

Matthew Gonsalves¹, Philip Brudnicki¹, Arjun Dayal¹, and Helen Lu¹
¹Columbia University, New York, NY

SAT-92

Charge Switch Membranes for Rapid Isolation of microRNA

Mayuri Singh¹, Rachael Cohen¹, and Stephanie McCalla¹
¹Montana State University, Bozeman, MT

SAT-93

In Vitro Characterization of Mechanical Degradation in Synthetic Therapeutic Mesh Materials for Cardiac Indications

Meghna Jayaraman¹, Michele Tang¹, Jen Koevary¹, Jordan Lancaster¹, and Steven Goldman¹
¹University of Arizona, Tucson, AZ

SAT-94

Towards Cell Encapsulation in DNA Hydrogels

Meihui Zhang^{1,2}
¹University of Tokyo, Tokyo, Japan, ²The Ohio State University, Columbus, OH

SAT-95

Oxygen-generating Polycaprolactone/Calcium Peroxide Microparticles to Support Cell Survival in Hypoxic Environment

Mengen Zhang¹, Tawan Kiratiwongwan¹, and Wei Shen¹
¹University of Minnesota, Minneapolis, MN

SAT-96

Laser Engraving Soft Materials for Tissue Engineering Applications

Michael Dvornik¹, Rachel Besser¹, Renata Maciel¹, Matthew Ishahak¹, Jordan Hill¹, Mario Saporta¹, and Ashutosh Agarwal¹
¹University of Miami, Miami, FL

SAT-97

Influence of Biomaterial Scaffold Properties on Breast Cancer Cell Morphology and Proliferation

Minh-Chau N. Le¹, Zi Wang¹, Kathryn Ellett¹, Bowen Ding¹, and Stephen J. Florczyk¹
¹University of Central Florida, Orlando, FL

SAT-98

Generation of Thermal ECM-Based Hydrogels Derived from Chemically Decellularized Peripheral Nerve

Natalie Vaughn¹, Michaela McCrary¹, Young Hye Song¹, Cameron Morley¹, Thomas Angelini¹, and Christine Schmidt¹
¹University of Florida, Gainesville, FL

SAT-99

Cancer-endothelial Cell Interactions in the Context of Vascular Mimicry

Neal Kewalramani¹, William Leineweber², and Stephanie Fraley²
¹University of Maryland, College Park, MD, ²University of California, San Diego, La Jolla, CA

SAT-100

Histology of Wound Tissue Samples Treated with Electrospun Soy Protein Scaffolds

Neha Devaravar¹, Jonathan Gerstenhaber¹, Yah-el Har-el¹, and Peter Lelkes¹
¹Temple University, Philadelphia, PA

SAT-101

Calpain Nanosensors for Traumatic Brain Injury

Nicholas Mininni¹, Julia Kudryashev², and Ester Kwon²
¹North Carolina State University, Raleigh, NC, ²University of California, San Diego, La Jolla, CA

SAT-102

Supramolecular Guest-Host Double Network Hydrogel for Modulating Cell Spreading and Focal Adhesion Size

Nikolas Di Caprio^{1,2,3}, Claudia Loebel¹, and Jason Burdick^{1,2}
¹University of Pennsylvania, Philadelphia, PA, ²Center for Engineering Mechanobiology, Philadelphia, PA, ³Temple University, Philadelphia, PA

SAT-103

Effect of Orbital Shaking on Rheological Behavior of Regenerated Silk Fibroin Solutions

Paul Kim¹, Rosalyn Abbott¹, and Megan DeBari¹
¹Carnegie Mellon University, Pittsburgh, PA

SAT-104

Impact of Collagen to Polyε-polycaprolactone) Ratio on Crystallinity And Mesh Hemocompatibility

Prerona Dewan¹, Mozghan Shojaee¹, and Chris Bashur¹
¹Florida Institute of Technology, Melbourne, FL

SAT-105

Visible Light Responsive Polymer for Nanoparticle Drug Delivery

Rachel Strons¹, Vincent Tran², and Adah Almutairi²
¹Vanderbilt University, Nashville, TN, ²University of California, San Diego, La Jolla, CA

SAT-106

Novel Horseradish Peroxide (HRP) Crosslinking Strategy for Fibrin Microthreads

Rebecca Mooney¹, Meagan Carnes¹, Jeannine Coburn¹, and George Pins¹
¹Worcester Polytechnic Institute, Worcester, MA

SAT-107

Long Term Biocompatibility of Zinc and Zinc Alloys in a Rat Arterial Model

Roger Guillory¹, Alexander Oliver¹, Elisha Earley¹, Emma Davis¹, and Jeremy Goldman¹
¹Michigan Technological University, Houghton, MI

SAT-108

Development of an Assay to Evaluate Therapeutic Response of Cells in Multiple Culture Models

Roisin Donnelly¹, Kimberly Ornell², and Jeannine Coburn²
¹Trinity College Dublin, Dublin, Ireland, ²Worcester Polytechnic Institute, Worcester, MA

SAT-109

Development of Liver Tissue Phantom Composite for Investigation of Hydrophilic Polymer Coating for Biopsy Needles

Sara Galbraith¹, Thomas Sherlock¹, Christopher Batich¹, and Malisa Sarntinoranont¹
¹University of Florida, Gainesville, FL

SAT-110

Quantitative Validation of Plant-Based Tissue Model Microvasculature to Mimic Healthy and Diseased Myocardium Vasculature

Sarah Schroeder¹, Keigo Kawaji¹, and Marcella Vaicik¹
¹Illinois Institute of Technology, Chicago, IL

SAT-111

Polyelectrolyte Multilayer Films for Controlled Delivery of SHP2 Inhibitor, SHP099

Soobin Wang¹, Dahlia Alkekha¹, Alessia Battigelli¹, Wentian Yang², Douglas Moore², Valentin Antoci², and Anita Shukla¹
¹Brown University, Providence, RI, ²Alpert Medical School, Providence, RI

SAT-112

Self-Assembly of Hyaluronic Acid-Peptide Molecules into Biomimetic Hydrogels

Sydney Yang¹, Lucien Schreiber², Hafiz Busari¹, and Lesley Chow¹
¹Lehigh University, Bethlehem, PA, ²National University of Galway, Galway, Ireland

SAT-113

Modulating Viscoelasticity of Collagen-Lignin Composites for an Engineered 3D Matrix

Syed A. Zamin¹, Joseph C. Penrod², Jorge A. Belgodere¹, Jian Shi³, and Jangwook P. Jung¹
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SAT-114

Cell-Mediated Damage of the Subchondral Plate

Tima Mikdashi¹, Albert Chen², and Robert San²
¹University of Maryland, College Park, MD, ²University of California, San Diego, La Jolla, CA

SAT-115

Combined Methacrylation/fluorination of Gelatin for Tissue Engineering Applications

Tolulope Awosika¹, Marco Santoro¹, and John P. Fisher¹
¹University of Maryland, College Park, MD

SAT-116

Rheological Properties of Methacrylated Hyaluronic Acid-Based Solutions as Bioinks for 3D Bioprinting

Tran Ngo¹, Benjamin Spearman¹, Sahba Mobini¹, and Christine Schmidt¹
¹University of Florida, Gainesville, FL

SAT-117

Cytotoxicity of Polynorbornene Nanoparticles for Targeted Drug Delivery Post Myocardial Infarction

Tyler Dorobek¹, Holly Sullivan¹, Gina Policastro¹, Andrea Carlini², Andrea Luthi³, Nathan Gianneschi², and Karen Christman¹
¹University of California, San Diego, La Jolla, CA, ²Northwestern University, Evanston, IL, ³Emporia State University, Emporia, KS

SAT-118

A Peripheral Nerve Extracellular Matrix Hydrogel Enhances Return to Function After A Sciatic Nerve Gap Injury

Tyler Martin¹, Travis Prest^{1,2}, Lucile Marchal², Clint Skillen², Tyler Meder², and Bryan Brown^{2,3}
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SAT-119

Development and Characterization of a Thermally Responsive Fluorescent Embolic for the Treatment of Juvenile Nasopharyngeal Angiofibroma

Zach Barber¹, M. Martin Jensen¹, Kyle Isaacson¹, Doug Steinhaff¹, Joe Capello¹, Hamid Ghandehari¹, and Jeremiah Alt¹
¹University of Utah, Salt Lake City, UT

SAT-120

Platelet-like Particles Augment Hemostasis Following Traumatic Injury

Colleen Roosa¹, Emily Mihalko¹, Kimberly Nellenbach¹, and Ashley Brown¹
¹North Carolina State University, Raleigh, NC

Track: Undergraduate Research & Design

Biomechanics

SAT-123

Biomechanical Responses During Exercise for Human Spaceflight Applications

Abby Blocker¹, Kaitlin Lostrascio¹, and Stephanie Carey¹
¹University of South Florida, Tampa, FL

SAT-124

Ultrasound for Materials Research: Developing Methods to Quantify Internal Displacements in Soft Material Tissue Phantoms

Alexis Brake¹, Aaron Forster², Sam Smith³, and Edward Allocca⁴
¹University of Florida, Gainesville, FL, ²National Institute of Standards and Technology, Gaithersburg, MD, ³University of Maryland, College Park, MD, ⁴Gaithersburg High School, Gaithersburg, MD

SAT-125

Measuring Upper Extremity Muscle Signals in Able Bodied Individuals

Alison Brecheisen¹, Tess Meier², Christopher Nycz², and Gregory Fischer²
¹Taylor University, Upland, IN, ²Worcester Polytechnic Institute, Worcester, MA

SAT-126

Quantifying Solute Diffusivity in Human Osteoarthritic Cartilage via Correlation Spectroscopy

Alison Wright¹, Brian Graham¹, and Christopher Price¹
¹University of Delaware, Newark, DE

SAT-127

3D Gel Culture Platforms Reveal Differences in Fibroblast Actin Dynamics in a Model of Scar Tissue Development

Alondra Ortiz-Ortiz¹, Daniel Stewart², Natalie Fredette², Holly Ryan², and Chelsey Simmons²
¹University of Puerto Rico Mayaguez Campus, Mayaguez, PR, ²University of Florida, Gainesville, FL

SAT-128

Engineering the Modulus and Hydration of Poly(HEMA)-based Hydrogels

Alycia Sherback¹
¹Texas A&M University, College Station, TX

SAT-129

Investigation of Multiple Strategies in Modeling an Expandable Stent by Finite Element Method

Amy Hill¹ and Hwa Liang Leo²
¹University of Pittsburgh, Pittsburgh, PA, ²National University of Singapore, Singapore, Singapore

SAT-130

Preventing Mechanical Changes in Arteries due to Elastin Degradation

Andre Gutierrez Marty¹ and Jessica Wagenseil²
¹Carnegie Mellon University, Pittsburgh, PA, ²Washington University in St. Louis, St. Louis, MO

SAT-131

DECT-based Quantification of BMAT and an Analysis of Variability within the Lumbar Vertebrae

Angela Kubik^{1,2}, Katelyn Greene², Kyle McNamara^{2,3}, Kristen Beavers⁴, J. Keenan Brown⁵, Leon Lenchik³, Daniel Beavers³, Denise Houston³, and Ashley Weaver²
¹State University of New York at Geneseo, Geneseo, NY, ²Virginia Tech-Wake Forest School of Biomedical Engineering and Sciences, Winston-Salem, NC, ³Wake Forest School of Medicine, Winston-Salem, NC, ⁴Wake Forest University, Winston-Salem, NC, ⁵Mindways Software, Austin, TX

SAT-132

Cruciate Ligament Length Changes During Laxity Style Loading Across Different Specimens

Angelica Torres¹, Neda Abdollahi², and Jason Halloran²
¹University of Puerto Rico, Mayaguez, Puerto Rico, ²Cleveland State University, Cleveland, OH

SAT-133

Characterizing the Deformation of the Finger Pad in Contact with Compliant Objects

Ashley Eberly¹, Steven Hauser², and Gregory Gerling²
¹The University of Alabama, Tuscaloosa, AL, ²University of Virginia, Charlottesville, VA

SAT-134

Effects of Combined Hind Limb Suspension and sRANKL on Bone Strength in Mice by FEA

Benjamin Hezrony¹, Toni Speacht², Henry Donahue³, and Anthony Lau¹
¹The College of New Jersey, Ewing, NJ, ²Penn State College of Medicine, Hershey, PA, ³Virginia Commonwealth University, Richmond, VA

SAT-135

A Biomechanical Study of Fibrosis Reversal by mTORC1 Inhibitors in NHLFs

Benjamin Smith¹, Vincent Moy², and Cathy Swindlehurst³
¹University of Miami, Coral Gables, FL, ²University of Miami Miller School of Medicine, Miami, FL, ³NovoMedix, LLC., San Diego, CA

SAT-136

Biochemical Regulation of Vascular Tone within a 3D In Vitro Model

Brandon DeOre¹ and Peter Galie¹
¹Rowan University, Glassboro, NJ

SAT-137

Analysis of Watersport Helmets Ability to Reduce Head Impact Accelerations

Brock Duma¹, Abigail Tyson¹, Casey Charron¹, and Stefan Duma¹
¹Virginia Tech, Blacksburg, VA

SAT-138

Intact Leg Loading in Simulated Unilateral Transfemoral Amputee Gait

Brooke Hayley¹, Hannah LaVier¹, Mikalah Iverson¹, Anthony Moon¹, Karley Patterson¹, and Ko Sasaki¹
¹LeTourneau University, Longview, TX

SAT-139

Combining Cyclic Stretch and Micro-contact Printing to Study the Mechanical Regulation of Apoptosis

Brooke Hayley¹, Zachary Goldblatt², and Kristen Billiar²
¹LeTourneau University, Longview, TX, ²Worcester Polytechnic Institute, Worcester, MA

SAT-140

Digital Extenders Platform for Augmented Intubation

Carlyn Abbott¹, Andrea Afanador¹, Sarah Robinson¹, Corinne Nawn¹, Ernesto Hernandez¹, Roberto Orrostieta¹, Susana Ortega Contreras¹, Priya Jain¹, and R. Lyle Hood¹
¹University of Texas at San Antonio, San Antonio, TX

SAT-141

Eye Tracking and Virtual Reality—Where Does a Pedestrian Look Before They Cross?

Catherine Krawiec¹, Robert Fralinger², Aditya Belwadi¹, and Seri Park²
¹Children's Hospital of Philadelphia, Philadelphia, PA, ²Villanova University, Villanova, PA

SAT-142

Effects of Sit-Stand Desks on Postural Sway of the Head and Trunk

Chandler Shannon¹ and Anita Vasavada¹
¹Washington State University, Pullman, WA

SAT-143

Oscillating Fluid-flow Modulates β -catenin Accumulation in the Cytosol of Osteocytes

Chris Brunkhorst¹, Otto Juhl IV¹, Yue Zhang¹, and Henry Donahue¹
¹Virginia Commonwealth University, Richmond, VA

SAT-144

Analyzing Right Ventricular Response to LCZ696 In Pulmonary Hypertension

Claire Tushak^{1,2}, Danial Sharifi Kia^{1,2}, Evan Benza², Kang Kim^{1,2}, and Marc Simon^{1,2}
¹University of Pittsburgh, Pittsburgh, PA, ²Heart and Vascular Institute, UPMC, Pittsburgh, PA

SAT-145

Comparing FE and Lumped Parameter Models to Predict The Effects Of Myocardial Infarction

Craig DeClerck¹, Lik Chuan Lee¹, and Jayavel Arumugam¹
¹Michigan State University, East Lansing, MI

SAT-146

Tunable Stiffness Networks to Quantify Barrier Function *In Vitro*

D. Walker Dietrich¹, Daniel C. Stewart¹, Ryosuke Yokosawa¹, and Chelsey S. Simmons¹
¹University of Florida, Gainesville, FL

SAT-147

Decellularizing the Porcine Lamina Cribrosa

Daniela Krahe¹, Katelyn Axman¹, Jean Liou¹, Bryan Brown^{1,2,3}, and Jonathan Vande Geest^{1,2}
¹University of Pittsburgh, Pittsburgh, PA, ²McGowan Institute for Regenerative Medicine, Pittsburgh, PA, ³Clinical and Translational Science Institute, Pittsburgh, PA

SAT-148

Designing and 3D Printing of Mechanically Biomimetic Scaffolds for Tissue Engineering

Darby Ballard¹, Erica Huebner¹, Raghuvver Lalitha Sridhar¹, Andrew Robbins¹, and Michael Moreno¹
¹Texas A&M University, College Station, TX

SAT-149

A Comparison Study of Athletic Kinesio-tapes and Structural Cloth Tapes Applied to Address Biomechanical Injuries and Muscle Stabilization

Declan Shannon¹ and Brian Love¹
¹University of Michigan, Ann Arbor, MI

SAT-150

Computational Prediction of Angiogenesis through Hydroxyapatite Scaffolds

Elysa Jui¹ and Teja Guda¹
¹University of Texas at San Antonio, San Antonio, TX

SAT-151

A Computational Study of the Role of Pericardium on Cardiac Function in Normal and Hypertensive Hearts

Emilio Mendiola¹, Huan Nguyen¹, Reza Avaz¹, and Michael Sacks¹
¹The University of Texas at Austin, Austin, TX

SAT-152

Estimation of Knee Ligament Slack Lengths Considering Registration Error

Emily Clark¹, William Zaylor², and Jason P. Halloran²
¹Trine University, Angola, IN, ²Cleveland State University, Cleveland, OH

SAT-153

Mechanoresponsive Spontaneous Wicking for Lubrication and Fluid Delivery

Emma Northrup¹, Christopher Maiorana¹, and Guy German¹
¹Binghamton University, Binghamton, NY

SAT-154

User Biomechanics of Exoskeleton-Assisted Gait

Erika Kasen¹, Ying Fang², Eric Fabara³, Paolo Bonato³, Nathaniel Smith⁴, and Karen Troy²
¹Trine University, Angola, IN, ²Worcester Polytechnic Institute, Worcester, MA, ³Spaulding Rehabilitation Hospital, Boston, MA, ⁴US Army Research Institute of Environmental Medicine, Natick, MA

SAT-155

Tumor-Agarose Model to Determine Three-Dimensional Gel Deformation Field Induced by Tumor Growth

Gilad Drillich¹, Xiangyu Gong², Rufeng Ma², and Kristen Mills²
¹Rensselaer Polytechnic Institute, Harrington Park, NJ, ²Rensselaer Polytechnic Institute, Troy, NY

SAT-156

Mapping Compressive and Tensile Strains in the Patellar Tendons of Patients with Osgood-Schlatter Disease Using Ultrasound Elastography

Grace Weyand¹, Hannah Goldring¹, Catherine Kuo¹, Michael Richards^{1,2}, Katherine Rizzone¹, and Mark Buckley¹
¹University of Rochester, Rochester, NY, ²Rochester Institute of Technology, Rochester, NY

SAT-157

Traumatic Elbow Injury in a Rat Model Causes Morphological Changes in Bone Microstructure

Grant S. Owen¹, Alex J. Reiter¹, Ryan M. Castile¹, Aaron M. Chamberlain¹, and Spencer P. Lake¹
¹Washington University in St. Louis, St Louis, MO

SAT-158

Mechanical Anisotropy in the Healthy and Pathological Achilles Tendon Assessed Using Shear Wave Elastography

Hannah R. Goldring¹, Kyoung (Crystal) Kim¹, Rifat Ahmed¹, Soumya Goswami¹, Stephen A. McAleavey¹, Zachary Dejager¹, and Mark R. Buckley¹
¹University of Rochester, Rochester, NY

SAT-159

Optimization of a Lung Constitutive Model for Finite Element Analysis Using Human Tissue Data

Harper Stewart^{1,2}, Karan Devane¹, Bharath Koya¹, William Decker¹, Andrew Kemper³, and Scott Gayzik¹
¹Wake Forest University School of Medicine, Winston-Salem, NC,
²Bucknell University, Lewisburg, PA, ³Virginia Polytechnic Institute and State University, Blacksburg, VA

SAT-160

Developing an Improved Material Model for Rib Cortical Bone Used in Human Finite Element Models

Jaafar Al Hadab¹, Keegan Yates², and Costin Untaroiu²
¹University of Rochester, Rochester, NY, ²Virginia Tech, Blacksburg, VA

SAT-161

Mechanics and Cell Response to Aligned Electrospun Nanofibers for Tissue Engineering

Jared Posselt¹, Maura Francis², David Brennan², Vince Beachley², and Christopher Wagner¹
¹The College of New Jersey, Ewing, NJ, ²Rowan University, Glassboro, NJ

SAT-162

Understanding the Relationship Between Force and ACL Rupture During Non-Invasive Knee Injury

Jessica Hornyak¹, Shannon Brown¹, and Blanka Sharma¹
¹University of Florida, Gainesville, FL

SAT-163

Neck Stiffness Influence on Brain Deformations Under Frontal Blunt Impact

John Emmanuel Badiola¹, Michael Hanna¹, Abdus Ali¹, and Bryan Pfister¹
¹New Jersey Institute of Technology, Newark, NJ

SAT-164

CIREN Case Vehicle Reconstruction Using 3D Laser Scanner

Julia Brisbane^{1,2}, James Gaewsky¹, and Joel Stitzel¹
¹Virginia Tech-Wake Forest Center for Injury Biomechanics, Winston-Salem, NC, ²Clemson University, Clemson, SC

SAT-165

Measurement of Incremental Correlation Error in 2D Digital Image Correlation of Knee Meniscus Tissue

Justin Bartell¹, Dawn Elliott², and John Peloquin²
¹Florida State University, Tallahassee, FL, ²University of Delaware, Newark, DE

SAT-166

The Effect of FGF9/FGF18 Gene Deletion on Muscle Force Production in Mice

Kacie Breeding¹, Elahe Ganji², Megan Smith³, and Megan Killian²
¹Biomedical Engineering, Nashville, TN, ²University Of Delaware, Newark, DE, ³University of Pittsburgh, Pittsburgh, PA

SAT-167

Continuous Monitoring of Pelvic Tilt and its Correlation to Adolescent Scoliosis

Kalyn Younger¹ and Kerry Danelson²
¹Johns Hopkins University, Winston Salem, NC, ²Wake Forest School of Medicine, Winston Salem, NC

SAT-168

Neck Injury Risk During Landing for Astronauts with Spaceflight Induced Changes in Muscle Size

Karim Khattab¹, Kyle McNamara^{2,3}, Katelyn Greene^{2,3}, Leon Lenchik³, and Ashley Weaver^{2,3}
¹Louisiana State University, Baton Rouge, LA, ²Virginia Tech, Wake Forest University Center for Injury Biomechanics, Winston-Salem, NC, ³Wake Forest University School of Medicine, Winston-Salem, NC

SAT-169

Gait Kinematics and Muscle Activity from Wearable Sensors Associated with Disability in Persons with Multiple Sclerosis

Kaseya Xia¹, Lukas Adamowicz¹, Lara Weed¹, Caroline Duksta¹, Gianna Barnhart¹, Andrew Solomon¹, and Ryan McGinnis¹
¹University of Vermont, Burlington, VT

SAT-170

Mechanical Behavior of Kinesiology Tape

Kathryn Blessinger¹, Emily Hoke¹, Jacquelin Ramirez¹, Jessa Ward¹, and Renee Rogge¹
¹Rose-Hulman Institute of Technology, Terre Haute, IN

SAT-171

Cell Confinement Induces Nuclear Lamina Wrinkles in Hutchinson-Gilford Progeria Fibroblasts

Katie Tieu¹, Daniel Conway², Kris Dahl³, and Kranthi Bathula⁴
¹Virginia Commonwealth University, Richmond, VA, ²Virginia Commonwealth University, Richmond, VA, ³Carnegie Mellon University, Pittsburgh, PA, ⁴VCU, Richmond, VA

SAT-172

Musculoskeletal Model Development for Side-to-Side Comparison in ACL Reconstructed Knees

Katlyn Hall¹, Timonthy Tourville², Rebecca Choquette², and Niccolo Fiorentino²
¹University of Vermont, Barre, VT, ²University of Vermont, Burlington, VT

SAT-173

Cavitation in Heterogeneous Environments

Kaylah Ruiz¹, Dhruv Patel¹, Namas Chandra¹, and Maciej Skotak¹
¹New Jersey Institute of Technology, Newark, NJ

SAT-174

Dynamic Structure of Variability of Joint Angles on Split-Belt User-Driven Treadmill

Kelley Kempksi¹, Brian Knarr², and Jill Higginson¹
¹University of Delaware, Newark, DE, ²University of Nebraska at Omaha, Omaha, NE

SAT-175

Load Sharing Between Synergistic Limbs in a Bilateral Biceps Curl Exercise

Keyaira Crudup¹, Huawei Wang², and Antonie van den Bogert²
¹The University of North Carolina at Chapel Hill, Chapel Hill, NC, ²Cleveland State University, Cleveland, OH

SAT-176

Design and Simulation of an Impact Pendulum for Helmet Testing

Kyle Shepitka¹, James Potestivo¹, Derek Petti¹, Efe Ozkaya¹, and Mehmet Kurt^{1,2}
¹Stevens Institute of Technology, Hoboken, NJ, ²Translational and Molecular Imaging Institute, NYC, NY

SAT-177

Isolation and Staining of Fresh Rat Pia-Arachnoid Complex Tissue for Micromechanical Characterization

Luke Langner¹, Zeynep Suar¹, Gloria Fabris¹, and Mehmet Kurt^{1,2}
¹Stevens Institute of Technology, Hoboken, NJ, ²Mt. Sinai Hospital, New York, NY

SAT-178

A Positioning Study for Computational Human Body Models

Madeline Blankenship^{1,2}, Berkan Guleyupoglu², and Scott Gayzik²
¹Clemson University, Clemson, SC, ²Wake Forest-Virginia Tech, Winston Salem, NC

SAT-179

Assessing the Ability to Quantify Collagen Architecture in the Vagina Using X-ray Microtomography

Madeline Preece¹, Katrina Knight¹, Spandan Maiti¹, Raffaella De Vita², Pamela Moalli³, and Steven Abramowitch¹
¹University of Pittsburgh, Pittsburgh, PA, ²Virginia Tech, Blacksburg, VA, ³Magee-Womens Research Institute, Pittsburgh, PA

SAT-180

Quantification of Axonemal Deformation During Flagellar Beating

Maria Mihailescu¹
¹Washington University in St. Louis, St. Louis, MO

SAT-181

3-D Bioprinting Of GelMA-DA on a Rotating Cylindrical Surface

Mason Weems¹, Anthony Powers¹, and Roland Kaunas¹
¹Texas A&M University, College Station, TX

SAT-182

The Effects of Hind Limb Suspension and Cast Mediated Immobilization on Bone Strength by Finite Element Analysis

Matthew Sanseverino¹, Toni Speacht², Henry Donahue³, and Anthony Lau¹
¹The College of New Jersey, Ewing Township, NJ, ²Penn State College of Medicine, Hershey, PA, ³Virginia Commonwealth University, Richmond, VA

SAT-183

Investigating the Effects of Injury-Influenced Observations on Resulting Injury Risk Curves

Matthew Sie^{1,2}, Alexander Baker², and F. Scott Gayzik²
¹University of California, Berkeley, Berkeley, CA, ²Wake Forest University, Winston-Salem, NC

SAT-184

Instrumented Mouthpiece Implementation for the Characterization of Muay Thai Head Impact Exposure

Melanie Hook¹, Brian Tomblin^{2,3}, Logan Miller^{2,3}, Andrea Rich^{2,3}, Jillian Urban^{2,3}, and Joel Stitzel^{2,3}
¹Slippery Rock University, Slippery Rock, PA, ²Virginia Tech-Wake Forest University School of Biomedical Engineering and Sciences, Winston-Salem, NC, ³Wake Forest University Center for Injury Biomechanics, Winston-Salem, NC

SAT-185

Examining Tibiotalar and Subtalar Kinematics through Simulations of Healthy and Pathological Ankles

Micaela Rionda¹, Olivia Dansereau¹, and Jennifer Nichols¹
¹University of Florida, Gainesville, FL

SAT-186

Force Generation by Engineered Skeletal Muscle Tissue

Michael Chi¹, Ounr Aydin², and Taher Saif²
¹University of California, Merced, Merced, CA, ²University of Illinois at Urbana-Champaign, Champaign, IL

SAT-187

A Simulation Study of the Change in Moment Arm of the Semitendinosus Post-ACL Reconstruction

Michaela Dunlap¹ and Zachary Domire¹
¹East Carolina University, Greenville, NC

SAT-188

Stretching Device for Mechanical Cellular Stimulation

Myra Kurosu Jalil¹, Justin Keister¹, Anthony Yin¹, and Chelsey Simmons¹
¹University of Florida, Gainesville, FL

SAT-189

Evaluation of Boxing Headgear Protection Efficiency

Namas Chandra¹, Maciej Skotak¹, Shahbaz Choudhry¹, and Osama Mahgob¹
¹New Jersey Institute of Technology, Newark, NJ

SAT-190

Visualizing Collagen Damage in Impacted Articular Cartilage Using Collagen Hybridizing Peptide

Naomi Alyafei¹, Sonali Karnik², Hessam Noori², and Diane Wagner²
¹University of Texas San Antonio, San Antonio, TX, ²Indiana University Purdue University Indiana, Indianapolis, IN

SAT-191

Cumulative Tibial Load In Uphill and Downhill Load Carriage

Nicholas Baumann¹, Alexa Johnson¹, Joshua Winters¹, Babak Bazrgari¹, John Abt¹, and Nicholas Heebner¹
¹University of Kentucky, Lexington, KY

SAT-192

Beta Oscillatory Brain Activity Increases During Reactive Balance Recovery

Nina Ghosn¹, Aiden Payne², and Lena Ting³
¹Georgia Tech, Atlanta, GA, ²Georgia Tech and Emory University, Atlanta, GA, ³Emory University, Atlanta, GA

SAT-193

Comparison of Tibiotalar and Subtalar Joint Moments Across Models of Healthy and Pathological Ankles

Olivia Dansereau¹, Micaela Rionda¹, and Jennifer Nichols¹
¹University of Florida, Gainesville, FL

SAT-194

Hip Contact Stresses During a Sit-to-Stand Transfer

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SAT-195

Bone Mechanical Property Changes in Rats Exposed to Space Radiation

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SAT-196

Effects of Environmental Factors on Bone Structural Properties

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SAT-197

Regional Quantification of Knee Articular Cartilage Degradation Following ACL Reconstruction

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SAT-198

Impact Attenuation Performance of Playground Surfacing Materials: Effects of Altering the Complying HIC Values of ASTM F1292

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SAT-199

Playground Safety: Relationships between Surface Impact Attenuation, Fall Height & Depth of Loose-fill Surfacing Material

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SAT-200

Stribeck Curve Analysis of the Temporomandibular Joint Disc

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SAT-201

Effects of Gait-related and Gait-unrelated Visual Dual Tasks on Amputee Gait

Shipeng Ou¹, Andrea Brandt², and He (Helen) Huang²
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SAT-202

Residual Limb Strain Within A Socket Prosthesis in Transfemoral Amputees During Walking

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SAT-203

The Development of PIPER 18MO Child Human Body Model and Its Response to Frontal Vehicle Impacts

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SAT-204

Evaluating the Effect of Discarding the 1st Drop during Playground Impact Attenuation Field Testing

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SAT-205

Do Playground Wear-mats Above Loose Fill Preserve Impact Attenuation Performance?

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SAT-206

Enrichment of JEG-3 Cells by Intrinsic Surface Adhesion Properties

Sumaiya Sayeed¹, Christina Bailey-Hytholt¹, Anita Shukla¹, and Anubhav Tripathi¹
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SAT-207

Standing Balance Response Under Challenging Virtual Reality Environments

Sydney Lundell¹, Diana Harbach¹, Tamara Erlich¹, Tessa Hill¹, and Megan Reissman¹
¹University of Dayton, Dayton, OH

SAT-208

Neural Correlates of Body Dynamics

Tyra Bookhart¹, Caitlin O'Connell², Callie Herman², John Mizelle², and Nick Murray²
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SAT-209

A Pre-Computed Brain Response Atlas to Estimate Brain Strains in Automotive Crashes

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SAT-210

A Preliminary Study to Understand Clot Adhesion in Acute Ischemic Stroke

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SAT-211

Effect of Reduced Tendon Stiffness in the Semitendinosus During Running

Victoria Blackwood¹, Zachary Domire¹, and Anthony Kulas¹
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SAT-212

Investigating Hemodynamics in the Berlin Heart EXCOR

Victoria Yuan¹, Nicole Schiavone¹, and Alison Marsden, PhD¹
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SAT-213

Effect of Wedge Height on Triceps Surae Activity with Walking in an Orthopaedic Boot

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SAT-214

Orthogonal Superimposed Perturbation on Shear Thickening Fluids for Sports Equipment and Medical Devices

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SAT-215

A Flexible Motion Sensor for Monitoring Biomechanical Disorders

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Track: Undergraduate Research & Design

Biomedical Engineering Education

SAT-216

Intestinal Lumen May Act as a Reservoir that Delays Mesenteric Lymph-Induced ARDS

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SAT-217

BMES Student Chapter Near-Peer Mentoring in Project Lead the Way Senior Design Projects

Brandon Eckerman¹, Jessica Aldrich¹, Jacob Griffith¹, and Gary Brooking¹
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SAT-218

Quantification of the Deep Squat Motion for Automated Musculoskeletal Injury Risk Assessment

Irfan Zobayed¹, Nicholas Fey¹, and Nathaniel Pickle¹
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SAT-219

Micro-BLIP: A Customized Arduino System for an Instrumentation Course in Bioengineering

Jake Donovan¹ and George Stetten¹
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SAT-220

Development of Miniaturized Syn-bio Based Redox Capacitor to Electrochemically Measure Autoinducer Molecules

Jessa Crites¹, Wu Shang², Chen Yu Tsao², and William Bentley²
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SAT-221

Construction of a Simplified Carotid Artery for Interactive Learning of Fluid Systems

Michal Jones¹, Kathleen Bieryla¹, and Heather Dillon¹
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SAT-222

iEEG Feature Analysis during Epileptogenesis in the Lithium-Pilocarpine Model of Epilepsy

Nicholas Udstad¹, Sai Rudrashetty¹, Noah Hutson¹, Levi Good¹, and Leonidas Iasemidis¹
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SAT-223

Evaluation of Chitosan-Chondroitin Sulphate Nanoparticles System as a Potential ATP Carrier

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SAT-224

Synergistic Effects of Crosslinking Treatments on Therapeutic Laden Hydrogels

Terreill Robertson^{1,2}, Joshua Kernan², Haneen Abusharkh², Alia Mallah², Mahmoud Amr², Juana Mendenhall¹, Arda Gozen², Bernie Vanwie², and Nehal Abu-Lail²
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SAT-225

Problem-Based Learning in the Biomedical Engineering Classroom: How Students Describe Their Group Experiences

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Track: Undergraduate Research & Design

Biomedical Imaging and Instrumentation

SAT-230

Diffusion Tensor Image Analysis of Stroke Damaged Brains Treated with Combined Neural Stem Cell and Physical Therapy

Lauren Grice¹, Harman Ghuman¹, Franziska Nitzsche¹, Madeline Gerwig¹, Alex Poplawsky¹, Jeffrey Moorhead¹, Nikhita Perry¹, Brendon Wahlberg¹, Fabrisia Ambrosio¹, and Michel Modo¹
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SAT-231

Using 3D Models to Visualize Spectroscopic Data

Agastya Vaidya¹, Rajinder Singh-Moon², and Christine Hendon²
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SAT-232

Autofluorescence Excitation-emission Matrices for Quantifying Calcified Deposits

Ahmed Gado¹, Robert Trout¹, and Irene Georgakoudi¹
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SAT-233

Connectivity and Spectral Analysis of Pre- and Post-Ictal Periods using Intracranial EEG

Alesha Jex¹, Linda Larson-Prior², and Diana Escalona-Vargas²
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SAT-234

Developing a Microsoft HoloLens Application for Mastectomy Specimen Visualizations

Alex Zaharan¹, Krista M. Nicklaus^{2,3}, Mary Catherine Bordes³, Gregory P. Reece³, Summer E. Hanson³, Fatima A. Merchant⁴, and Mia K. Markey^{2,3}
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SAT-235

Use of Hyperspectral Ratiometric Analysis for Microvasculature Segmentation in Hamster Window Chamber Model

Alfredo Lucas¹, Daniela Lucas^{1,2}, and Pedro Cabrales¹
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SAT-236

Multiscale Multi-modal Imaging of Ischemic Tissue Microenvironment After Cell-based Therapy

Allison McMinn¹, Jamila Hedhli², Iwona Dobrucka², and Lawrence Dobrucki²
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SAT-237

Visualization of Stain-Free, Slide-Free Multiphoton Histopathology for Cancer Diagnosis

Allison Spaulding¹, Sixian You², and Stephen Boppart²
¹Milwaukee School of Engineering, Milwaukee, WI, ²University of Illinois at Urbana-Champaign, Urbana, IL

SAT-238

Fiber Optic Imaging of Colorectal Cancer Organoids

Amit Cudykier¹, Bryce McCarthy^{1,2,3}, Nicole Levi-Polyachenko^{2,3}, and Shay Soker^{1,2}
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SAT-239

Tumor-Osteocyte Interactions Measured by the FRET-based Vinculin Tension Sensor

Andrew Reeser¹, Fangjia Li², Andy Chen¹, Divya Kota³, Yue Wang¹, Rahul Prakash¹, Hiroki Yokota¹, and Jing Liu²
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SAT-240

Automated Quantification of Cells in Multiple Fluorescently Labeled Images

Aravind Anand¹, Alyssa Deely², Drew Glaser¹, and Steven George¹
¹University of California, Davis, Davis, CA, ²University of California, Davis, Petaluma, CA

SAT-241

Measuring Lung Vessel Tree Growth During Development in Pediatric Patients

Aren Saini¹, Shruti Siva Kumar¹, and Walter O'Dell¹
¹University of Florida, Gainesville, FL

SAT-242

Development of a Terahertz Time-domain Scanner for Topographic Imaging of the Cornea

Arjun Virk¹ and M. Hassan Arbab¹
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SAT-243

Artifact-rejected fMRI Time Series Reconstitution

Avi Matarasso¹, Keith White¹, and Janis Daly¹
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SAT-244

Magnetic Hyperthermia using Iron Oxide Nanoparticles Delivered with a Microneedle Array

Bethany Bogan¹, Pin-Chieh Huang², and Stephen Boppart²
¹Georgia Southern University, Snellville, GA, ²University of Illinois at Urbana-Champaign, Urbana, IL

SAT-245

The Fractal Dimension of Vessel Networks Extracted from 3D Acoustic Angiography Differs Between Tumors and Controls in a Transgenic Mouse Model of Mammary Cancer

Brandon Barrentine¹, Virginie Papadopoulou², Sunny Kasoji³, Paul Dayton², and Sarah E. Shelton⁴
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SAT-246

High-throughput Automated Image Processing Algorithm to Understand Virus-host Interactions in Droplet Microfluidics

Caitlin Grasso¹, Jasmine Shirazi¹, Brian Chambers¹, and Jason Gleghorn¹

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SAT-247

Utilizing 3D Printed Models for Craniofacial Reconstructive Surgery

Caroline Bergeron¹, Lyfong Lor², Philip Brown³, and Christopher Runyan⁴

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SAT-248

Adolescent Brain Mechanical Properties are Affected by Puberty

Catherine Cooper¹, Grace McIlvain¹, Eva H Telzer², and Curtis L Johnson¹

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SAT-249

System for Testing Miniscope Head Mounted Cameras for *In Vivo* Calcium Imaging

Chancey Garrett¹, Nicholas Udstad², P. Timothy Doughty², and Teresa Murray²

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SAT-250

Enhanced Spectral Computed Tomography of Cartilage Using Contrast Agent CA4+

Cheri McChesney^{1,2}, Matthew Getzin¹, Macaire Grobe¹, Taylor Lawson³, Mark Grinstaff³, Ge Wang¹, and Deva Chan¹

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SAT-251

A Mechatronic System for the Magnetic Manipulation of Biomedical Specimens

Claire Kraft¹, Michael Behrens¹, and Warren Ruder¹

¹University of Pittsburgh, Pittsburgh, PA

SAT-252

Traumatic Brain Injury Quantified by S.L.I.M. Microscopy with Omega 3 Fatty Acid Treatments

Darnella Cole¹, Jorge Maldonado², and Catherine Best-Popescu²

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SAT-253

Cerebrovascular Impulse Response to Tactile Somatosensory and Motor Stimulation Measured with fTCD

Dominique James¹, Benjamin Hage², Jake Greenwood², Steven Barlow², and Greg Bashford²

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SAT-254

A Cerebellar-dipole Effect in Electroencephalography Source Localization

Efrain Torres¹ and Scott Beardsley^{1,2}

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SAT-255

Structural Brain Changes in Collegiate Hockey Players Over the Course of a Season

Elizabeth P Dickinson¹, Daniel R Smith¹, Melissa DiFabio¹, Peyton L Delgorio¹, Charlotte A Chaze¹, Nicole A Maguire¹, Thomas A Buckley¹, and Curtis L Johnson¹

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SAT-256

Comparison of Semi-Automated Methods for Segmenting Arachnoid Trabeculae from OCT Images

Emma Luke¹, Nikolaus Benko², and Brittany Coats²

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SAT-257

Development of a Myocardial MRI Imaging Phantom Utilizing Plant-Derived Biomimetic Vascular Scaffolds

Eric Cunningham¹, Keigo Kawaji¹, Austėja Staneviciute¹, Amreen Nasreen¹, Takeyoshi Ota², and Marcella Vaicik¹

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SAT-258

Tracking Changes in Organelle Morphology using a Light-Scatter-Based Label-Free Imaging Technique

Erin Kelly¹, Mohammad Naser¹, Rene Schloss¹, Anton Omelchenko¹, Bonnie Firestein¹, and Nada Boustany¹

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SAT-259

Optimization of Transcranial Ultrasound Contrast Agent-Specific Imaging in Phantom Studies

Esha Kashyap¹ and Brooks Lindsey^{1,2}

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SAT-260

Advanced Optical Imaging to Quantify Morphological Variance in Hippocampal Neurons

Gabriel Evatt-Machado¹, Ghazal Naseri Kouzehgarani², Mikhail Kandel², Gabriel Popescu², and Martha Gillette²

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SAT-261

A Temperature-Based, Selective Condenser for Collection of Glucose from Exhaled Breath

Gabriel Ng¹, Divya Tankasala¹, Michael Smith¹, and Jacqueline Linnes¹

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SAT-262

Effects of Obesity on Cognitive Function

Gabrielle D'Alessandro¹, Mohammed Abdelsaid¹, Amy Barrett¹, and Dulce Gonzalez²

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SAT-263

White Matter Integrity in Pediatric Cerebral Palsy: A Diffusion and MR Elastography Study

Gabrielle M Villiermaux¹, Grace McIlvain¹, Charlotte A Chaze¹, Daniel R Smith¹, Peyton L Delgorio¹, James B Tracy¹, Henry Wright¹, Freeman Miller², Jeremy R Crenshaw¹, and Curtis L Johnson¹

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SAT-264

Optical Coherence Tomography (OCT) Characterization of Applied Loading in a Custom Bioreactor

Helen Xu¹, Dovina Qu¹, James McLean¹, Yu Gan¹, Romare Antrobus¹, Christine Hendon¹, and Helen Lu¹

¹Columbia University, New York, NY

SAT-265

Approaches for Limited-View and Sparse Photoacoustic Tomography Image Reconstruction

Irvane Ngnie Kamga¹ and Parag Chitnis¹

¹George Mason University, Fairfax, VA

SAT-266

Characterization of CD4+ T Cells Using Optical Metabolic Imaging

Isabel Jones¹, Alex Walsh¹, Katie Mueller^{2,3}, Steve Trier¹, Kris Saha^{2,3}, and Melissa Skala¹

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SAT-267

Deep Learning Based Medical Image Generation for Deformable Registration

Jamie McKay¹, Grant Haskins², and Pingkun Yan²

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SAT-268

The New Standard? Assessing Brachial Artery Flow-mediated Dilatation of Handgrip Exercises with Ultrasound

Janee Phillips¹, Yang Zhu², and Michael Insana²

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SAT-269

The Effects of Hematoxylin and Eosin Staining on Light Scattering Measurements of Breast Cancer Extracellular Matrices

Jenna Montague¹, Danielle Desa¹, Kevin Schilling¹, Kelley Madden¹, Bradley Turner¹, and Edward Brown¹

¹University of Rochester, Rochester, NY

SAT-270

An Automated Supine Pressor Test: Implications for the Prediction of Preeclampsia

Jessica Ma¹, Hamna Qureshi¹, Gurmeet Sangha¹, Kirk Foster¹, George Wodicka¹, David Reuter², and Craig Goergen¹

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SAT-271

Calibration of Multi-Tonal Complex for Optical Coherence Tomography Imaging System

John Cooper¹, Sangmin Kim¹, and Brian Applegate¹

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SAT-272

Assessment of Wound Healing in Diabetic Foot Ulcers Through the Use of Subclinical Tissue Oxygenation Measurements Obtained with Near Infrared Spectroscopy

Jorge Barter¹, Edwin Robledo¹, Kacie Kaile¹, and Anuradha Godavarty¹

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SAT-273

A Custom Quadrature Birdcage Coil and Interface For Small Animal Imaging on a Clinical 3T MR Scanner

Joseph Busher¹, Romina Del Bosque², Mathew Wilcox², Travis Carrell², Christof Karmonik³, and Mary McDougall²

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SAT-274

Detection of Skin Hydration Levels Using Novel Air Puff Device

Joshua Dupaty¹, Keith Williams², Antonia Dingeman², Jason Yao², and Stephanie George²

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SAT-275

Building Chemical-Imaging Based Models Using Machine Learning for DCIS Detection

Juan Munoz¹, Shachi Mittal², and Rohit Bhargava²

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SAT-276

Synthesis of an Engineered B7-H3-targeted Affibody-ICG Contrast Agent for Early Breast Cancer Detection

Katharine Nottberg¹, Makenna Laffey¹, Karina Sharma¹, Rakesh Bam¹, Lotfi Abou-Alkacem¹, Lotfi Abou-Alkacem¹, and Katherine Wilson¹

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SAT-277

Effect of Transport Inhibitors on Nanoparticle Distribution in Human Breast Cancer Cells

Katherine Long¹, Hieu T.M. Nguyen², Niloofar Heshmati³, Tania Betancourt³, and James W. Tunnell²

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SAT-278

Optimizing Electropolymerization Conditions of m-Phenylenediamine Coating on Platinum Microelectrodes for Hydrogen Peroxide Detection

Katherine Magee¹, Chao Tan², Shabnam Siddiqui², and Prabhu Arumugam²
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SAT-279

Initial Exploration of In Vivo Photoacoustic-Guided Liver Surgery

Kelley Kempfski¹, Alycen Wiacek², Eduardo Gonzalez², Jasmin Palmer³, Michelle Graham², Bria Goodson⁴, Derek Allman², Huayu Hou², Sarah Beck⁵, Jin He⁵, and Muyinatu Bell²
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SAT-280

Semi-Automatic Segmentation of Intracranial Hemorrhage on Non-Contrast CT Images

Kevin Chung¹, Wu Qiu¹, Hulin Kuang¹, Hyun Seok Choi², Linda Kasickova³, Andrew Demchuk¹, and Bijoy Menon¹
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SAT-281

Association between Physical Fitness and Functional Connectivity in Multiple Sclerosis

Luis Contreras¹, Rachell Bollaert², Lara Pilutti³, Curtis Johnson⁴, Robert Motl⁵, and Brad Sutton²
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SAT-282

Luminescence Spectroscopy of Holmium-Doped Crystals

Madelyn Hoying¹ and Brian Walsh²
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SAT-283

Optical Imaging and Computational Analysis of Metabolic Interactions between Neurons and Glial Cells

Madison Wilson^{1,2}, Andrew Bower^{1,2}, and Stephen Boppart^{1,2}
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SAT-284

Photoacoustic Molecular Imaging of Breast Cancer with a B7-H3 Targeted Affibody-ICG Agent

Makenna Laffey¹, Katharine Nottberg¹, Karina Sharma¹, Rakesh Bam¹, Lotfi Abou-Elkacem¹, and Katherine Wilson¹
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SAT-285

Validation of a Near-Infrared Optical Scanner to Measure Changes in Oxygenation: Phantom Studies

Manuel Vazquez¹, Kacie Kalie¹, Kevin Leiva¹, and Anuradha Godavarty¹
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SAT-286

Tissue Oxygenation Changes in a Large Diabetic Foot Ulcer: Longitudinal Case Study

Maria Saavedra¹, Kevin Leiva¹, Kacie Kalie¹, Francisco Perez-Clavijo², and Anuradha Godavarty¹
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SAT-287

Low-cost 3D-printed Tools for Biomedical Microscopy

Marlo Garrison¹, Claire Kraft¹, Keith Heyde², and Warren Ruder¹
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SAT-288

Portable Low-Cost Blood Flow Monitor Using Laser Speckle Contrast Imaging

Michelle Hedlund¹, Kayvan Tehrani², Yang Liu², Donley Henson², Leidong Mao², and Luke Mortensen²
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SAT-289

High-Speed Measurement of Dynamic Accommodative Changes in Crystalline Lens Thickness using Optical Coherence Tomography

Morgan Benson^{1,2}, Gabrielle Monterano Mesquita^{1,2}, Yu-Cherng Chang^{1,2}, Marco Ruggeri¹, Arthur Ho^{1,3,4}, Jean-Marie Parel^{1,2,3}, and Fabrice Manns^{1,2}
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SAT-290

Modeling Cortical Dynamics of Limb Dominance in Sequential Motor Learning

Natalie Dottle¹, Margaret Marshall², and J C Mizelle²
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SAT-291

Brain Tumor Segmentation Using Convolutional Neural Networks

Neal Patel¹, Daniel Cahall¹, Ghulam Rasool¹, Nidhal Bouaynaya¹, and Hassan Fathallah-Shaykh²
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SAT-292

U-Net Neural Network to Automatically Segment Abdominal Aortic Aneurysm Geometry

Neil Nath¹, Timothy Chung¹, and David Vorp¹
¹University of Pittsburgh, Pittsburgh, PA

SAT-293

Development of New Reference Standards in Mobile Phone-Based Bilirubinometry

Nina Mucciolo¹, Kavya Sreeram¹, Brandon Harrison¹, Alexander Dumont¹, and Chetan Patil¹
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SAT-294

Assessing Brain Reserve Using a Machine-Learning Brain Age Prediction Model

Nishita Muppidi¹, Maria Ly¹, Helmet Karim¹, Howard Aizenstein¹, Akiko Mizuno¹, and William Klunk¹
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SAT-295

Cerebral Blood Flow Changes Associated with Repetitive Head Impact Exposure in Youth Football

Orianna Olson¹, Mireille Kelley¹, Derek Jones¹, Jillian Urban¹, Megan Johnston¹, Elizabeth Davenport², Beverly Snively¹, Youngkyoo Jung¹, Jeongchul Kim¹, Daryl Rosenbaum¹, Alexander Powers¹, Joel Stitzel¹, Joseph Maldjian², and Christopher Whitlow¹
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SAT-296

Quantification of Sleep-Apnea-Induced Cardiac Stress Using Nocturnal Electrocardiography

Pegah Askari¹ and Khosrow Behbehani¹
¹The University of Texas at Arlington, Arlington, TX

SAT-297

Validation of Near-Infrared Optical Scanner to Assess Saturated Oxygen Changes in Response to Breath-Hold

Priscilla Lozano¹, Kevin Leiva¹, and Anuradha Godavarty¹
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SAT-298

Optical Coherence Tomography Using a Bessel Beam for a Greater Depth of Focus

Reece Fratus¹, Siyu Ma¹, and Bruce Gao¹
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SAT-299

Evaluation of Compressive Sensing Absorber at Minimal Photon Counts for Molecular Breast Imaging

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SAT-300

Testing Accelerometers for Developing an Automated Trigger to Detect Entry into Microgravity Conditions

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SAT-301

Analysis of Raman Scattering Patterns as a Diagnostic Tool for Diseases of the Bone

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SAT-302

Snakes Versus ConnectPixels: Segmentation of IR Images for Breast Cancer Detection

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SAT-303

Application of Doppler Ultrasound to Measurement of Spinal Cord Blood Flow in Spinal Cord Injuries

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SAT-304

Assessing the Accuracy of a Novel 3D Modeling Device through Anthropometric Analysis

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SAT-305

Co-registration of MRI-defined White Matter Lesions with Ex-Vivo Histopathology

Shane McKeon¹, Anusha Rangarajan¹, Minjie Wu¹, Nadim Farhat¹, Tales Santini¹, Sossena Wood¹, Tamer Ibrahim¹, Milos Ikonovic¹, Julia Kofler¹, Oscar Lopez^{1,2}, Bill Klunk^{1,2}, and Howard Aizenstein¹
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SAT-306

MRI Analysis of Normal Adenoid Morphology from Infancy to Adulthood

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SAT-307

Validation of Paired-Agent Kinetic Models for Resected Tumor Margin Imaging in Lumpectomy Surgery

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SAT-308

Turbidity Measurement Using A Smartphone

Simran Rajpal¹, Hatice Koydemir¹, Zoltan Gorocs¹, Doruk Karnica¹, and Aydogan Ozcan¹
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SAT-309

Cluster Analysis in Thermal Imaging to Aid in the Diagnosis of Breast Cancer

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SAT-310

Precision and Accuracy of Positioning in World Frame Using Microsoft HoloLens

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SAT-311

Optimizing Cell Segmentation for Physical Phenotyping Using a Data-driven Comparative Assay

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SAT-312

High-Throughput Silver NanoCluster Beacons Activator Sequence Selection

Victor Madrid¹, Yu-An Kuo², Sihua Zhao², Trung Nguyen², and Tim Yeh²
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SAT-313

Understanding the Hallucination Effects of Deep Neural Networks in MR Image Reconstruction

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SAT-314

Effects of Laser Fluence on Laser Activated Nanodroplets Dynamics

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SAT-315

Lights, Camera, Hemodynamics: Novel Technique to Estimate μ_{eff} and Constrain 3D-SCOS Fitting

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SAT-316

Utilizing Miniature Fluorescent Microscopy for In Vivo Calcium Imaging in the Nucleus Accumbens

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SAT-317

Quantitative Analysis of Grayscale Tendon Ultrasound Images of Collegiate Basketball Players

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SAT-318

3D Convolutional Neural Networks for Glioma Prognosis

Conrad Li¹, Hongliang Ren², and Mobarakol Islam²
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SAT-319

3D Contrast-Enhanced Ultrasound Destruction-Reperfusion Imaging with Arbitrary Beam Steering

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SAT-320

Visualizing Signaling Pathways Using High-Resolution Fluorescence Imaging of Single Living Cells

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Track: Undergraduate Research & Design

Cancer Technologies

SAT-321

Focused Ultrasound Stimulates Glioma-derived Extracellular Vesicle Release *In Vitro*

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SAT-322

Validating a Microfluidic Platform for Cancer Cell Migration Study

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SAT-323

The Extracellular Matrix of Cortical Inclusion Cysts is Distinct from the Ovarian Stroma

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SAT-324

Redirection of RNA-nanoparticles to Lymphoid Organs Enhances Antitumor Immunity

Brandon Wummer¹, Adam Grippin¹, Elias Sayour¹, Kyle Dyson¹, Tyler Wildes¹, Jon Dobson¹, and Duane Mitchell¹
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SAT-325

Slow-cycling Cancer Stem Cells Contribute to Immunosuppression in Glioblastoma

Brian Nazareth¹, Adam Grippin¹, Tyler Loche¹, Changlin Yang¹, Ginger Moore¹, Michael Andrews¹, Mariana Dajac¹, Hector Mendez-Gomez¹, James McGuinness¹, Jeannette Lo¹, Aida Karachi¹, Farhad Dastmalchi¹, Catherine Flores¹, Jianping Huang¹, Duane Mitchell¹, Elias Sayour¹, and Loic Deleyrolle¹
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SAT-326

Weak Adhesion Enables Glioblastoma Tumor Cells to Become Invasive by Enabling Efficient Migration through Brain Extracellular Matrix

Bryana Harris¹, Afsheen Banisadr², and Adam Engler²
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SAT-327

Parameterizing an Agent-Based Model of the Bystander Effect Due to β -Lapachone Treatment in Head and Neck Squamous Cell Carcinoma

Carina Rojanaraj¹, Andrew Raddatz², and Melissa Kemp²
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SAT-328

Synergism of Photothermal and Chemotherapeutic Anti-Cancer Treatment Using Indocyanine Green and Doxorubicin-Loaded Nanoparticles

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SAT-329

Cancer-Mediated Angiogenesis of Human Umbilical Vein Endothelial Cells

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SAT-330

Drug Synthesis for Peptide Receptor Radionuclide Therapy

Claire State^{1,2}, Amy Wong¹, Tania Stallons¹, and Amal Saidi¹
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SAT-331

Light Scattering Effects on Laser Coagulation of Blood Vessels

Donovan Moses¹, Fawaz Mohsin², Nitesh Katta³, Michael Gardner³, and Thomas Milner³
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SAT-332

Drug-disruptable OFF-CAR T cells for Treating Solid Tumors

Elise Gray-Gaillard¹, Greta Giordano Attianese¹, Pablo Gainza-Cirauqui², Elisabetta Cribioli¹, Sabrina Vollers², Sailan Shui², Bruno Correia², Melita Irving¹, and George Coukos¹
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SAT-333

Microwave Ablation Energy Delivery Technique: Comparing *Ex Vivo* and *In Vivo* Ablations at Constant Energy

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SAT-334

Vascular Laser Thermolysis of Vessels Varying in Size

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¹University of Connecticut, Simsbury, CT, ²Penn State University, State College, PA, ³University of Texas at Austin, Austin, TX

SAT-335

Cell Microarray on Patterned POEGMA Surface Enables Phenotypic Screening for Drug Resistance

Jay Gupta¹, Daria Semeniak¹, Ryan Soderquist¹, Daniel Joh¹, Angus Hucknall¹, Kris Wood¹, and Ashutosh Chilkoti¹
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SAT-336

Targeting Hyaluronan Interactions for Glioblastoma Stem Cell Therapy

Joline Hartheimer¹, Seungjo Park¹, Shreyas Rao¹, and Yonghyun Kim¹
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SAT-337

Investigation of Stiffness Induced Chemoresistance Driven by EMT

Joshua Krachman¹, Kaitlyn Johnson², Hunter Joyce², and Amy Brock²
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SAT-338

An Optical Patient Alignment and Tracking System for Proton Therapy

Katelyn Zastrow¹, Leah Chung², Brad Kreydick³, George Croutrakon¹, Steven Laub³, and Niek Schreuder⁴
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SAT-339

Co-Cultured Cell Models Mimic Cancer Tumor Microenvironment

Madison Plaster¹, Stephanie Ham¹, and Hossein Tavana¹
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SAT-340

BT-20 Breast Cancer Cells P-Selectin Ligands are Protease Sensitive

Matti Vance¹
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SAT-341

Evaluating the Effects of Microenvironment Pro-inflammatory Cytokines on Breast Cancer Metastasis

Megan Williams¹, Jenna Alsaleh¹, and Cheryl Gomillion¹
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SAT-342

Profiling of Prostate Cancer Biomarkers with Multicolor Carbon Dots

Merwin Berrocales¹, Indu Tripathi², and Dipanjan Pan²
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SAT-343

Generation of Reactive Oxygen Species using Heavy-Metal Doped Carbon Dots

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SAT-344

Detection of Biomarkers for Ovarian Cancer Using Bioconjugated, Single-Use Biosensor

Nicole Buckingham¹, Shiyi Qin², Yinuo Chen², Derek Li³, and Chung Chiun Liu²
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SAT-345

A Study of Early Stage Growth Dynamics in Cancer Reveals Scaling of Growth Rate with Cell Density in BT-474 Breast Cancer Cells

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SAT-346

Smartphone Based Vertical Flow Immunoassay of Circulating Tumor Cells

Ryan Zenhausern¹, Tiffany-Heather Ulep¹, Alana Gonzales¹, and Jeong-Yeol Yoon¹
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SAT-347

High-Throughput Optogenetic Testing of Cardio-Oncological Effects of HDACi in Human Cardiomyocytes

Sarah Schrup¹, Christina Ambrosi¹, Melissa Hadley¹, Alejandro Villagra¹, and Emilia Entcheva¹
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SAT-348

Western Blot Analysis of the Effects of Mechanochemical Disruption on NF-KB and Akt Expression in Prostrate Cancer Cells

Shirley Hong¹, Hakm Murad¹, Charles Kelly¹, Partha Chandra¹, Namrata Khurana¹, Debasis Mondal¹, and Damir Khismatullin¹
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SAT-349

Assessment of T Cell Migration in Aligned Collagen Hydrogels

Sydney Connor^{1,2}, Hawley Pruitt¹, Eugenia Volkova¹, Vitor Tang¹, Daniel Lewis¹, and Sharon Gerecht¹
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SAT-350

Rapid Polarization-Dependent Second-Harmonic Generation

Sylvester Benson-Sesay¹, Edward Brown¹, and Kevin Schilling¹
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SAT-351

Imaging-Based Biophysical Modeling to Differentiate Radiation Necrosis from Tumor Recurrence Following Stereotactic Radiosurgery for Brain Metastasis

Tanner Nickles¹, Saramati Narasimhan², Haley Johnson¹, Ammoren Dohm¹, Michael Miga², Albert Mattia², Michael Chan¹, Jared Weis¹, and Tanner Nickles³
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SAT-352

Automated Analysis of RhoA-FRET Activity During Confined Cancer Cell Migration

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SAT-353

Alternative Culture Methods and Materials for Tumor Organoid Study

Vincent Cornelius^{1,2}, Alexandra Sockell², Christina Curtis², and Polly Fordyce²
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SAT-354

Basement Membrane Proteins as Critical Design Parameters for a Phenotypic Model of Tumor Metastasis

Vu Nguyen¹ and Catherine F. Whittington²
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SAT-355

Intercellular Interaction between PyMT Breast Cancer and Myeloid-Derived Suppressor Cells

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SAT-356

Effect of Aligned Matrix and Heterogeneous Cell Populations on Myoferlin Depleted Breast Cancer Cell Migration

Yevgeniy Gladkiy¹, Vasudha Shukla¹, Daniel Gallego-Perez¹, Douglas Kniss¹, and Samir Ghadiali¹
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SAT-357

Optimizing Activation and Purification for Cathepsin Proteases from Engineered Cell

Yuan Xu¹, William Shockey¹, Megan Ferrall-Fairbanks¹, and Manu Platt¹
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SAT-358

Analyzing the Role of Adipose Stromal Cells in Breast Cancer Cell Migration and Invasion

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SAT-359

Alginate Core-shell Scaffolds for Enhance CAR T Cell Manufacturing

Zahra Mousavi Karimi¹, Nate Dwarshuis^{1,2}, Kirsten Parratt^{1,2}, and Krishnendu Roy^{1,2}
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Track: Undergraduate Research & Design

Cardiovascular Engineering

SAT-360

Characterization of Patient Specific Hemodynamics in Fontan Patients: Potential Indicators for Liver Disease

Alexa Graham¹, Phillip Trusty¹, Zhenglun Wei¹, Jack Rychik², Mark Fogel², and Ajit Yoganathan¹
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SAT-361

Micro Particle Image Velocimetry Flow Measurements in a Stenotic Region

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SAT-362

Evaluation of Platelet and Vascular Smooth Muscle Cell Response on Albumin Coated Polymeric Vascular Grafts

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SAT-363

A Microfluidic Device to Determine the Role of Fiber Alignment on Aortic Valve Cell Behavior

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SAT-364

Assessment of Platelet Dense Granule Trafficking, P2Y1/P2Y12, and Protease-Activated Receptors Interactions in Neonates Utilizing Whole Blood, Small Volume Assays

Anna-Liisa Sepp¹, Anh Ngo², Jawaad Sheriff³, Anne Rocheleau², Micheal Recht², Marvin Nieman⁴, Lisa Malone⁵, Amanda Zigomalas⁵, Wadie Bahou⁵, Danny Bluestein⁵, Owen McCarty², and Kristina Haley²
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SAT-365

Glycocalyx and Inflammation in High Fat Diet Versus Disturbed Blood Flow Conditions

Bailey Ritchie¹, Ajay Rao¹, Gerard O'Neil¹, Ronodeep Mitra¹, and Eno Ebong^{1,2}
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SAT-366

Cardiac Magnetogenetics: Noninvasive Control of the Heart

Brian Davis¹, Lufang Zhou², and Patrick Ernst²
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SAT-367

Microfluidic Simulation of Nanoparticle Delivery to Arterial Endothelial Cells

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SAT-368

Investigating Endothelial to Mesenchymal Transformation-Derived Activated Fibroblast Behavior in a 3D Culture Environment

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SAT-369

The Effect of Hepatic Vein Inclusion on Numerical Assessment of Hepatic Flow Distribution for Fontan Patients

Connor Huddleston¹, Zhenglun Alan Wei¹, Phillip Trusty¹, Max Greenbaum², Shelly Singh-Gryzbon¹, Timothy Slesnick³, and Ajit Yoganathan¹
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SAT-370

Improving Clinical Diagnostic Methods for Group 1 Pulmonary Hypertension with ECHO and MRI-Derived Parameters

Daniel Pearce¹, Veeranna Maddipati², C. Bogdan Marcu³, and Stephanie George¹
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SAT-371

Quantification of Neo-sinus Thrombus Volume in Patients post-Transcatheter Aortic Valve Replacement

Emelia Funnell¹, Phillip Trusty¹, Vahid Sadri¹, Rahul Sharma², Raj Makkar², and Ajit Yoganathan¹
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SAT-372

Replicating Tissue through 3D Printing with Novel Copolymers

Ethan Stokes¹, Jack Xhemali¹, Arash Afshar¹, Anna Seo², and Sinjae Hyun¹
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SAT-373

Microfluidic Device Functionalized for Blood Components Separation

Fangchi Shao¹, Payam Amiri¹, Reza Hajian¹, and Kiana Aran¹
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SAT-374

Disturbed Flow and Glycocalyx Degradation Increase Vessel Uptake of Gold Nanospheres

James Lister¹, Ming Cheng¹, Nandita Bal¹, and Eno Ebong¹
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SAT-375

Dedifferentiation of Differentiated Vascular Constructs for Disease Modeling

Jasmine Villegas^{1,2}, Emily Caron², and Marsha Rolle²
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SAT-376

The Biomechanical Properties of the Tricuspid Valve Annulus in Radial and Circumferential Direction

Jennifer Lee¹, Fathima Zainab Hassan Iqbal¹, and Shamik Bhattacharya¹
¹Southeast Missouri State University, Cape Girardeau, MO

SAT-377

Elucidating the Effects of Compressive Loading on Microvascular Growth *In Vitro*

Joann Gu¹, Marissa Ruehle², Laxminarayanan Krishnan², Steven LaBelle³, Jeff Weiss³, Robert Guldberg², and Nick Willett^{2,4}
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SAT-378

***In Silico* Screen For Novel Anti-angiogenic Agents Via Inhibition Of Actin:Profilin1 Interaction**

Jordan Sturm¹, David Gau¹, Paul Francoeur¹, David Koes¹, and Partha Roy¹
¹University of Pittsburgh, Pittsburgh, PA

SAT-379

***In Vitro* Tissue Engineered Blood Vessel System for Modeling Vascular Disease**

Joyce Zhou¹, Alexander Tsai¹, Hayeun Ji¹, Yeh-Hsing Lao¹, and Kam Leong¹
¹Columbia University, New York, NY

SAT-380

Platelet Presence Maintains Activity of Contact Pathway Members in Coagulation.

Katherine Trese^{1,2}, Stéphanie Reitsma², Cristina Puy², and Owen McCarty²
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SAT-381

The Effect of Pulsatile Flow on Heat Transfer Surrounding a PAC Heating Filament used to Monitor Cardiac Output

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SAT-382

Development and Validation of a Model for Simulating Post-TAVR Hemodynamics at Peak Systole

Kun-huck Choi¹, Shelly Singh-Gryzbon¹, Vahid Sadri¹, Sanchita Bhat¹, Mandy Salmon¹, Alan Wei¹, and Ajit Yoganathan¹
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SAT-383

Mimicking Blood Rheology for More Accurate Blood Modeling in Benchtop Research

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SAT-384

Computational Fluid Dynamics Model of Transport through a Membrane in a Microfluidic Device

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SAT-385

The Effect of Downstream Resistance on Hemodynamics in Coronary Artery Bypass Graft Using Windkessel Model

Megan Stevens¹ and Stephanie George²
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SAT-386

Modeling the Effects of Stent Strut Geometry on the Capture Efficiency of a Magnetizable Stent

Nicole Patterson¹, Nardine Ghobrial², and Delphine Dean²
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SAT-387

Development of a Model for Accelerated Fatigue Testing of Venous Valves

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SAT-388

Comparison of Flow Characteristics within Stenosed Arterial Models using CFD and MRI

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SAT-389

Towards an Automated Pre-Processing Algorithm for Machine Learning of EKG Online Databases

Sarah Miller¹ and Timothy Reissman¹
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SAT-390

Characterizing the Morphology in the Common Carotid Arteries of a Transgenic Mouse Model of Sickle Cell Disease

Shuangyi Cai¹, Christian Rivera¹, Hannah Song¹, George McAlear¹, and Manu Platt¹
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SAT-391

Modeling Fibroblast Migration in Healing Rat Myocardial Infarcts

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SAT-392

Pre-Processing for Fluid-Structure Interaction Modeling of the Left Ventricle: Procedure for Anatomical Modeling

Tiffany Netto¹, Keshav Kohli¹, Gianni Natale¹, Atharv Marathe¹, Vasilis Babaliaros², John Oshinski², and Ajit Yoganathan¹
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SAT-393

Pre-Processing for Fluid-Structure Interaction Modeling of the Left Ventricle: Anatomical Mesh Registration

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SAT-394

Development of a Feedback Controlled Mechanical Model of a Multi-Lymphangion System

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SAT-395

Aortic Valve Leaflet Curvature Alterations After Elastin Degradation

Ahmed Ali¹, Melake Tesfamariam¹, Daniel Chaparro¹, Melissa Hendon¹, Joshua Hutcheson¹, and Sharan Ramaswamy¹
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SAT-396

Towards 3D Printing of a Bio-mimetic Hydrogel Scaffold For Tissue Engineering Heart Valve Applications

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Track: Undergraduate Research & Design

Cellular and Molecular Bioengineering

SAT-397

Cell Motility of Triple Negative Breast Cancer Cells

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SAT-398

Pharmacological Inhibition of Myocardin-Related Transcription Factor as a Novel Strategy to Inhibit Growth and Migration of Triple-Negative Breast Cancer Cells

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SAT-399

Effect of Mucopolidosis Type IV Astrocytes on Microglial Storage and Degradation

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SAT-400

Engineering of Biomimetic Multicellular Liver Model

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SAT-401

Targeted Antibiotic Administration Facilitated with a Biofabricated Microfluidic Platform

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SAT-402

Step-Changes in Matrix Stiffness Cause Endothelial Cell-Matrix Adhesion Remodeling

Archit Potharazu¹, Jacob VanderBurgh², and Cynthia Reinhart-King^{1,2}
¹Vanderbilt University, Nashville, TN, ²Cornell University, Ithaca, NY

SAT-403

Breast Cancer Cells Interact With L-selectin Under Flow Conditions

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¹Ohio University, Athens, OH

SAT-404

The Effect of CD44 and Src Kinases on Aggressive Motility Present in Glioblastoma

Caleb Choy¹, Kayla Wolf¹, and Sanjay Kumar¹
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SAT-405

Studying Genetic Circuit Stability in Pluripotent Stem Cells.

Chelsea Gibbs¹ and Tara Deans¹
¹University of Utah, Salt Lake City, UT

SAT-406

Biochemical Inhibition of Key Signaling Molecules in Lepidodactylus Lugubris Affects Tail Regeneration

Christian DeMoya¹, Thomas Lozito¹, Ricardo Londono¹, Megan Hudnall¹, Sara Kenes¹, and Danielle Danucalov¹
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SAT-407

Characterization of Engineered Fibrinogen to Understand the Role of the α C Region in Fibrin Mechanical Properties and Polymerization during Haemostasis

Christopher R. Gough^{1,2}, Taylor C. Dement¹, Sarah Spangler¹, and Nathan E. Hudson¹
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SAT-408

Improving Efficiency of CRISPR-based Gene Editing by Inactivation of the NHEJ Pathway

Colin Hiscox¹, Ben Everhart², Puloma Sen², Subhadra Jayaraman², and Kaiming Ye²
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SAT-409

Development of a Multi-parametric Cell Enrichment Technique for Low Cell-Number Populations

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SAT-410

Staphylococcal Nuclease as a Model System for Investigating the Interaction between SND1 and MTDH

Dominique WuDunn¹
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SAT-411

Bioconditioning Nanoengineered Ionic-Covalent Entanglement Bioink Structures to Promote Osteogenesis

Eli Mondragon¹, Zachary Richards¹, Candice Sears¹, David Chimene¹, Nick Sears¹, Eoin McNeill², Akhilesh Gaharwar¹, Carl Gregory², and Roland Kaunas¹
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SAT-412

Understanding the Role of the Glycocalyx in Whole Cell Mechanics Measurements

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SAT-413

Regulated Expression of Cre Granted by a Drug Induced, Self-Excising Cre Construct in 293T Cells

Emily Puleo¹, Kristen Fread¹, and Eli Zunder¹
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SAT-414

Kinetic Characterization of Nitrite Reduction to NO by the Molybdopterin Enzyme mARC2

Eric Cecco^{1,2,3}, Jesus Tejero^{1,2,4}, Mark Gladwin^{1,2,4}, and Courtney Watkins^{1,2,4}
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SAT-415

Investigating Protease Regulation in Macrophages Using mRNA Transfection

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SAT-416

Accessing Native Microtubule Structure in Cells for Kinesin Motility Assay

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SAT-417

The Role of Desmosome In 3D Epithelial Acini Formation

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SAT-418

Characterizing the Dynamics of Macrophage Polarization and Signaling

James Forsmo¹, Laura Weinstock¹, and Levi Wood¹
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SAT-419

Fibroblast Derived Matrix as a *In Vitro* Model of Diabetic Cardiomyopathy

John Bradford¹, Omar Cardona², Stephan Nieuwoudt³, and Samuel Senyo⁴
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SAT-420

The Achilles Heel of TP53 Mutant Breast Cancers

John Warrington¹, Changlong Liu¹, Carolyn Banister¹, and Phillip Buckhaults¹
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SAT-421

Elongated Cell Shape Directs Mesenchymal Stem Cell Differentiation to Smooth Muscle Cell via MiR-145

Katherine Nguyen¹, Clarissa Hoffman¹, Yi-Ting Yeh¹, Kuei-Chun Wang¹, and Shu Chien¹
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SAT-422

Lonafarnib Reduces Hutchinson-Gilford Progeria Fibroblast Cell Death During Biomechanical Strain

Katie Tieu¹, Brooke Danielsson¹, and Daniel Conway¹
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SAT-423

Optimizing Force-Dependent Zyxin Dynamics Using Substrate Stretch

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SAT-424

Altered Waveform and Propulsion in Flagella of Mutant Alga Lacking Proximal Inner Dynein Arms

Kyle Thomas¹, Mathieu Bottier¹, Susan Dutcher¹, and Philip Bayly¹
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SAT-425

Physical Properties of Electrospun Nanofibrillar Scaffolds and Effects on Astrocyte Reactivity

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SAT-426

A β Secondary Structure Change Associated with Lipid Insertion in Alzheimer's Disease

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SAT-427

Presence of Endogenous MiR-122 and MiR-451 in an *In Vivo* Rat Osteoarthritis Model

Madeline Hays¹, Kayla Scott¹, David Cohen¹, Zvi Schwartz², and Barbara Boyan^{1,3}

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SAT-428

Fine-Tuning of Noise in Gene Expression with Nucleosome Remodeling

Melina Megaridis¹, Yiyang Lu¹, Erin Tevonian¹, Kendall Junger¹, Jennifer Moy¹, Kathrin Bohn-Wippert¹, and Roy Dar^{1,2,3}

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SAT-429

Using All-optical Cardiac Electrophysiology with Compartment-specific Genetically-encoded Calcium Indicators

Michael Degaga¹, Julie Han¹, Weizhen Li¹, and Emilia Entcheva¹

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SAT-430

Engineering Mammalian Fluorescent Reporter Cell Lines for Pooled CRISPR/Cas9 Screens

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SAT-431

Magnetorheological Elastomers Demonstrate Rho-Dependence of Stiffness-Induced Fibroblast Spreading

Myan Bhoopalani¹, Alexia Vite¹, Elise Corbin¹, Eliot Peyster¹, and Kenneth Margulies¹

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SAT-432

Micropatterning to Measure Mechanical Forces during EMT

Nicole Rinaldi¹, Brian Griffin², and Christopher Lemmon²

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SAT-433

Characterization of Physical Interactions Between Epithelial Cells and Fibroblasts

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SAT-434

***In Vitro* Three-dimensional Model Recapitulates Malignant and Non-malignant Mineral Deposition.**

Nithya Narayanan¹, Akhil Patel², and Shilpa Sant²

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SAT-435

A Novel Luciferase Assay to Quantify Hedgehog Signaling *In Vitro*

Rebecca Mancusi¹ and Brian Callahan¹

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SAT-436

Breast Cancer Cell Membrane Coated Nanoparticles Induce Anti-inflammatory Macrophage Response

Rohini Kumar¹, Jessica Widman², Chelsea Krainak², and Laura Suggs²

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SAT-437

PMA Stimulation of Glial Cells via Thiol Nanoparticle Surface Modifications

Sneha Jeevan¹, Kevin Woeppel¹, and Xinyan Cui¹

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SAT-438

Reversal of Chondrocyte Aging to Augment Cartilage Regeneration in the Elderly

Sreyas Ravi¹, He Shen², Xinyu Li², Rocky Tuan², and Hang Lin²

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SAT-439

An Investigation of Electroporation of Cell Suspensions and Adherent Cells

Stephen Mut¹, Joseph Sherba², Stephen Hogquist², and Jeffrey Zahn²

¹Colorado School of Mines, Golden, CO, ²Rutgers, The State University of New Jersey, Piscataway, NJ

SAT-440

Efficient Activation of Gene Expression for Cardiomyocyte Differentiation

Tamara Brown¹, Xiaojun Lian², and Agamoni Bhattacharyya²

¹Geneva College, McSherrystown, PA, ²Pennsylvania State University, State College, PA

SAT-441

Comparison of CRISPR-Cas9 and Cas12a On-Target Activity in Hepa 1-6 Cells

Taylor Bryson¹, Tanner Rathbone¹, and Renee Cottle¹

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SAT-442

DNA Fingerprinting with CRISPR Cas9 and UDAR

Zachary Burd¹ and Stephanie McCalla¹

¹Montana State University, Bozeman, MT

SAT-443

Motility-Limited Aggregation of Mammary Epithelial Cells into Fractal-Like Clusters

Zachary Neronha¹, Susan Leggett¹, Dhananjay Bhaskar¹, Jea Yun Sim¹, Theodora Perdikari¹, and Ian Wong¹

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SAT-444

Chronological Event Recording of Stimuli using CRISPR/Cas9-mediated Base Editing

Vivian Hu¹, Evan Becker¹, Matthew Greenwald¹, Tucker Pavelek¹,

Elizabeth Pinto¹, Zemeng Wei¹, Cheryl Telmer², Natasa Miskov-

Zivanov¹, Jason Lohmueller¹, Sanjeev Shroff¹, and Alex Deiters¹

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Track: Undergraduate Research & Design

Device Technologies and Biomedical Robotics

SAT-445

AirCure: A 2in1 System For 3D SLA Prints and Medical Applications

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SAT-446

A Simple, Portable System for Diagnosing and Monitoring Sickle Cell Disease

Alex Jolly¹, Michael Ripperger¹, Kevin Cyr², Jonathan Ehrman¹, Jennifer Colby³, and Christina Marasco¹
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SAT-447

A Sweat Chloride Sensor: Eliminating the Need for Sensor Calibration

Amrita Ladwa¹, Thomas Ghebreyesus¹, Dong-Hoon Choi¹, and Peter C. Searson¹
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SAT-448

Artificial Neural Network to Classify Human Forearm Muscle Signals for Individual Finger Movement of a Robotic Hand

Anne Dowling¹ and Jaydip Desai¹
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SAT-449

Modeling Daily Emotional State Fluctuation using Passively Collected Smartphone Data

Arpan Kaphle¹, Sandya Subramanian¹, and Trish Cotter¹
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SAT-450

Micro-Feeding System (MFS) for Cell Culture Studies

Brandon Durham¹, Andrea Afanador¹, Adrian Alapag¹, Bruno Amaro¹, and Robert Hood¹
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SAT-451

Development of a Wireless Load Cell for use in Motion Analysis for Balance Training Projects

Braault Atemazem¹ and Jakob Leiva¹
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SAT-452

Trust in Robot-Assisted Surgery

Chloe Topolski¹, Akole Mensah¹, and Caroline Cao¹
¹Wright State University, Dayton, OH

SAT-453

In Vitro Validation of Custom-Implantable Oxygen Sensors for Bone Defect Characterization

Clinton Smith^{1,2}, Brett Klosterhoff², Nick Willett^{2,3}, and Robert Guldberg²
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SAT-454

Electro-Stimulatory Bioreactor for Cell Culture on Piezoelectric Scaffolds

Cynthia Perez¹, Solaleh Mair¹, and Teja Guda¹
¹University of Texas at San Antonio, San Antonio, TX

SAT-455

Flexible Silicon-Based Bioresorbable Photonic Temperature Sensors

Di Wu¹, Wubin Bai¹, and John Rogers¹
¹Northwestern University, Evanston, IL

SAT-456

Demonstrating the Viability of Using Zinc-Air Batteries in Oxygen Sensors for Low-Resource Settings

Diego Nigoa¹, Sanjana Mandilwar¹, Rachel Fenner¹, Melissa McCullough¹, John DesJardins¹, William Richardson¹, and Delphine Dean¹
¹Clemson University, Clemson, SC

SAT-457

The Effect of Powered Assistance on Uphill Human Walking Using a Robotic Knee Exoskeleton

Eun Chan Kwak¹, Dawit Lee¹, and Aaron Young¹
¹Georgia Institute of Technology, Atlanta, GA

SAT-458

Stretchable Fiber Optic Sensors for Soft Robotics

Gabriela del Valle Pérez¹, Qidi Liu², and Mable Fok²
¹University of Puerto Rico at Mayagüez, Mayagüez, Puerto Rico, ²University of Georgia, Athens, GA

SAT-459

Efficacy of Varying Angle Wedge Constructs in the Correction of Spinal Deformity

George Vithoulkas¹, Eric Taleghani¹, Alexander Singh¹, Rohit Rustagi¹, and Hasan Syed¹
¹University of Virginia, Charlottesville, VA

SAT-460

Evaluating Occlusion Success of Esophoclude Prototypes in Comparison to Diameter and Radial Force

Gordon Bryson¹, Youngjae Chun¹, and Philip Carullo²
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SAT-461

In Vitro Viability Testing of pH Sensor Incorporation in Tongue Prosthetic Assist Device for Treating Dysphagia

Jack Hastings¹, Neil Gildener-Leapman², and Youngjae Chun¹
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SAT-462

System to Record Therapeutic Delivery Window of Stochastic Vibrotactile Stimulations in Infants with Neonatal Abstinence Syndrome

Jacob Meadows¹, Elisabeth Salisbury², and Mark Gartner¹
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SAT-463

Comparing Machine Learning Models for Diagnosis of Patient Delirium in the ICU Using Actigraphy Data

Jacob York¹, Anis Davoudi¹, Azra Bihorac¹, and Parisa Rashidi¹
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SAT-464

Validating FingerSight with a 3D Infrared Tracking System

Janet Canady¹, Shantanu Satpute¹, Roberta Klatzky², and George Stetten¹
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SAT-465

Investigation of Porous Materials for Flexible Pressure Sensors

Jeremy Decker^{1,2}, Taissa Michel¹, and Wei Xue^{1,2}
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SAT-466

Effect of Modulating Music Volume in the Operating Room

Jesse Li¹, Joseph Schlesinger², and Christy Crockett²
¹Vanderbilt University, Nashville, TN, ²Vanderbilt University Medical Center, Nashville, TN

SAT-467

Sensitivity Analysis of Feedback Controllers for Human-Prosthetic Systems Using H-Infinity Model Matching

Julia Costacurta¹, Luke Osborn¹, Nitish Thakor¹, and Sridevi Sarma¹
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SAT-468

Fabrication of Flexible and Stretchable Temperature Sensors from Recordable Compact Discs

Kaitlin Enright¹, Julia Wilcox¹, Sai Ken Ho Hung¹, and Ahyeon Koh¹
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SAT-469

Real-Time Subtle Prompting with Assistive Device for Autistic Population 2 (ADAP2)

Karen Immanuel¹, Patricia Iglesias¹, Melissa Nguyen¹, Jeffrey Kim¹, and Alev Erdi¹
¹New Jersey Institute of Technology, Newark, NJ

SAT-470

A Novel Method for Inducing Slips During Treadmill Walking

Marcus Jones¹, Huawei Wang¹, and Antonie van den Bogert¹
¹Cleveland State University, Cleveland, OH

SAT-471

Design of a Flexible Plantar Pressure-Sensing Insole for Gait Analysis

Matthew Gothard¹, Jonathan Ehrman¹, and Christina Marasco¹
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SAT-472

Physiological Monitoring System for Firefighters on Duty

Miguel Huerta¹, Essey Reda², Tai Le², Tadesse Ghirmai², and Hung Cao¹
¹University of Washington, BOTHELL, WA, ²University of Washington, Bothell, WA

SAT-473

Investigating EDA and ECG to Monitor Physiological Stress Responses to Inadequate Sensory Information

Mitchell Young¹, Isaac Maze¹, James Sampson¹, and Reva Johnson¹
¹Valparaiso University, Valparaiso, IN

SAT-474

Biomechanical Rehabilitation: Accessibility of Musical Systems through Drawing Music

Natasha Gilbert¹, Navit Roth², and Orit Braun Benyamin²
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SAT-475

Development of a High Throughput Bioreactor Compression Chamber for Rodent Mechanobiology

Nicholas Gabriel¹, Rahul Ramanathan¹, Kevin Bell¹, Nam Vo¹, and Gwendolyn Sowa¹
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SAT-476

Continuous Maternal and Fetal ECG Extraction and Monitoring System with Secure Bluetooth Low Energy Connection

Nicholas Maritato¹, Yeeun Cho², Erik Maldonado³, Crystal Macias⁴, Tai Le³, Geetha Thamaras³, Tadesse Ghirmai³, and Hung Cao³
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SAT-477

A 3D-Printed Device for Enhanced Deployment of Living Biosensors of Infectious Diseases

Paul Movizzo¹, Zhicheng Long¹, and Warren Ruder¹
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SAT-478

Neural Network Based Estimation of Gait Phase in a Powered Hip Exoskeleton

Pratik Kunapuli¹, Inseung Kang¹, and Aaron Young¹
¹Georgia Institute of Technology, Atlanta, GA

SAT-479

Wearable and Wireless Electrocardiogram Monitoring through an Embedded-Linux Platform

Ritik Patnaik¹ and Logan Porter¹
¹University of North Texas, Denton, TX

SAT-480

Loop Design and Constituent Components Introduce Artifacts Impacting Overall System Thrombogenicity

Ryan Walk¹, Mengtang Li², Yana Roka Moii¹, Eric Barth², and Marvin Slepian¹
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SAT-481

Analyzing the Anatomical Motion of Shape-Memory Actuators in Hand Exoskeletons when Grabbing Objects

Sean Vincent Herrera¹ and Michael Zabala¹
¹Auburn University, Auburn, AL

SAT-482

Design and Assessment of Low-Cost Ostomy Pouches Universally Compatible with Disposable Bags

Shravya Kakulamarr¹, Caroline Lee¹, and Liseth Perez-Sanchez¹
¹Rice University, Houston, TX

SAT-483

Reinforcement Learning Motion Control Paradigm for Minimally Invasive Robotic Surgery

Timothy Wroge¹, Mobarakol Islam², Xiao Xiao², and Hongliang Ren²
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SAT-484

Development of The Handle Grip of a Walker for Hemiplegic Post-Stroke Patients

Tyler Bray¹, Ben Emergi², and Orit Braun Benyamin²
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SAT-485

Developing Soft Robotics Exoskeleton and Testing EMG as a Potential Biofeedback Control

Tyler VanBuren¹, Thassy da Silva Pinto¹, Laura Nye¹, Joseph Lucas¹, Galit Pelled¹, and Xiaobo Tan¹
¹Michigan State University, East Lansing, MI

SAT-486

The Value of EMG for Estimating Continuous Locomotion Parameters During Human Ambulation

Will Flanagan¹, Jonathan Camargo¹, and Aaron Young¹
¹Georgia Institute of Technology, Atlanta, GA

SAT-487

Comparison of Surgical Staplers' Ability to Clamp and Analysis of Clamp Force Using a Benchtop Model

William DeMaria¹, Nick Reher¹, and Beth Contini¹
¹Medtronic, North Haven, CT

SAT-488

A Feasibility Study of a Ferrofluid Derived Cardiac Energy Harvester for Micro-Pacemaker Devices

Zachary Siu¹, William Agnew¹, Brittanie Chu¹, Joshua Wang¹, Lillian Chang¹, and William Tang¹
¹University of California, Irvine, Irvine, CA

SAT-489

HoloLens-based Augmented Reality Obstacle Avoidance Training Has Varying Impact on Individuals' Obstacle Avoidance Strategies

Ziwei Liu¹, Stephanie Huang¹, Ming Liu¹, Robert Hinson¹, and Helen Huang¹
¹NC State University, Raleigh, NC

SAT-490

Accelerated Prosthesis Prototyping with Augmented Sensor Network

Justin Fritter¹, Maximilian Gravenstein², Mohamed Abdelhady³, and Dan Simon³
¹University of Texas at Tyler, Whitehouse, TX, ²Penn State University, Lewisburg, PA, ³Cleveland State University, Cleveland, OH

SAT-491

Development of DNA Aptamer Functionalized Conductive Polymer Electrochemical Biosensor for the Detection of Disease

Nakya Mesa-Diaz¹, Kelli Burke¹, Shiva Rastogi¹, Marisa Snapp-Leo¹, Jennifer Irvin¹, and Tania Betancourt¹
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SAT-492

Habit Forming App for Comparing Photos and Fitness Data

Gongwei Chen¹, Joochan Kim¹, Nicole Hershkowitz¹, Steven Crimarco¹, and M. Ete Chan¹
¹Stony Brook University, Stony Brook, NY

Track: Undergraduate Research & Design

Drug Delivery

SAT-493

Development of Single Housing Injectors for Hypoglycemia Emergency Glucagon Kits

Abdul-Nafea Syed¹
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SAT-494

Quantifying Effects of The Order and Dosing of Combination Targeted and Chemotherapy Cellular Proliferation in an *In Vitro* Longitudinal Study Of HER2+ Breast Cancer

Alay Shah¹, Tessa Davis¹, Angela Jarrett¹, Thomas Yankeelov¹, and Anna Sorace¹
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SAT-495

Rational Design of Subunit Vaccines for Tuberculosis using PEG-bi-PPS Bicontinuous Nanospheres

Amy Xie¹, Sean Allen¹, and Evan Scott¹
¹Northwestern University, Evanston, IL

SAT-496

Doxorubicin Modification Promotes Encapsulation for Magnetically Triggered Drug Release from Nanoparticles

Angela Jimenez¹, Eric Fuller¹, Georg Scheutz¹, Brent Sumerlin¹, and Carlos Rinaldi¹
¹University of Florida, Gainesville, FL

SAT-497

Broad-spectrum Antimicrobial Activity in Bone Cement Using an Affinity-Based Drug Delivery System

Chao-yi Lu¹, Erika Cyphert¹, Dylan Marques¹, Greg Learn¹, and Horst von Recum¹
¹Case Western Reserve University, Cleveland, OH

SAT-498

Optimization of Polymersomes for Delivery of Nerve-Regenerating Peptides

Cheyenne Brady¹, Austin Evers¹, Pabitra Sahoo², Jeffrey Twiss², and Jessica Kelly¹
¹Clemson University, Clemson, SC, ²University of South Carolina, Columbia, SC

SAT-499

Impact of Size on Cytoplasmic Mobility of Nanoparticles

Christian Figueroa-Espada¹, Mohammad Zahid², Vladimir Kolossov², and Andrew Smith²
¹University of Puerto Rico, Mayagüez, Mayaguez, PR, ²University of Illinois at Urbana-Champaign, Urbana, IL

SAT-500

Optimizing Endosomal Polymeric Emulsions for Intracellular Nucleic Acid Delivery

Danielle Liu¹, Sean Bedingfield¹, Meredith Jackson¹, Isom Kelly¹, and Craig Duvall¹
¹Vanderbilt University, Nashville, TN

SAT-501

Induced Hyperthermia Using Synthesized Iron Oxide Nanoparticles

Gabriela Hernandez¹, Lara Heersema², Stephanie Hufnagel², Zhengrong Cui², and Hugh Smyth²
¹Boston University, Boston, MA, ²University of Texas at Austin, Austin, TX

SAT-502

3D Printed Hollow Microneedles for Controlled Drug Delivery

Ian Ghanavati¹, Zack Bonick¹, Carina Russell¹, Hossein Derakshandeh¹, Fariba Aghabaglou¹, and Ali Tamayo¹
¹University of Nebraska-Lincoln, Lincoln, NE

SAT-503

Development of a Drug Delivery System using Ribociclib and Sunitinib for Pancreatic Neuroendocrine Tumor Treatment

Jacob Boles¹, Kimberly Ornell¹, and Jeannine Coburn¹
¹Worcester Polytechnic Institute, Worcester, MA

SAT-504

Lectin A-Targeted Nanoparticles for the Inhibition of Biofilm Formation by Pseudomonas aeruginosa

John Liu^{1,2}, Tyler Flockton¹, Logan Schnorbus¹, and Lark Perez¹
¹Rowan University, Glassboro, NJ, ²University of Minnesota-Twin Cities, Minneapolis, MN

SAT-505

Evaluating the Biodegradable Capabilities of 3D-printed Polymeric Drug Delivery Implants for Controlled Release

Joshua Gale¹, Austin Schoppe¹, Ignacio Aguilera¹, Priya Jain^{1,2}, and R. Lyle Hood^{1,2}
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SAT-506

Controlled Release Optimization of Ceftriaxone and N-Acetyl Cysteine for Transtympanic Delivery

Katherine Dunkelberger¹, Liza Bruk¹, and Morgan V. Fedorchak¹
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SAT-507

Nanoparticle-Based GABA Delivery for Beta Cell Regeneration in Type-1 Diabetes

Kevin Ling¹, Mallika Bhatta¹, Matthew Becker¹, Robert Dolan¹, Joshua Stewart¹, Noah Barnes¹, Benjamin Keselowsky¹, and Edward Phelps¹
¹University of Florida, Gainesville, FL

SAT-508

Enhancing Magnetic Nanoparticle Based Transfection Efficiency via Application of an Oscillating Magnet Array Post-Transfection

Mackenzie Grubb¹, Lia Blokpoel Ferreras², Jon Dobson¹, and James E. Dixon²
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SAT-509

Synthesis of Chemotherapeutic Prodrugs for Enhanced Delivery via Lipid-Based Vehicles

Meghan Hill¹, Mendi Marquez¹, Liliya Frolova¹, and Michaelann Tartis¹
¹New Mexico Institute of Mining and Technology, Socorro, NM

SAT-510

Effects of Chemical Priming on Nonviral Gene Delivery to Human Mesenchymal Stem Cells

Michael Miller^{1,2}, Tyler Kozisek², Andrew Hamann², Albert Nguyen², and Angela Pannier²
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SAT-511

Triblock Copolymer-Based siRNA Polyplexes With Hydrophobically Stabilized Cores Have Improved Bioactivity, Stability, and Tumor Delivery Relative to Diblock Formulations

Mitchell Stokan¹, Meredith Jackson², Sean Bedingfield², Thomas Werfel², Mukesh Gupta², Eric Dailing², and Craig Duvall²
¹University of Kentucky, Elizabethtown, KY, ²Vanderbilt University, Nashville, TN

SAT-512

The Effect of Combination Adjuvants on Immune Response

Neha Narang¹, Randall Toy¹, Pallab Pradhan¹, and Krishnendu Roy¹
¹Georgia Institute of Technology, Atlanta, GA

SAT-513

Characterization of Drug-Eluting Nanofiber Scaffolds for Use with Biliary Stents

Robyn Guru¹, Abigail Williams¹, Amanda Cimino¹, Jeffrey Hugdahl¹, Garland Crawford¹, and Joanna Thomas¹
¹Mercer University, Macon, GA

SAT-514

Development and Characterization of Gold Nanoparticles for Plant Genetic Engineering

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¹University of Michigan, Ann Arbor, MI, ²UC Berkeley, Berkeley, CA

SAT-515

Feasibility and Optimization of Composite Hydrogel/PLGA Particles as Dasatinib Drug Delivery Vehicle to Treat Proliferative Vitreoretinopathy

Taylor Roland¹, Betty Nunn¹, Rajat Chauhan¹, Martin O'Toole¹, and Shigeo Tamiya¹
¹University of Louisville, Louisville, KY

SAT-516

Modulation of Neural Activity Via On-Demand Magnetothermal Drug Release

Valeria Juarez¹, Rohini Thevi. G. V.¹, and Gabriela Romero Uribe¹
¹University of Texas at San Antonio, San Antonio, TX

SAT-517

PLGA-Ce Nanoparticles: Synthesis, Characterization, and Antioxidative Activity

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SAT-518

Rational Design of Nanoparticle Morphology and Surface Charge for Targeted Cellular Delivery

Yufan Yang¹, Nicholas Karabin¹, Sharan Bobbala¹, and Evan Scott¹
¹Northwestern University, Evanston, IL

SAT-519

Investigating the Effects of Two Potential Anti-tumor Drugs on Angiogenesis

Zeal Jinwala¹ and David Haruch¹
¹Drexel University, Philadelphia, PA

SAT-520

Optimization of Poly(beta-amino ester)/Poly(D,L-lactic acid)-Hyperbranched Polyglycerol Nanoparticles for Single-Stranded DNA Delivery

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Track: Undergraduate Research & Design

Nano to Micro Technologies

SAT-521

Surface Nanomodification Processing to Enhance Iridium Oxide pH Sensors

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SAT-522

Developing a Stimuli-Responsive Carrier That Responds to Bioactive Lipids

Claire Hilburger¹, Kamryn Lewis¹, and Neha Kamat¹
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SAT-523

Investigating Therapeutic Potential of Cerium Oxide Nanoparticles in Age-Related Macular Degeneration

Corbin Mathews¹, Bruce Corliss¹, Paul Yates¹, and Shayn Peirce-Cottler¹
¹University of Virginia, Charlottesville, VA

SAT-524

Design and Characterization of Asymmetrical Nanoparticles for Theranostics

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¹University of Virginia, Charlottesville, VA

SAT-525

Effects on Cell Swimming of Acoustic Trap-and-Release for Measurement of Cell Motility

Emma Huff¹, Minji Kim¹, Mathieu Bottier¹, Philip V. Bayly¹, and J. Mark Meacham¹
¹Washington University in St. Louis, St. Louis, MO

SAT-526

Low-Cost Separation of Malaria-Infected Red Blood Cells Through Paramagnetic Exposure

Eugene Kim¹, Ashlee Colbert¹, Jacqueline Linnes¹, and Tamara Kinzer-Ursem¹
¹Weldon School of Biomedical Engineering, Purdue University, West Lafayette, IN

SAT-527

Hemocompatibility Testing of Graphene Oxide Nanolaminates

Hayley Miller¹, Henry Chung¹, Richard Rode², Saeed Moghaddam², and Thomas Gaborski¹
¹Rochester Institute of Technology, Rochester, NY, ²University of Florida, Gainesville, FL

SAT-528

Effect of Immobilization of Fibronectin and Collagen on the Cellular Functions of poly-ε-caprolactone

Helga Progrri¹, Niyaf Alkadhém¹, Fariha Sultana¹, Melville Vaughan¹, and Morshed Khandaker¹
¹University of Central Oklahoma, Edmond, OK

SAT-529

Microneedle Fabrication Using Tilted and Rotational UV Lithography

Hima Patel¹, Khanh Tran¹, and Thanh Nguyen¹
¹University of Connecticut, Storrs, CT

SAT-530

Point of Infection Detection of the Wheat Streak Mosaic Virus

Hunter Stevenson¹, Varsha Thomas², and Shalini Prasad¹
¹University of Texas at Dallas, Richardson, TX, ²University of Texas at Dallas, Plano, TX

SAT-531

Microfluidic Generation of Droplets for the High-Throughput Study of Virus-Host Interactions

Isabel Navarro¹, Jasmine Shirazi¹, Brian Chambers¹, Marcie Marston², and Jason Gleghorn¹
¹University of Delaware, Newark, DE, ²Roger Williams University, Bristol, RI

SAT-532

Investigation of Ability of Photothermal Treatment with PEDOT NPs to Lead to Immunogenic Cell Death

Jessica Barrera¹, Madeline Huff¹, Tania Betancourt¹, Susana Torres Hurtado², and James Tunnell²
¹Texas State University, San Marcos, TX, ²The University of Texas at Austin, Austin, TX

SAT-533

Bonding of Non-Elastomeric Materials to Engineer Resealable and Reusable Microphysiological Systems

Jordan Hill¹, Matthew Ishahak¹, Ahmad Alassaf¹, Siddarth Rawal¹, and Ashutosh Agarwal¹

¹University of Miami, Coral Gables, FL

SAT-534

Nanoparticle Separation Using Magnetic Force in a Ferrofluidic System

María Del Mar Zayas-Viera¹, Yang Liu², and Leidong Mao²

¹University of Puerto Rico, Mayaguez, Puerto Rico,

²University of Georgia, Athens, GA

SAT-535

A Microfluidic Tissue Chip for Modeling Spatial Heterogeneity in Human Organ Fibrosis

Matthew Osborn¹, Yoon-Suk Yi¹, Mark Mondrinos¹, and Dongeun Huh¹

¹University of Pennsylvania, Philadelphia, PA

SAT-536

Frame Method: Fabrication of Biaxial Fibers by Electrospinning

Natalie Mueller¹, Matthew Brown², and Ahyeon Koh²

¹Louisiana Tech University, Ruston, LA, ²State University of New York at Binghamton University, Binghamton, NY

SAT-537

Developing a Passively-Driven Storage Platform for Droplet-Based Microfluidic Virology Experiments

Olivia Powell¹, Ali Bozorgnezhad¹, Brian Chambers¹, Sunil Narayan¹, K. Eric Wommack¹, and Jason P. Gleghorn¹

¹University of Delaware, Newark, DE

SAT-538

Detecting DNA Methylation with Methyl-Binding Proteins and Using Nanopore Technology

Olivia Sergent¹, Julian Bello¹, and Jiwook Shim¹

¹Rowan University, Glassboro, NJ

SAT-539

Characterization of a Lipid Bilayer Using Droplet Interface Technique

Oluchi Ozuzu¹, Joyce El-Beyrouthy², and Eric Freeman²

¹North Carolina Agricultural and Technical State University, Greensboro, NC, ²University of Georgia, Athens, GA

SAT-540

Accuracy and Scalability of Two-Photon Polymerization with Varying Objectives and Power

Oreoluwa Odeniyi¹

¹University of Pittsburgh, Poughkeepsie, NY

SAT-541

Assessing the Effect of Heparin-Coated Magnetic Nanoparticles on Human Endothelial Cells

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¹SC Governor's School for Science and Mathematics, Hartsville, SC,

²Clemson University, Clemson, SC

SAT-542

Photothermal and Photodynamic Cancer Therapy with Nanoshells and Biladiene-Based Photosensitizers

Rachel O'Sullivan¹, Rachel Riley¹, Andrea Potocny¹, Joel Rosenthal¹, and Emily Day¹

¹University of Delaware, Newark, DE

SAT-543

Toxicity of Carbon Nanotube Adsorbed Silk Membranes Against Pseudomonas aeruginosa

Serena Omo-Lamai¹, Mostafa Bedewy², and Tagbo Niepa²

¹Syracuse University, Syracuse, NY, ²University of Pittsburgh,

Pittsburgh, PA

SAT-544

Design of a Microfluidic Oviduct Model to Test Sperm Sensitivity to Chemical Gradients

Serena Russell¹, Sampath Rachakonda¹, Joshua Hall¹, and Juan Jiménez¹

¹University of Massachusetts, Amherst, Amherst, MA

SAT-545

Microfluidic System for Generating Oxygen Gradients to Validate Phosphorescence Imaging

Victoria Palmer¹, Arya Chowdhury Mugdha¹, Saurabh Gupta¹,

Jesse Wilson¹, and Kevin Lear¹

¹Colorado State University, Fort Collins, CO

SAT-546

Interaction Between T-Cells and Glioma Stem Cells In Microfluidic Devices

Yasmine Stewart^{1,2}

¹Savannah State University, Savannah, GA, ²University of Georgia,

Athens, GA

SAT-547

Application of Method for Reuse of Patch Pipettes to Planar Patch Clamp Arrays

Yi Wu¹, Corey Landry¹, Wen Yu Gu^{1,2}, Bo Yang¹, Amanda Felouzis¹, and Craig Forest¹

¹Georgia Institute of Technology, Atlanta, GA, ²Peking University,

Beijing, China, People's Republic of

SAT-548

Micro-engineered Platform Designed to Develop a Blood-Brain Barrier Model

Yujung Ryu¹, Song Ih Ahn¹, and YongTae Kim¹

¹Georgia Institute of Technology, Atlanta, GA

SAT-549

Analysis of Acoustofluidic Micropumps Fabricated Using a 3D Printer

Nicholas Panjwani¹, Hunter Bachman¹, Joseph Rufo¹, and

Tony Jun Huang¹

¹Duke University, Durham, NC

Track: Undergraduate Research & Design

Neural Engineering

SAT-556

Development of a Robotic System for Large-Scale Neural Section Processing for Serial Section Electron Microscopy

Aditi Kumar¹, Timothy Lee¹, and Craig Forest¹

¹Georgia Institute of Technology, Atlanta, GA

SAT-557

Effect of Dopant Concentration on *In Situ* Polymerization of Poly(3,4-ethylenedioxythiophene) (PEDOT) in Central Nervous System

Adrienne Widener¹, Jamie Murbach¹, and Kevin Otto¹
¹University of Florida, Gainesville, FL

SAT-558

The Response of Schwann Cells to Weak DC Electric Fields

Alexander Lai¹, Spencer Bunn¹, and Jianming Li¹
¹Purdue University, West Lafayette, IN

SAT-559

Characterization of Tissue Response in Rodent Spinal Cords by Immunofluorescence Staining

Alexandra Liberti¹, Martin Han¹, Nicholas Nolta¹, and Aparna Nambiar¹
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SAT-560

Assembly of Compact Neurostimulator Circuit Board for Neuroprosthetic Applications

Amanda Johnson¹, Alpaslan Ersoz¹, and Martin Han¹
¹University of Connecticut, Storrs, CT

SAT-561

Effects of Protein Adsorption on Titanium Nitride Electrodes

Anastasia Valimaki¹, Kaitlynn Olczak¹, and Kevin Otto¹
¹University of Florida, Gainesville, FL

SAT-562

The Effects Of Vagal Nerve Stimulation On Degeneration Of The Substantia Nigra In A Rat Model Of Parkinson's Disease

Andrew Rios¹, Jeffrey Kleim², and Stephen Lane²
¹The University of Texas at El Paso, El Paso, TX,
²Arizona State University, Tempe, AZ

SAT-563

Magnetically-Responsive Non-Viral Carriers for Brain Tumor Gene Therapy

Angela Michelle San Juan¹ and Gabriela Romero¹
¹University of Texas at San Antonio, San Antonio, TX

SAT-564

Foreign Body Response in the Peripheral Nervous System to Tissue-Engineered Electronic Nerve Interfaces (TEENIs)

Anne Gormaley¹, Eric Atkinson¹, Sahba Mobini¹, Paritosh Rustogi¹, Benjamin Spearman¹, Elizabeth Nunamaker¹, Carey Kuliasha¹, Jack Judy¹, Christine Schmidt¹, and Kevin Otto¹
¹University of Florida, Gainesville, FL

SAT-565

A Semi-automated Axon Segmentation Technique for a More Efficient Evaluation of Peripheral Nerves

Azante Griffith¹, X. Sally Zheng, MSE¹, and X. Tracy Cui, PhD^{1,2,3}
¹University of Pittsburgh, Pittsburgh, PA, ²Center for Neural Basis of Cognition, Pittsburgh, PA, ³McGowan Institute for Regenerative Medicine, Pittsburgh, PA

SAT-566

Computational Analysis of Spinal Cord Stimulation Paradigms for Regaining Lower-Body Motor Control

Clayton Kettlewell^{1,2}, Julia Slopsema¹, Lauren R Madden¹, David P Darrow¹, Theoden I Netoff¹, and Matthew Johnson¹
¹University of Minnesota, Minneapolis, MN, ²University of Missouri, Kansas City, MO

SAT-567

Computational Analysis of Neural Activity Recorded during Subthalamic Nucleus Deep Brain Stimulation in a Rat Model of Parkinson's Disease

Daniel Carbonero¹, Karthik Kumaravelu², and Warren M. Grill²
¹University of Miami, Coral Gables, FL, ²Duke University, Durham, NC

SAT-568

Selective Attention and Identifications of Arithmetic Incongruences in Visual and Auditory Tasks

David Hughes¹, Stefanie Panzenhagen¹, Changlin Shen¹, Megan Baker¹, Brittany Clark¹, and Alan Chiu¹
¹Rose-Hulman Institute of Technology, Terre Haute, IN

SAT-569

Gait Outcome after Repetitive Mild Traumatic Brain Injury Varies by Sex

Delaney Beckner¹, Kyle Milligan¹, Michael Assan¹, and Michelle LaPlaca¹
¹Georgia Institute of Technology, Atlanta, GA

SAT-570

Effects of BACE Inhibitors on Alzheimer's Disease Cognition

Elizabeth Wright¹, Kathleen Jordan¹, and Cassie Mitchell²
¹Georgia Institute of Technology, Atlanta, GA, ²Georgia Institute of Technology & Emory University, Atlanta, GA

SAT-571

The Role of Glial Density On Ca⁺⁺ Mediated Events In Brain Cell Networks

Hunter Rasnic¹, Kevin Holly¹, Samuel Clary¹, Noah Hutson¹, Leonidas Iasemedis¹, Mark DeCoster¹, and Levi Good¹
¹Louisiana Tech University, Ruston, LA

SAT-572

High-Density EMG And Mapping Of Forearm Muscle Activity in Stroke and Neurologically-Intact Subjects

Jennifer Mak¹, Ernesto Bedoy², Mike Urbin², and Douglas Weber²
¹Virginia Commonwealth University, Richmond, VA, ²University of Pittsburgh, Pittsburgh, PA

SAT-573

Behavioral Evidence for Neural Integration in the Control of Reaching and Holding

Jihoon Jang¹, Scott Albert¹, and Reza Shadmehr¹
¹Johns Hopkins University, Baltimore, MD

SAT-574

On Development of a Mind-controlled Wheelchair for Brain Injury Rehabilitation

Xiaopeng Zhao¹, Jinxiao Yu¹, and Jackson Mayfield¹
¹University of Tennessee, Knoxville, Knoxville, TN

SAT-575

Understanding Changes in Local Field Potentials Using Electrode-Tissue Interface Modeling

Joseph Alisch^{1,2}, Annie Brinda², Alex Doyle², Lucius Wilmerding², Jordan Krieg², and Matthew Johnson²
¹Providence College, Providence, RI, ²University of Minnesota, Minneapolis, MN

SAT-576

A Fast Linear Approximation Model to Predict Action Potentials in Sensory Axons

Joshua Rosenberg¹, Olivier Izad², and Matthew Schiefer^{1,3}
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SAT-577

Cellular Deficits in a Combined Model of Blast and Blunt Traumatic Brain Injury

Julianna Kosty¹, Aswati Aravind¹, Venkata Kakulavarapu¹, Maciej Skotak¹, Eren Alay¹, Namas Chandra¹, and Bryan Pfister¹
¹New Jersey Institute of Technology, Newark, NJ

SAT-578

Cortical Mapping of Hindlimb Muscle Neural Circuitry in the Mouse

Katherine Rohde¹ and Christi Kolarcik¹
¹University of Pittsburgh, Pittsburgh, PA

SAT-579

Histology and Immunohistochemistry to Study Epileptic Rat Brain

Kayla Ponder¹, Jessica Landry¹, Jihane Ait Samo¹, and Teresa Murray¹
¹Louisiana Tech University, Ruston, LA

SAT-580

Intracellular Calcium and Mitochondrial Dynamics in Confined Environments

Kendra Hergett¹, Connor Beck¹, and Anja Kunze¹
¹Montana State University, Bozeman, MT

SAT-581

Silk Fibroin as a Biodegradable, Biocompatible Adhesive for Electrode Implantation

Kendrick Lim¹, Matthew Hogan², and Philip Horner²
¹Texas A&M University, College Station, TX, ²Houston Methodist Research Institute, Houston, TX

SAT-582

Recessed Array Electrode Geometries for Directional Deep Brain Stimulation

Kyle Ondar¹, Shruthi Radhakrishnan¹, and Xuefeng Wei¹
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SAT-583

Modulating RAGE Expression in Alzheimer's Disease with qn Achiral Peptoid Therapeutic

Lauren Phillips¹, Lauren Wolf¹, and Melissa Moss¹
¹University of South Carolina, Columbia, SC

SAT-584

Evoked Referred Sensations through Quadripolar Transcutaneous Electrical Neurostimulation

Luis Herran¹, Andres Pena¹, and Ranu Jung¹
¹Florida International University, Miami, FL

SAT-585

A 3D-printed Jig for Standardized, Cost-effective Construction of Extraneural Cuff Electrodes

Luis Ruiz¹, Eric Sallinger¹, Nikhil Chandra¹, Wilson Ray², and Matthew MacEwan²
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SAT-586

Effect of Buffer Environment on Orb2A Protein Aggregation

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SAT-587

Causality of Baseline and Post-Injury Neuron-Astrocyte Signaling

Margaret Schroeder¹
¹University of Pennsylvania, Philadelphia, PA

SAT-588

Mosquito Inspired Insertion Strategy to Improve Microelectrode Implantation

Marina Yu¹, Rachel Welscott², Seth Meade¹, Carmen Toth¹, Andrew Shoffstall¹, and Jeffrey Capadona¹
¹Case Western Reserve University, Cleveland, OH, ²Vanderbilt University, Nashville, TN

SAT-589

Combining Convolutional Neural Networks with Cognitive Models to Predict Novel Objects Recognition in Humans

Matthew Seh¹, Jeff Annis¹, and Thomas Palmeri¹
¹Vanderbilt University, Nashville, TN

SAT-590

Biomechanics of a Preclinical Model of TBI Heterogeneity

Michael Assan¹, Kyle Milligan¹, and Michelle LaPlaca¹
¹Georgia Institute of Technology, Atlanta, GA

SAT-591

Organotypic Hippocampal Slice Cultures as a Mode of Posttraumatic Epileptogenesis

Monika Buczak¹, Shabnam Ghiasvad¹, and Yevgeny Berdichevsky¹
¹Lehigh University, Bethlehem, PA

SAT-592

Optimizing Polyimide Thickness for Ultra-Thin μ ECoG Arrays

Mostafa Meselhe¹, Ashley Williams², and Jonathan Viventini²
¹Tulane University, New Orleans, LA, ²Duke University, Durham, NC

SAT-593

Comparing EMG- and Goniometer-Driven NMI Control for a Virtual Target Acquisition Task

Nicole Kowalski¹ and Dustin Crouch¹
¹University of Tennessee, Knoxville, TN

SAT-594

Directed Differentiation of V1 Interneurons from Mouse Embryonic Stem Cells

Oliver Zhao¹, Nicholas White¹, and Shelly Sakiyama-Elbert¹
¹The University of Texas at Austin, Austin, TX

SAT-595

Painful Nerve Root Injury Increases Neuronal Activity in the Primary Somatosensory Cortex & Anterior Cingulate Cortex

Patrisia De Anda¹, Julia Quindlen-Hotek¹, Alexander Kent², Sonia Kartha¹, and Beth Winkelstein¹
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SAT-596

Correlating Autophagic Behavior to Lysosomal Hydrolase Upregulation for Diagnostics in Lysosomal Storage Disease

Sarah Smith¹ and Jessica Kelly¹
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SAT-597

Recessed Curvature-Contact Electrode to Minimize Tissue Damage in Deep Brain Stimulation

Shruthi Radhakrishnan¹, Kyle Ondar¹, and Xuefeng Wei¹
¹The College of New Jersey, Ewing, NJ

SAT-598

Evaluating Axonal Projections of Regionalized Human Motor Neurons in the Developing Chick Embryo

Stephanie Cuskey¹, Nisha Iyer^{1,2}, Kurt Weiss³, Nikolai Fedorchak², Jan Huiskens³, and Randolph Ashton^{1,2}
¹University of Wisconsin-Madison, Madison, WI, ²Wisconsin Institute for Discovery, Madison, WI, ³Morgridge Institute for Research, Madison, WI

SAT-599

Extracellular Matrix Based Hydrogel for Peripheral Nerve Crush Injury

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¹University of Pittsburgh, Pittsburgh, PA

Track: Undergraduate Research & Design

Orthopaedic and Rehabilitation Engineering

SAT-601

Mammalian Cells Injected into Lizard Tails Survive and Reconstitute Regenerated Tissues

Sara Kenes¹, Christian DeMoya¹, Ricardo Londono¹, Megan Hudnall¹ and Thomas Loziti¹
¹University of Pittsburgh, Pittsburgh, PA

SAT-602

Comparing Wound Repair Mechanisms in Super Healing Mice

Ashley Martier¹, Thomas Lozito¹, Ricardo Londono¹, Megan Hudnall¹, Sean Tighe¹, and Danielle Danucalov¹
¹University of Pittsburgh, Pittsburgh, PA

SAT-603

Production of Hydrogen Peroxide on Orthopedic Implant Biomaterials for Controlling Biofilm Growth

Brandon Ruzala¹, Caelen Clark¹, and Mark Ehrensberger¹
¹SUNY University at Buffalo, Buffalo, NY

SAT-604

Predicting Vertical Ground Reaction Forces During Jumping from Wearable Sensor Data

Brett Meyer¹, Stephen Cain², Noel Perkins², and Ryan McGinnis¹
¹University of Vermont, Burlington, VT, ²University of Michigan, Ann Arbor, MI

SAT-605

Quadruped Gait Disturbances Associated with Lubricin (PRG4) Deficiency

Daniel Yang^{1,2}, Edward Dickerson³, Naga Padmini Karamchedu¹, and Gregory Jay^{1,2}
¹Brown University/Rhode Island Hospital, Providence, RI, ²Brown University, Providence, RI, ³North Carolina A&T State University, Greensboro, NC

SAT-606

Neural Stem Cell Proliferation in the Secondary Neural Tube for Lizards versus Mice

Danielle Danucalov¹, Thomas Lozito¹, Ricardo Londono¹, Megan Hudnall¹, Sean Tighe¹, Ashley Martier¹, and Christian DeMoya¹
¹University of Pittsburgh, Pittsburgh, PA

SAT-607

Attachment of Fibronectin with Titanium by Tresyl Chloride Activation Method: Chemical and Cell Analysis

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SAT-608

Photobiomodulation of Mouse Achilles Tendon Structure and Mechanics During Maturation

Ellen Dudzinski¹, Ryan Locke¹, Elisabeth Lemmon¹, and Megan Killian¹
¹University of Delaware, Newark, DE

SAT-609

Design of an Ergonomic Drive System for a Folding Wheelchair

Emily Hein^{1,2}, Greg Voss², Andrew Hansen^{1,2}, and Gary Goldish²
¹University of Minnesota, Minneapolis, MN, ²Minneapolis VA Health Care System, Minneapolis, MN

SAT-610

Proteoglycan Removal by Chondroitinase Enhances Adhesion of Collagen to Annulus Fibrosus

Emily Jiang¹, Stephen Sloan¹, and Lawrence Bonassar¹
¹Cornell University, Ithaca, NY

SAT-611

Age-Dependent Changes in the Orientation and Shape of the Anterior Cruciate Ligament Bundles

Emily Lambeth¹, Stephanie Cone¹, Lynn Fordham², Jorge Pedrahit¹, Jeffrey Spang², and Matthew Fisher¹
¹North Carolina State University, Raleigh, NC, ²University of North Carolina-Chapel Hill, Chapel Hill, NC

SAT-612

Morphogenesis of Digit Tip Regeneration in the Adult Mouse

Feini Qu^{1,2}, Ilan Palte^{1,2}, and Farshid Guilak^{1,2}
¹Washington University in St. Louis, St. Louis, MO, ²Shriners Hospital for Children – St. Louis, St. Louis, MO

SAT-613

Analysis of Braking Force and Reaction Time Data of Healthy Subjects

Graeme Bazarian¹, Kefan Song¹, and Eric Kennedy¹
¹Bucknell University, Lewisburg, PA

SAT-614

The Design and Fabrication of a Modular Low Profile Dual Flow Bioreactor with a Porous Membrane

Ian Moran¹ and Peter Alexander¹
¹University of Pittsburgh, Pittsburgh, PA

SAT-615

Development and Validation of a Braking Force Assessment Device for Lower Extremity Trauma Patients

Kefan Song¹, Graeme Bazarian¹, Eric Kennedy¹, Phillip Amarante¹, Ridhi Sahani¹, Daniel Horwitz², and Daniela Sanchez Morales²
¹Bucknell University, Lewisburg, PA, ²Geisinger Health System, Danville, PA

SAT-616

Characterization of OA Progression in Male vs. Female Lewis Rats

Krishna Pucha¹, Jay Mckinney², and Nick Willett^{2,3}
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SAT-617

Changes in Bone Geometry Caused by Disruption of the Gut Microbiome Depend on Stage of Skeletal Growth

Laura Vasquez-Bolanos¹, Marysol Luna¹, and Christopher Hernandez¹
¹Cornell University, Ithaca, NY

SAT-618

Suture Techniques in ACL Reconstruction: A Bio-mechanical Comparison and Cost Analysis

Matthew Johnson¹
¹University of South Alabama, Mobile, AL

SAT-619

Hierarchical Bundling Techniques with Polymer Nanofibers for Orthopedic Applications

Maura Francis¹, Jared Posselt², David Brennan¹, Christopher Wagner², and Vince Beachley¹
¹Rowan University, Glassboro, NJ, ²The College of New Jersey, Ewing, NJ

SAT-620

Isolation and Comparison of Mouse and Lizard Macrophages

Megan Hudnall¹, Thomas Lozito¹, Ricardo Londono¹, Megan Hudnall¹, Ashley Martier¹, and Danielle Danucalov¹
¹University of Pittsburgh, Pittsburgh, PA

SAT-621

Device for Arm Motion Analysis to Investigate Soft Tissue Tearing in Sports Injuries

Olivia Newkirk¹, Michael Maggio¹, Melissa Judge¹, Tyler Harvey¹, and Delphine Dean¹
¹Clemson University, Clemson, SC

SAT-622

The Potential for Plant-Based Compounds to be Used as an Injection Therapy for Osteoarthritis

Paulino Jarquin¹, Steve Elder², and Andrea Chironis³
¹Mississippi State University, Starkville, MS, ²Mississippi State University, Mississippi State, MS, ³Northwestern University, Evanston, IL

SAT-623

Metformin Exhibits Anti-inflammatory Properties by Suppressing Catabolic Gene Expression Within the Intervertebral Disc

Rahul Ramanathan¹, Nam Vo¹, and Gwendolyn Sowa¹
¹University of Pittsburgh, Pittsburgh, PA

SAT-624

Hyaluronic Acid Induces Microvesicle Shedding in Synovial Joint Cells

Rose Yin¹, LaDeidra Roberts¹, Joe Kuo¹, Bridgette Peal¹, Jin Su¹, Matthew Paszek¹, and Heidi Reesink¹
¹Cornell University, Ithaca, NY

SAT-625

Creating a Framework for Making a Robotic Arm Act Like a Physics-Based Simulation of a Human Arm

Sarah Castillo¹ and Eric Scheerer²
¹University of Notre Dame, Notre Dame, IN, ²Cleveland State University, Cleveland, OH

SAT-626

Pressure-Sensing Insole to Detect Posture Imbalances for High-Heeled Shoes

Stephanie Reynolds¹, Benjamin Banaszak¹, Whitney Schroeder¹, Hetal Maharaja¹, and Jordon Gilmore¹
¹Clemson University, Clemson, SC

SAT-627

Design and Development of an Ergonomic Hand Held Muscle Dynamometer

Thomas Reina¹, Joshua Myszewski¹, Eric Bergendahl¹, Mohammad Rahman¹, and Ying-Chih Wang¹
¹University of Wisconsin Milwaukee, Milwaukee, WI

SAT-628

Grasp Taxonomy of 3D Printable Prosthetic Hand Designs

Viktoria Yakonska¹
¹Florida Gulf Coast University, Fort Myers, FL

SAT-629

The Design and Fabrication of a Modular Low Profile Dual Flow Bioreactor With a Porous Membrane

Ian Moran¹ and Peter Alexander¹
¹University of Pittsburgh, Pittsburgh, PA

SAT-630

Reduced Epiphyseal Porosity in the Femoral Head of a Sicklet Cell Transgenic Mouse Model

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¹Georgia Institute of Technology and Emory University, Atlanta, GA

Track: Undergraduate Research & Design

Respiratory Bioengineering

SAT-657

Dissection Technique for Studying Structure-Function Relationship of the Extracellular Matrix of Human Airways

Alison Kahn^{1,2}, Jessica Peura³, Ethan John⁴, Robert Pouliot², and Daniel Weiss²

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SAT-658

Improving Quality of Respiratory Mechanical Impedance Measurements and Comparison to Spirometry and Multibreath Washout In Preschool Children With Wheeze

Erin Gillis¹, Jonathon Tjong¹, Stephanie DeLorenzo², Vera Dai², Aimee Dubeau², Graham Hall³, Padmaja Subbarao², Geoff Maksym¹, and Rachel Foong³

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SAT-659

Investigating Photo-Initiator Cytotoxicity in a ECM-Polymer Composite Substrate with Tunable Mechanical Properties

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SAT-660

Role of Endothelial Soluble Factors in Ventilator Induced Injury to the Lung Epithelium

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SAT-661

Analysis of the Effects of E-Fluids on Cultured Lung Cells

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SAT-662

A Novel Approach to Native Alveolar Basement Membrane Extraction for Cell Culture

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SAT-663

Effect of Pivot-Bearing Surface Roughness on Thrombus Formation: An In-Vitro Study

Katherine Stevenson¹, Alexandra May^{1,2}, Ryan Orizondo^{1,2}, Brian Frankowski², William Wagner^{1,2}, and William Federspiel^{1,2}

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SAT-664

Characterization of Blood Temperature Changes within a Wearable Artificial Lung

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SAT-665

Investigating the Role of Extracellular Matrix Proteins on the Mechanics of the Neonatal Mouse Lung

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SAT-666

The Impact of Aging on Macrophage Polarization in Experimental Ventilator-Induced Lung Injury

Manav Parekh¹, Michael Valentine¹, Franck Kamga Gninzeko¹, and Rebecca Heise¹

¹Virginia Commonwealth University, Richmond, VA

SAT-667

Pressure Evaluation of Tracheal Suction Catheters to Reduce Damage to Respiratory Airways

Marcus Moody¹, Stephanie George¹, and Veeranna Maddipati¹

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SAT-668

A Microfluidic Ex Vivo Lung Culture Platform to Study Neonatal Ventilator-Induced Lung Injury

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SAT-669

The Effects of Fibronectin on Epithelial Barrier Formation and Sustainability in Decellularized Lungs

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Track: Undergraduate Research & Design

Stem Cell Engineering

SAT-670

Modeling Pearson Marrow Pancreas Syndrome Using Human Induced Pluripotent Stem Cells (iPSCs) Harboring Mitochondrial DNA Deletions

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SAT-671

Engineered Live Three-Dimensional Spark-Cell Spheroids for Optical Pacing

Christianne Chua¹, Julie Han², Weizhen Li², and Emilia Entcheva²

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SAT-672

Tracking Morphogenesis of 3D Pluripotent Stem Cell Aggregates

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SAT-673

Optimizing Human Amnion Epithelial Cell Proliferation for Cell Therapy

Julie Leonard-Duke^{1,2}, Oula Khoury¹, and Sean Murphy¹

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SAT-674

Determining the Effectiveness of High v. Low Passage MSCs

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SAT-675

Human Intestinal Stem Cell Morphogenesis in a 2.5D System Allows Formation of Crypt-like Structures

Kalon Overholt¹, Arinola Lampejo², Timothy Kassis²,

Victor Hernandez-Gordillo², and Linda Griffith²

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SAT-676

Expansion and Characterization of Human Induced Pluripotent Stem Cell Derived Pericytes

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SAT-677

Combined Neural Stem Cells and Physical Therapy Improve Somatosensory Cortex Activity After Stroke

Nikhita Perry¹, Harman Ghuman¹, Lauren Grice¹, Franziska Nitzsche¹,

Madeline Gerwig¹, Jeffery Moorhead¹, Alex Poplawsky¹,

Brandon Wahlberg¹, Michel MODO¹, and Fabrisia Ambrosio¹

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SAT-678

Effect of Conditioned Media on Wound Driven Cellular Migration

Shannon Gulvin¹, Mehdi Dehghani¹, Henry Chung¹, and

Thomas Gabroski¹

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SAT-679

Improvement of Mesenchymal Stem Cell Osteogenesis

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Luke Mortensen^{2,3}

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SAT-680

Using HR-MAS to Generate Real Time Data for Mesenchymal Stem Cells

Tamera Jones¹, Xunan Shen², Austin Passaro², Steve Stice², and

Arthur S. Edison²

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SAT-681

The Role of O-GlcNAcylation in YAP Nuclear Localization with Increasing Substrate Stiffness

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SAT-682

Osteoinductive Effect of Vitamin D3 on Adipose-Derived Stem Cell Differentiation

Thomas Bane¹, Marcello Rubessa¹, Joshua Bertels¹, Kathryn Polkoff¹,

and Matthew Wheeler^{1,2}

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SAT-683

Modeling Multi-Lineage Human Development Via Pluripotent Stem Cell Differentiation

Tyler Lent¹, Daniella McDonald², and Prashant Mali²

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Track: Undergraduate Research & Design

Tissue Engineering

SAT-685

Developing Physiologically Relevant *In Vitro* Models for Cardiac and Pulmonary Fibrosis

Akinola Akinbote¹, Roger Kamm², and Kristina Haase²

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SAT-686

Biomanufacturing of Human Cell-Derived Matrices for Wound Healing Applications

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SAT-687

Tissue Engineered Bone-Tendon Enthesis via Spatiotemporal Delivery of Growth Factors

Amelia Hurlley-Novatny¹, Navein Arumugasaamy¹, Megan Kimicata¹,

Sarah Van Belleghem¹, Hannah Baker¹, and John Fisher¹

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SAT-688

Characterization of Extracellular Matrix Deposited by Human Mesenchymal Stem Cell Derived Osteoblasts

Amy Verghese¹, Vera Mayo¹, and Ashutosh Agarwal¹

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SAT-689

Modeling Lymphangiogenesis on a Lymphatics-on-a-Chip Microfluidic Device

Anagha Krishnan¹, Michael Nelson¹, Alexandra Atalis¹, and Krishnendu Roy¹
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SAT-690

3D Perfusion of Alginate Microbeads for Vascularization of Thick Liver Tissue

Athenia Jones¹, Jenny Katsnelson¹, Daniel Najafali¹, Daniel Rivkin¹, Alexis Robinson¹, Bhushan Mahadik¹, Charlotte Piard¹, and Guang Yang¹
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SAT-691

inCITE Optical Tissue Clearing is Compatible with Post Processing and does not Impact Tissue Architecture and ECM Organization

Boeun Hwang¹, Robert Masi², Lysette Mutkus³, Kristina Stumpf³, and Frank Marini³
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SAT-692

Developing a Platform for Visualizing Cyclic AMP Signaling Dynamics During Stromal Tissue Gap Closure

Bonnie Walton¹, Breanna O'Reilly¹, and Allyson Sgro¹
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SAT-693

Perfusable 3D Model of Brain Microvasculature

Callie Weber^{1,2}, Kylie Balotin³, Shannon Faley⁴, Ethan Lippmann^{1,3}, and Leon Bellan^{1,4}
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SAT-694

Scaffold-Free 3D Fibroblast Spheroid Model for Nanomaterial Toxicity Testing

Charlotte Merzbacher¹, Alysha Simmons^{1,2,3}, Agnes Kane^{2,3}, and Ian Wong^{1,3}
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SAT-695

Development of a 3D Biphasic Osteochondral Model for In Vitro Osteoporosis Drug Discovery

Christopher Snodgrass¹, Vincenzo Garofalo², Alireza Khalajzadeh³, Peter Alexander¹, Rocky Tuan^{1,4}, and Riccardo Gottardi¹
¹University of Pittsburgh, Pittsburgh, PA, ²Università degli Studi di Palermo, Palermo, Italy, ³Politecnico di Milano, Milan, Italy, ⁴Chinese University of Hong Kong, Shatin, Hong Kong

SAT-696

Exposure to Tobacco or Electronic Cigarettes Inhibits Murine Digit Regeneration

Cynthia Rishi¹, Jefferson Overlin¹, and Rene Olivares-Navarrete¹
¹Virginia Commonwealth University, Richmond, VA

SAT-697

Effects of the Human Placental Matrix and Culture Conditions on Chondrogenesis in Mesenchymal Stem Cells

Dayita Wable¹, Olivia Lanier¹, Adam Monsalve¹, Sridevi Conjeevaram¹, Jon Dobson¹, and Peter McFetridge¹
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SAT-698

Regenerating the Endothelial Glycocalyx

Dominique Petach¹ and Xi Ren¹
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SAT-699

Aged Muscle ECM Impairs Macrophage Infiltration and Activation During Muscle Injury

Edward-James Gardner¹, Samuel LoPresti¹, and Bryan Brown¹
¹University of Pittsburgh, Pittsburgh, PA

SAT-700

Functional Mapping of Matrix Changes in Osteoarthritic Human Osteochondral Tissue

Elisa Fang¹, Christopher Mosher¹, Yizhong Hu¹, Edward Guo¹, Stephen Doty², and Helen Lu¹
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SAT-701

Establishing a Baseline to Investigate the Effect of SNPs on Tissue Engineered Blood Vessel Function

Elizabeth Snyder-Mounts¹, Leigh Atchison¹, and George A. Truskey¹
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SAT-702

Induction of Osteolytic Phenotype of Migrating Prostate Cancer Cells

Emily Hills¹, Tamara Hill¹, and Young-tae Kim¹
¹University of Texas at Arlington, Arlington, TX

SAT-703

Immersion Bioprinting Organoids in Multi-Well Plates for Increasing Throughput of 3D Drug Screening

Erin Maloney¹, Casey Clark², Andrea Mazzocchi², and Aleksander Skardal²
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SAT-704

Modulating Electrospun Nanofiber Orientation across the Thickness of Blood Vessel Bioscaffolds

Gabriel Valdez-Cagua¹ and Justin L. Brown²
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SAT-705

Altered Mice ECM Structure in the Absence of Laminin Alpha 4

Gabriela Martinez¹, Feipeng Yang², Katerina Stojkova¹, and Eric Brey^{1,3}
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SAT-706

Methods to Encapsulate Patient-derived Fibroblasts in Synthetic Extracellular Matrices for 3D *In Vitro* Intestinal Fibrosis Models

Hana Grubb¹, Rebecca Duffy², Alexander Brown², and Linda Griffith²
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SAT-707

Toward Monitoring the *In Vitro* Extracellular Matrix Remodeling of Tissue Engineered Vascular Grafts

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SAT-708

3D Bioengineered Model of Intestinal Immunity to Modulate Pathogen Transcytosis

Harry Paul¹, Terrence Roh¹, Ying Chen¹, and David Kaplan¹
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SAT-709

Controlled Deposition of Electrospun Nanofibers

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SAT-710

Bioengineered Topographical Scaffold for Muscle Regeneration

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SAT-711

The Effect of Vascularization on Adipose Tissue Glucose Metabolism

Jennifer Hammel¹, Golnaz Anvari¹, and Evangelia Bellas¹
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SAT-712

Skeletal Muscle Decellularization Strategies for ECM Hydrogel Preparation

Jocelyn S Baker¹, Malik J Snowden¹, Kristen I Byrd¹, Benjamin K Schilling, BS¹, and Kacey G Marra, PhD²
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²University of Pittsburgh Medical Center, Pittsburgh, PA

SAT-713

Characterizing Composite Pentanoate-Functionalized Hyaluronic Acid Scaffolds for Tissue Engineering

Josephine Hriscu¹, Omar Wyman¹, and Michael Detamore¹
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SAT-714

Effects of Varying Prostate Cancer to Fibroblast Cell Encapsulation Ratios on 3D Bioengineered Tumor Tissue Properties

Joshita Suresh¹, Nicole Habbit¹, Luke Anderson¹, and Elizabeth Lipke¹
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SAT-715

Lung Decellularization Methods Through Apoptosis

Kaitlyn Daramola¹, Daniel Visosevic¹, Stacy Porvasnik¹, Young Hye Song¹, and Christine Schmidt¹
¹University of Florida, Gainesville, FL

SAT-716

The Effect of Fiber Alignment on the Viability and Growth of Endothelial Cells

Katelyn Neuman¹, Vaughn Greene¹, and David Rubenstein¹
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SAT-717

Matrix Metalloproteinase Production by Stem Cells for Tendon Tissue Engineering

LeeAnn Hold¹, Sophia Theodossiou¹, and Nathan Schiele¹
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SAT-718

Development of a Dynamic 3D Blood Brain Barrier Model

Lillian Ekem¹, Hemamylammal Sivakumar¹, Charlotte Mae K. Waits¹, Aleksander Skardal¹, and Elaheh Rahbar¹
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SAT-719

Hydrogel Scaffolds with Tunable Dynamic Changes in Modulus and Proteolytic Degradation for Musculoskeletal Tissue Engineering

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SAT-720

Proteomic Analysis of Pancreatic Extracellular Matrix

Margaret Blystone¹, Deana Moffat¹, Huanjing Bi¹, Tchilabalo Alayi¹, Yetrib Hathout¹, Kaiming Ye¹, and Sha Jin¹
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SAT-721

Application of the Rat Mesentery Culture Model for Tracking Cell Dynamics During Angiogenesis in Adult Microvascular Networks

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SAT-722

Development of a Genetic Reporter System To Spatiotemporally Track Osteogenic Differentiation of Adipose-Derived Stem Cells In Response to Platelet-Derived Growth Factor-BB

Maya Lapinski¹, Alexandra Rindone^{1,2}, and Warren Grayson^{1,2,3}
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SAT-723

Comparison of Cell Seeding Quality of Porous, Biomimetic, Tubular Scaffolds for Vascular Tissue Engineering Fabricated by Two Different Methods

Meara Sedlak¹, Katherine Lorentz¹, Samuel Luketich^{1,2}, Sang-Ho Ye^{2,3}, Antonio D'Amore^{1,2,3}, William Wagner^{1,2,3,4}, Justin Weinbaum^{1,2,5}, and David Vorp^{1,2,3,4,6,7}

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SAT-724

Biomanufacturing Scaffolds for Articular Cartilage and Osteoarthritis Treatment

Monika Cewe¹, Paige Ford¹, and Arda Gozen¹

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SAT-725

CRISPR-Cas9 Gene Editing Improves Structure and Function of a Novel Human Tissue-engineered Model of Duchenne Muscular Dystrophy

Neel Prabhu¹, Alastair Khodabukus¹, Jacqueline Robinson-Hamm¹, Charles Gersbach¹, and Nenad Bursac¹

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SAT-726

Modulation of Covalently Crosslinked 3D Collagen Hydrogels Regulate Metabolic and Fibrotic Gene Expression

Nikolas Di Caprio¹ and Evangelia Bellas¹

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SAT-727

Effects of Fibroblast Donor Variability on *In Vitro* Vasculogenesis

Olivia Liseth¹, Joscelyn Mejias², Michael Nelson², Anagha Krishnan², Alexander Karius², and Krishnendu Roy²

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SAT-728

Development of 3D Conductive Microgrooved Scaffolds for Aligned Neurite Growth of Neural Stem Cells

Raina Mittal¹, Se-Jun Lee², Shida Miao², and Lijie Grace Zhang²

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SAT-729

Development of a Permissive Vascularized Scaffold for Spinal Cord Injury Repair

Sarah Lee¹ and Peter Galie²

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SAT-730

Use of Centrifugation to Generate Laminar Cell Sheets and Assemble Dense Scaffold-Free Multi-Laminar Tissues.

Shayla Goller¹, Uma Balakrishnan¹, and Lance Davidson¹

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SAT-731

Development and Characterization of Ovarian Tissue-derived Hydrogel Provides an Alternative Biomaterial for Fertility Preservation

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SAT-732

***In-Situ* Printing of Scaffolds for Skeletal Muscle Tissue Engineering**

Tyrell Williams¹, Carina Russell¹, Azadeh Mostafavi¹, Sam Gerdes¹, Zack Bonick¹, Saghi Saghazadeh², Prahalda Rao¹, Indranil Sinha², Sahar Salehi³, and Ali Tamayol¹

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SAT-733

Biomimetic *In Vitro* 2-D And 3-D Model to Study Cellular Migration and Barrier Properties of Vessels During Inflammation

Varnica Bajaj¹, Stella Alimpert^{2,3}, and Christopher Chen^{1,4}

¹Boston University, Boston, MA, ²American Dental Association, Washington, DC, ³National Institute of Standard and Technology, Gaithersburg, MD, ⁴Wyss Institute for Biologically Inspired Engineering, Harvard Medical School, Boston, MA

SAT-734

The Influence of Macrophages on Ovarian Cancer Spheroid Disaggregation During Metastasis on the Omentum

William Olson¹, Kaitlin Fogg¹, and Pamela Kreeger¹

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SAT-735

***In Vitro* Modeling of Osteoarthritis using iPSC-Derived Microphysiological Osteochondral Complex**

Xinyu Li¹, Zixuan Lin¹, Hang Lin¹, and Rocky Tuan¹

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SAT-736

Laminin Assembly on Pancreatic Islets Improves Cytocompatibility of Conformal Polymer Coatings

Yarelis Gonzalez-Vargas^{1,2}, Nicholas J Abuid², Matthew W Becker², Kerim M Gattás-Asfura², Jennifer A Simonovich², Cherie L Stabler², and Edward A Phelps²

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Track: Undergraduate Research & Design

Translational Biomedical Engineering

SAT-737

Biocompatible Grade Epoxy for an Implantable Bioartificial Kidney

Cindy Ayala¹, Jimmy Ly², Nathan Wright², and Shuvo Roy²
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²University of California, San Francisco, San Francisco, CA

SAT-738

Three Dimensional Confined Microcavity Flow Development for Size Specific Cell Capture

Darren Lo¹, Reem Khojah¹, Fiona Tang¹, and Dino Di Carlo¹
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SAT-739

Inducing Immune Response Memory in Treatment of Triple Negative Breast Cancer with Localized Hyperthermia via Targeted Iron Oxide Particles

Gil Covarrubias¹, Abdelrahman Rahmy¹, Claudia Jazowski¹, Georgia Loutrianakis¹, Pubudu Peiris¹, and Efstathios Karathanasis¹
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SAT-740

Advanced Image Classification Workflow to Quantify Extracellular Matrices of Bioprosthetic Heart Valves

Jack Ogle¹ and William Holmberg¹
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SAT-741

Exploring the Role of Vimentin Intermediate Filaments in Cellular Mechanosensation

Jacob Maciel^{1,2}, Alison Patteson¹, and Paul Janmey^{1,2}
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SAT-742

Wearables and Bubbles: Identifying Young Children with Internalizing Disorders

Jordyn Scism¹, Ellen McGinnis¹, Jessica Hruschak², Nestor Lopez-Duran², Kate Fitzgerald², Katherine Rosenblum², Maria Muzik², and Ryan McGinnis¹
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SAT-743

Infant Feed Thickening Characterization at Children's Hospital of Pittsburgh

Kelsey Toplak¹, Kimberly Kubistek², Kelly Fill², Sheryl Rosen², and Mark Gartner¹
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SAT-744

Angiogenic Response to Abdominal and Vaginal Polypropylene Mesh Implants in a Rabbit Model

McKenzie Sicke¹, Aimon Iftikhar^{1,2}, Alexis Nolfi^{1,2}, Hannah Geisler¹, and Bryan Brown^{1,2}
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SAT-745

Computational Assessment of Genetic and Geographic Diversity of MSL10 in Arabidopsis Thaliana

Pranav Maddula¹, Debarati Basu¹, and Elizabeth Haswell¹
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SAT-746

Development of a Wearable Sensor System to Quantify Dynamic Stability

Siniva Areta¹, Nekiyah Draper², and Ann Reinthal³
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SAT-747

Adventitial Delivery of Adipose-Derived Mesenchymal Stem Cells to Large Animal Aortas

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Track: Undergraduate Research & Design

Undergraduate Other/Non-specified

SAT-748

Human Organotypic Cardiac Slices: A Platform Studying Long QT Phenotype

Anastasia Carr¹, Alexandra Krebs¹, Jaclyn Brennan¹, Anna Gams¹, Rose Yin¹, Rokhaya Faye¹, and Igor Efimov¹
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SAT-749

Evidence for Atrial Fibrillation and Atrial Fibrosis in Mouse Model of Pancreatic Cancer

Anna Gams¹, Sharon George¹, Aileen Venegas¹, Stephanie Perkill¹, Alexandros Tzatsos¹, and Igor Efimov¹
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SAT-750

The Study of Phosphorylatable Amino Acid Structural Fingerprints

Britney Alcira¹, Abigail Casey¹, Caroline Campbell¹, and Gregory Triplett¹
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SAT-751

Characterizing Planarian Responses to Light Source Localization Toward High-Throughput Applications

Conor Kelly¹, Johnathan Morris¹, Morgan Dean¹, Morgan Miller¹, and Mary Staehle¹
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SAT-752

Identification of Filamentous Fungi with the MALDI-TOF Mass Spectrometer

Evelyn Byrd¹, Karen Timm², and Karissa Culbreath^{2,3}
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SAT-753

The Extracellular Matrix Mediates Time Dependent Responses of Epithelial-Mesenchymal Transition

Kristin Kim¹, Lewis Scott¹, and Christopher Lemmon¹
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SAT-754

Rapidly Integrated Microfluidic Debubbler

Matthew Williams¹, Nicole Mazzola¹, Adeel Ahmed¹, and Vinay Abhyankar¹
¹Rochester Institute of Technology, Rochester, NY

SAT-755

Mathematical Model of Intestinal Edema as Both the Cause and Effect of Prolonged Ileus

Megan Dole¹, Monica Nguyen¹, Etie! Ghirmay¹, Lindsey Paul¹, Madison Sanchez¹, Ranjeet Dongaonkar¹, and Christopher Quick¹
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SAT-756

Exploring Heterogeneity of IL-12 Secretion in Bone Marrow-Derived Macrophages

Meibin Chen¹, Andrés Muñoz¹, Victor Bass¹, Amanda Alexander¹, Laura Kellman¹, and Kathryn Miller-Jensen¹
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SAT-757

Anatomical Abnormalities Following Exposure to Neurodevelopmental Toxins in *Schmidtea mediterranea*

Morgan Miller¹, Johnathan Morris¹, Conor Kelly¹, and Mary Staehle¹
¹Rowan University, Glassboro, NJ

SAT-758

Ascitegenic Gains: Identifying the Primary Mechanical Determinants of Ascites Fluid Formation

Nicholas Tan¹, Robert Goodman², Hardy Prosper¹, Noor Zabad³, Huston Svondrk⁴, Ranjeet Dongaonkar⁵, and Christopher Quick⁵
¹Texas A&M University, Round Rock, TX, ²Texas A&M University, San Antonio, TX, ³Texas A&M University, Beaumont, TX, ⁴Texas A&M University, Richardson, TX, ⁵Texas A&M University, College Station, TX

SAT-759

A 6 DOF Force Transducer for Use with the Da Vinci Surgical System in Research Settings

Omar Ahmed¹ and Philip Brown²
¹Saint Louis University, Saint Louis, MO, ²Wake Forest Baptist Health, Winston-Salem, NC

SAT-760

Comparing Mechanical Properties of PLA, HDPE, and HDPE with Montmorillonite Clay for Fused Deposition Modeling in Additive Manufacturing

Rachel Cadle¹, Kaylee Crowell¹, Matthew Joseph¹, Pratik Rath¹, Andres Tovar¹, and Amanda Siegel²
¹Indiana University-Purdue University Indianapolis, Indianapolis, IN, ²Integrated Nanosystems Development Institute, Indianapolis, IN

SAT-761

Improved Drug Affinity of Cyclodextrin through Virtual Click Chemistry Reactions

Richard Ojo¹, Kathleen Young², Edgardo Rivera², and Horst von Recum²
¹University of Maryland College Park, Bowie, MD, ²Case Western Reserve University, Cleveland, OH

SAT-762

An Analysis of Skin Roughness Using Optical Coherence Tomography

Sarosh Irani¹, Zahra Turani², Audrey Fotouhi³, Darius Mehregan³, Juri Gelovani^{1,4}, and Mohammadreza Nasiriavanaki^{1,3,4}
¹Wayne State University, Detroit, MI, ²Sharif University of Technology, Tehran, Iran, ³Wayne State University School of Medicine, Detroit, MI, ⁴Barbara Ann Karmanos Cancer Institute, Detroit, MI

SAT-763

Tracking Synthetic Bacterial Communities with Combinatorial DNA Barcoding

William Herbert¹ and Paul Jensen¹
¹University of Illinois at Urbana-Champaign, Urbana, IL

SAT-764

A qPCR Based Assay for Detecting Mycoplasma Contamination in Cell Lines

Zachary Fritts¹, Marcela Karpuj², and Sarit Sivan²
¹University of Pittsburgh, Dalton, OH, ²Ort Braude College of Engineering, Karmiel, Israel

SAT-765

Measuring Susceptibility to Seizures After Blast-Induced Traumatic Brain Injury

Swathi Pavuluri¹, Madhuvika Murugan¹, Vijayalakshmi Santhakumar^{2,3}, and Namas Chandra¹
¹New Jersey Institute of Technology, Newark, NJ, ²Rutgers New Jersey Medical School, University of California, Newark, NJ, ³University of California, Riverside, CA

SAT-766

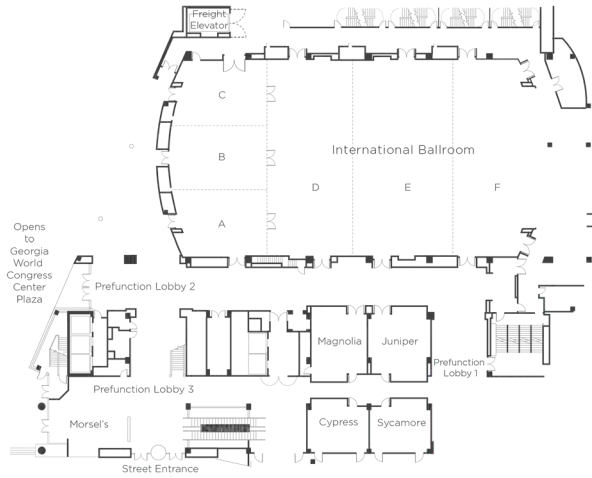
A Flexible, Robust Microbead-based Assay for Quantification and Normalization of Protein Concentration

Alexandra Crowley¹, Eric Snider², and C. Ross Ethier²
¹Georgia Institute of Technology, Atlanta, GA, ²Georgia Institute of Technology and Emory University, Atlanta, GA

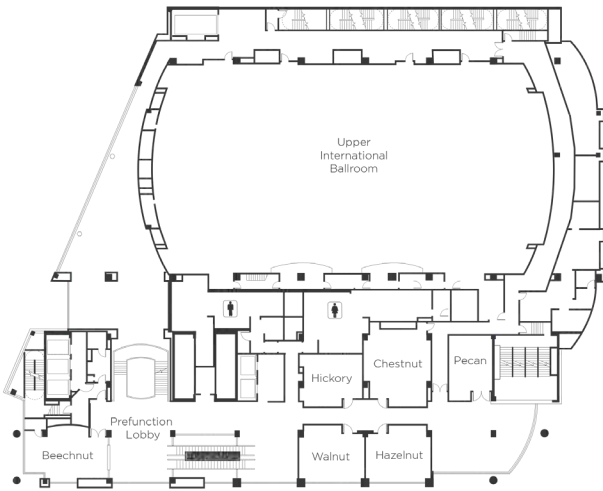
North Tower M1 Street Level



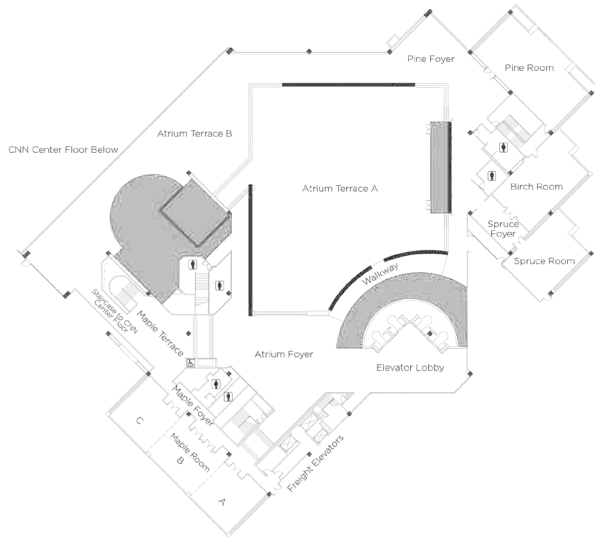
North Tower M2 International Ballroom



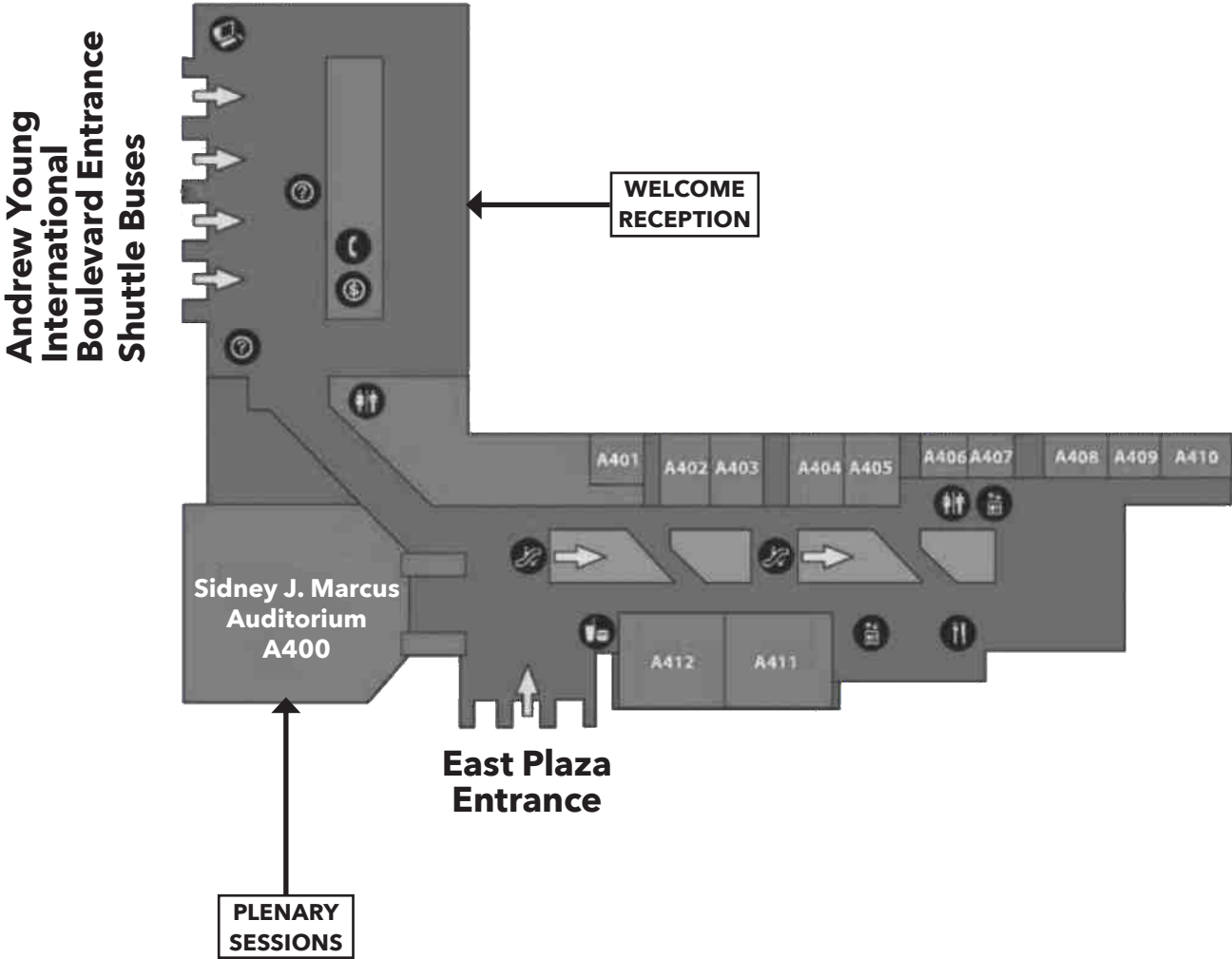
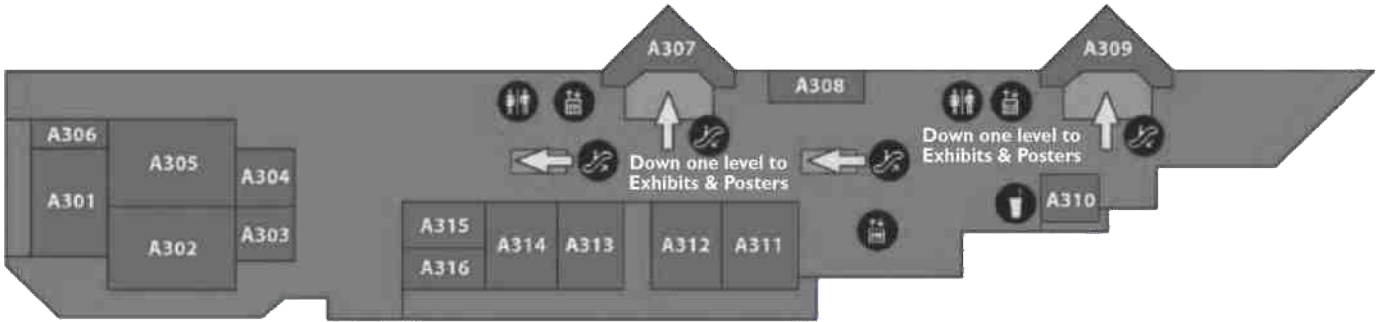
North Tower M3 Meeting Level




South Tower Atrium Terrace




Level 3
Down One Level to Exhibit Hall A2
Registration, Exhibits and Posters



Program At-A-Glance | Thursday | October 18, 2018

TRACK	8:00 am–9:30 am	1:30 pm–3:00 pm	3:45 pm–5:15 pm
BIOINFORMATICS, COMPUTATIONAL AND SYSTEMS BIOLOGY	Analysis of Cell Signaling <i>Room A407</i>	Single-cell Measurements and Models <i>Room A407</i>	Systems Approaches to Therapy Therapeutics, and Precision Medicine <i>Room A407</i>
BIOMATERIALS <i>Track sponsored by</i> 	Hydrogels I <i>Room A311</i> 3D Printing I <i>Room A312</i>	Hydrogels II <i>Room A311</i> 3D Printing II <i>Room A312</i>	New Hydrogel Methods <i>Room A311</i> Biomaterials in Regenerative Medicine <i>Room A312</i> Biomechanics of Biomaterials <i>Room A313</i>
BIOMECHANICS	Human Performance and Sports Biomechanics I <i>Room A313</i> Cancer Mechanobiology I <i>Room A314</i>	Human Performance and Sports Biomechanics II <i>Room A313</i> Cancer Mechanobiology II <i>Room A314</i>	Biomechanics of Biomaterials <i>Room A313</i> Cardiovascular Biomechanics <i>Room A314</i> Matrix Effects in Mechanobiology I <i>Room A315</i>
BIOMEDICAL ENGINEERING EDUCATION		Innovation in Design <i>Sidney Marcus Auditorium</i>	Novel Pedagogy <i>Room A409</i>
BIOMEDICAL IMAGING & INSTRUMENTATION	Ultrasound Imaging <i>Room A315</i> Novel Optical Techniques and Devices <i>Room A316</i>	Photoacoustic Imaging <i>Room A315</i> Cancer Imaging <i>Room A316</i>	Cardiovascular/Flow Imaging <i>Room A316</i>
CANCER TECHNOLOGIES	Microfluidic and Microscale Cancer Models <i>Room A410</i> Cancer Mechanobiology I <i>Room A314</i>	Tumor Metastasis <i>Room A410</i> Cancer Mechanobiology II <i>Room A314</i> Cancer Imaging <i>Room A316</i> Cancer Cell Motility and Migration <i>Room 404</i>	Cancer Immunoengineering <i>Room A410</i> Drug Delivery for Immunomodulation and Immunotherapy <i>Room A406</i>
CARDIOVASCULAR ENGINEERING	Cardiovascular Tissue Engineering <i>Room A302</i> Angiogenesis and Engineered Vascularization <i>Room A401</i>	Computational Modeling in the Cardiovascular System <i>Room A401</i>	Cardiovascular Biomechanics <i>Room A314</i> Cardiovascular/Flow Imaging <i>Room A316</i> Thrombosis and Hemostasis <i>Room A401</i>
CELLULAR & MOLECULAR BIOENGINEERING	Extracellular Matrix and Biomaterials <i>Room A403</i> Cell Migration <i>Room A404</i> Analysis of Cell Signaling <i>Room A407</i>	Drugs and Growth Factors <i>Room A403</i> Cancer Cell Motility and Migration <i>Room A404</i> Single-cell Measurements and Models <i>Room A407</i>	Probes and Signaling <i>Room A403</i> ImmunoEngineering <i>Room A404</i> Matrix Effects in Mechanobiology I <i>Room A315</i>
DEVICE TECHNOLOGIES & BIOMEDICAL ROBOTICS	Interventional Devices and Robotics <i>Room A305</i>	Implantable Devices I <i>Room A305</i>	Implantable Devices II <i>Room A305</i>
DRUG DELIVERY & INTELLIGENT SYSTEMS	Delivery Systems for Proteins and Vaccines <i>Room A406</i> Advances in Respiratory Drug Delivery & Tissue Engineering <i>Room A409</i>	Topics in Drug Delivery <i>Room A406</i> Drugs and Growth Factors <i>Room A403</i>	Drug Delivery for Immunomodulation and Immunotherapy <i>Room A406</i>
NANO AND MICRO TECHNOLOGIES	Nanotechnologies for Nucleic Acid Detection and Exosome Analysis <i>Room A405</i>	Tissues-on-Chip for Biomedicine <i>Room A405</i>	Micro/Nano Fluidic Engineering and Lab-on-Chip Systems <i>Room A405</i>


Program At-A-Glance | Thursday | October 18, 2018

TRACK	8:00 am–9:30 am	1:30 pm–3:00 pm	3:45 pm–5:15 pm
NEURAL ENGINEERING	Neural Device Interfaces <i>Room A303</i>	Neural Disease: Model Systems and Therapeutics <i>Room A303</i>	Neural, Vascular and Immuno Tissue Engineering <i>Room A302</i> Repair and Regeneration of Brain and Spinal Cord <i>Room A303</i>
ORTHOPEDIC AND REHABILITATION ENGINEERING		Musculoskeletal Tissue Engineering I <i>Room A304</i>	Musculoskeletal Tissue Engineering II <i>Room A304</i>
RESPIRATORY BIOENGINEERING	Advances in Respiratory Drug Delivery & Tissue Engineering <i>Room A409</i>	Respiratory Modeling & Mechanobiology <i>Room A409</i>	
STEM CELL ENGINEERING	Stem Cells in Tissue Engineering <i>Room A408</i>	Advanced Biomanufacturing and Translation of Stem Cell Therapies <i>Room A408</i>	
TISSUE ENGINEERING <i>Track sponsored by</i>  University of CINCINNATI	Cardiovascular Tissue Engineering <i>Room A302</i> Stem Cells in Tissue Engineering <i>Room A408</i>	Tissue Interfaces & Patterning <i>Room A302</i> Musculoskeletal Tissue Engineering I <i>Room A304</i>	Neural, Vascular and Immuno Tissue Engineering <i>Room A302</i> Musculoskeletal Tissue Engineering II <i>Room A304</i>
TRANSLATIONAL BIOMEDICAL ENGINEERING	Interventional Devices and Robotics <i>Room A305</i> Tissue Biofabrication and Cell Therapies <i>Room A304</i>		Preclinical Models <i>Room A408</i>
INDUSTRY	8:00 am–10:00 am Tech Transfer Innovation Challenge <i>Room A402</i>	1:15 pm–3:15 pm Entrepreneur Workshop <i>Room A402</i>	
OTHER	The Future of Bioelectronics: Materials, Processes and Applications <i>Room A301</i> State-of-the-Art Immuno-Engineering and Future Opportunities <i>Room A411</i> Single Cell Analysis and Tumor Heterogeneity <i>Room A310</i> 50th Anniversary Jeopardy <i>Georgia State Room</i>	NIH Funding Panel Session <i>Room A301</i> Soft Material-Enabled Electronics for Medicine, Healthcare, and Human-Machine Interfaces <i>Room A310</i> 2:30pm–5:00pm 6th US-Korea Joint BMES Workshop on Biomedical Engineering <i>Room A411</i>	DEBUT Winner Presentations and Award Ceremony <i>Room A301</i> Novel Photoacoustic Imaging: Systems, Computation, and Agents <i>Room A310</i> 2:30pm–5:00pm 6th US-Korea Joint BMES Workshop on Biomedical Engineering <i>Room A411</i>
STUDENT AND EARLY CAREER	9:00 am–10:00 am Marketing Yourself: Tips for a Successful Job Search <i>Room A412A</i>	1:30 pm–2:45 pm BME Careers in Industry I <i>Room A412A</i> 2:30 pm–4:00 pm Rapid Resume Review—Members Only <i>Exhibit Hall Career Zone</i>	3:00 pm–4:00 pm BME Careers in Academia <i>Room A412A</i> 4:15 pm–5:15 pm BME Careers in Industry II <i>Room A412A</i>


Program At-A-Glance | Friday | October 19, 2018

TRACK	8:00 am–9:30 am	1:15 pm–2:45 pm	3:30 pm–5:00 pm
BIOINFORMATICS, COMPUTATIONAL AND	Omics Data: Methods, Modeling and Analysis <i>Room A407</i>	Imaging Data Science, Processing, Modeling and Informatics <i>Room A316</i> Synthetic Biology, Cell Systems Engineering, and Related Technologies <i>Room A407</i>	
BIOMATERIALS <i>Track sponsored by</i> 	Biomaterials for Drug Delivery I <i>Sidney Marcus Auditorium</i> Natural Biomaterial <i>Room A312</i> Engineering the Stem Cell Microenvironment <i>Room A408</i>	Biomaterials for Drug Delivery I <i>Sidney Marcus Auditorium</i> Scaffolds I <i>Room A312</i> Biomaterials for Translational Applications <i>Room A313</i>	Characterizing and Modeling the Microenvironment <i>Room A311</i> Scaffolds II <i>Room A312</i> Chips and Devices <i>Room A313</i>
BIOMECHANICS	Biomechanics of Rehabilitation <i>Room A313</i> Biomechanics in Cell and Tissue Engineering <i>Room A314</i> Matrix Effects in Mechanobiology II <i>Room A315</i>	Cellular and Molecular Biomechanics: Mechanobiology I <i>Room A314</i> Mechanobiology of Cell Adhesion <i>Room A315</i>	Cellular and Molecular Biomechanics: Mechanobiology II <i>Room A314</i> Cancer Mechanobiology <i>Room A410</i>
BIOMEDICAL ENGINEERING EDUCATION	Program Development & Assessment <i>Room A409</i>		
BIOMEDICAL IMAGING AND INSTRUMENTATION	Imaging Strategies and Molecular Profiling <i>Room A410</i> Optics and Spectroscopy in Blood and Cardiovascular Applications <i>Room A316</i>	Imaging Data Science, Processing, Modeling and Informatics <i>Room A316</i> Imaging in Cardiovascular Systems <i>Room A401</i>	Neuroimaging, Neuromodulation and Neurosurgery <i>Room A316</i>
CANCER TECHNOLOGIES	Imaging Strategies and Molecular Profiling <i>Room A410</i>	Precision Medicine in Cancer <i>Room A410</i> Photoresponsive Nanomedicines and Immunotherapies for Cancer <i>Room A405</i>	Cancer Mechanobiology <i>Room A410</i>
CARDIOVASCULAR ENGINEERING	Cardiovascular Models and Remodeling <i>Room A401</i> Heart Valve Structure and Replacement <i>Room A403</i> Optics and Spectroscopy in Blood and Cardiovascular Applications <i>Room A316</i>	Imaging in Cardiovascular Systems <i>Room A401</i> Vascular Tissue Engineering <i>Room A403</i>	Vascular Devices and Hemodynamics <i>Room A401</i> Myocardial Tissue Engineering <i>Room A403</i>
CELLULAR & MOLECULAR BIOENGINEERING	Matrix Effects in Mechanobiology II <i>Room A315</i> Engineering Multi-cellular Systems <i>Room A302</i> Young Innovators of Cellular and Molecular Bioengineering: Part I <i>Room A404</i>	Cellular and Molecular Biomechanics: Mechanobiology I <i>Room A314</i> Young Innovators of Cellular and Molecular Bioengineering: Part II <i>Room A404</i>	Cellular and Molecular Biomechanics: Mechanobiology II <i>Room A314</i> Molecular and Cellular ImmunoEngineering <i>Room A404</i>
DEVICE TECHNOLOGIES AND BIOMEDICAL ROBOTICS	Prosthetics and Exoskeletons <i>Room A305</i>	Assistive Technologies <i>Room A305</i>	Diagnostic Technology for Low-Resource Settings <i>Room A305</i> Vascular Devices and Hemodynamics <i>Room A401</i>
DRUG DELIVERY & INTELLIGENT SYSTEMS	Biomaterials for Drug Delivery I <i>Sidney Marcus Auditorium</i>	Biomaterials for Drug Delivery II <i>Sidney Marcus Auditorium</i> Nanotechnologies for Drug and Nucleic Acid Delivery and Immunotherapy <i>Room A406</i>	Drug Delivery for Implants and Responsive Drug Delivery Systems <i>Room A407</i>


Program At-A-Glance | Friday | October 19, 2018

TRACK	8:00 am–9:30 am	1:15 pm–2:45 pm	3:30 pm–5:00 pm
NANO AND MICRO TECHNOLOGIES	<p>Nanotechnologies for Medical Applications Room A405</p> <p>Molecular Sensors and Nanodevices for Diagnostics Room A406</p>	<p>Photoresponsive Nanomedicines and Immunotherapies for Cancer Room A405</p> <p>Nanotechnologies for Drug and Nucleic Acid Delivery and Immunotherapy Room A406</p>	<p>Structure Function Relationships in Nanomedicine Room A405</p> <p>Micro and Nano-Technologies for Cellular Analysis and Neuroscience Room A406</p> <p>Chips and Devices Room A313</p>
NEURAL ENGINEERING	<p>Neuromodulation Room A303</p>	<p>Neural Cell Model Systems Room A303</p>	<p>Neural Decoding and Control Room A303</p> <p>Neuroimaging, Neuromodulation and Neurosurgery Room A316</p> <p>Micro and Nano-Technologies for Cellular Analysis and Neuroscience Room A406</p> <p>Neural Stem/Progenitor Cell Engineering Room A408</p>
ORTHOPEDIC AND REHABILITATION ENGINEERING	<p>Prosthetics and Exoskeletons Room A305</p>	<p>Musculoskeletal Tissue Engineering III Room A302</p> <p>Muscle and Tendon Room A304</p>	<p>Spine and Intervertebral Disc Room A304</p>
STEM CELL ENGINEERING	<p>Cartilage and Osteoarthritis Room A304</p> <p>Engineering the Stem Cell Microenvironment Room A408</p>	<p>Controlling Stem Cell Differentiation Using Novel Technologies Room A408</p>	<p>Development Biology and Stem Cells in Tissue Engineering Room A315</p> <p>Neural Stem/Progenitor Cell Engineering Room A408</p>
<p>TISSUE ENGINEERING Track sponsored by</p> 	<p>Engineering Multi-cellular Systems Room A302</p> <p>Biomechanics in Cell and Tissue Engineering Room A314</p>	<p>Musculoskeletal Tissue Engineering III Room A302</p> <p>Vascular Tissue Engineering Room A403</p>	<p>Advanced Biomanufacturing in Tissue Engineering Room A302</p> <p>Myocardial Tissue Engineering Room A403</p> <p>Development Biology and Stem Cells in Tissue Engineering Room A315</p>
INDUSTRY	<p>8:00 am–9:00 am Product Development Implications based on FDA Medical Device Classification Room A402</p> <p>9:00 am–10:15 am Connecting Engineering Skillsets with Professional Achievement and Advancement Room A402</p>	<p>1:00 pm–2:30 pm Clinical Innovators Spotlight Room A402</p>	
OTHER	<p>Systems Thinking in the Education of Biomedical Engineering Students Room A301</p> <p>Advanced Biomanufacturing Session I: Advanced Tissue Biofabrication Room A311</p> <p>AAA-BMES Symposium: Engineering and Imaging the Stem Cell Niche for Guided Regeneration Room A411</p>	<p>BMES-NSF Special Session on CAREER and UNSOLICITED Awards Room A301</p> <p>Advanced Biomanufacturing Session II: Advanced Cell Biomanufacturing Room A311</p> <p>Engineering Solutions to Health Care Disparities Room A409</p>	<p>Physical Science Oncology Networking Physical Science Oncology Networking Room A411</p> <p>Athanasίου Annals of Biomedical Engineering Student Award Session Room A409</p> <p>BMES Graduate Medical Innovation Program Workshop Part III: Defining Student Archetype(s) Room A310</p>
STUDENT AND EARLY CAREER	<p>8:00 am–10:30 am BMES Student Chapter: Chapter Best Practices Room A310</p> <p>9:00 am–10:00 am The Path to Graduate School Room A412A</p>	<p>1:30 pm–2:30 pm BME Entrepreneurial Careers Room A412A</p> <p>1:45 pm–3:15 pm BMES Student Chapter: BMES Undergraduate Student Design Competition Room A310</p> <p>2:30 pm–4:00 pm Rapid Resume Review—Members Only Exhibit Hall Career Zone</p>	<p>3:30 pm–5:00 pm Networking Effectively Online and in Person Room A412A</p>

Program At-A-Glance | Saturday | October 20, 2018

TRACK	8:00 am–9:30 am	1:30 pm–3:00 pm	3:15 pm–4:45 pm
BIOINFORMATICS, COMPUTATIONAL AND SYSTEMS BIOLOGY		Computational Modeling of Cancer Room A304	Systems Biology of Infectious Disease Room A304
BIOMATERIALS <i>Track sponsored by</i> 	Biomaterials for Immunoengineering I Room A312	Biomaterials for Immunoengineering II Room A312	Drug Delivering Biomaterials Room A407
BIOMECHANICS	Brain Injury Biomechanics <i>Sidney Marcus Auditorium</i> Biofluid Mechanics Room A314 Biomechanics in Cell and Tissue Engineering Room A302 Cardiovascular Mechanobiology Room A401 Cellular and Molecular Biomechanics: Mechanobiology Room A404	Injury Biomechanics I Room A313 Computational and Multiscale Modeling in Biomechanics Room A314 Traumatic Brain Injury Biomechanics and Neuromuscular Biomechanics Room A303	Injury Biomechanics II Room A313
BIOMEDICAL ENGINEERING EDUCATION	Evidence-based Pedagogy Room A409		
BIOMEDICAL IMAGING AND INSTRUMENTATION	Fluorescence Room A315 Imaging in Neuroscience Room A316	MRI I Room A315 Theranostic and Imaging Contrast Agents Room A316 Imaging Technologies and Image-Guided Therapies Room A406	MRI II Room A315 Detection, Therapy and Monitoring Room A316 Advances in Sensing and Imaging Technology Room A305
CANCER TECHNOLOGIES	Physical and Biochemical Pathways in Cancer Room A410	Cancer Drug Delivery I Room A311 Drug Delivery and Immunodulation Room A410 Computational Modeling of Cancer Room A304	Cancer Drug Delivery II Room A311 Tumor Microenvironment Room A410
CARDIOVASCULAR ENGINEERING	Cardiovascular Mechanobiology Room A401 Valvular and Vascular Computational Modeling Room A403	Cardiovascular Stem Cells and Regeneration Room A401	Cardiovascular Electrophysiology Room A401
CELLULAR & MOLECULAR BIOENGINEERING	Cellular and Molecular Biomechanics: Mechanobiology Room A404	Engineering Multi-Cellular Systems Room A404	Micro/Nano Tools in Molecular Biology Room A404
DEVICE TECHNOLOGIES AND BIOMEDICAL ROBOTICS	Point of Care: Enabling Technology and Applications Room A305 Interventional Devices and Micro/Nano Tools Room A406	Wearable and Implantable Sensor Technology Room A305 Device Applications and Translation Room A412	Advances in Sensing and Imaging Technology Room A305
DRUG DELIVERY & INTELLIGENT SYSTEMS	Nanoparticles for Drug Delivery and Genetic Engineering Room A407	Cancer Drug Delivery I Room A311 Drug Delivery and Immunodulation Room A410 Targeted or Responsive Delivery Systems Room A407	Cancer Drug Delivery II Room A311 Drug Delivering Biomaterials Room A407

Program At-A-Glance | Saturday | October 20, 2018

TRACK	8:00 am–9:30 am	1:30 pm–3:00 pm	3:15 pm–4:45 pm
NANO AND MICRO TECHNOLOGIES	Organ-on-Chip for Regenerative Medicine I <i>Room A405</i>	Organ-on-Chip for Regenerative Medicine II <i>Room A302</i> Micro and Nano-Fluidic Engineering and Bioinspired Nano Devices <i>Room A403</i> Micro/Nano Tools for Cell Sorting, Disease Detection and Diagnosis <i>Room A405</i>	Micro/Nano Tools in Molecular Biology <i>Room A404</i> Nanotechnologies for Global Health and Infectious Diseases <i>Room A405</i> Micro/Nano Tools in Neural Engineering <i>Room A303</i>
NEURAL ENGINEERING	Imaging in Neuroscience <i>Room A316</i> Stem/Progenitor Cells for Neural Applications <i>Room A303</i>	Traumatic Brain Injury Biomechanics and Neuromuscular Biomechanics <i>Room A303</i>	Micro/Nano Tools in Neural Engineering <i>Room A303</i>
ORTHOPEDIC AND REHABILITATION ENGINEERING	Musculoskeletal Tissue Engineering II <i>Room A313</i>		
STEM CELL ENGINEERING	Stem/Progenitor Cells for Neural Applications <i>Room A303</i>	Cardiovascular Stem Cells and Regeneration <i>Room A401</i>	Stem Cells in Tissue Engineering II <i>Room A312</i>
TISSUE ENGINEERING <i>Track sponsored by</i>  University of CINCINNATI	Musculoskeletal Tissue Engineering II <i>Room A313</i> Biomechanics in Cell and Tissue Engineering <i>Room A302</i> Organ-on-Chip for Regenerative Medicine I <i>Room A405</i>	Engineering Multi-Cellular Systems <i>Room A404</i> Organ-on-Chip for Regenerative Medicine I <i>Room A302</i>	Immunoengineering and Immunomodulation in Tissue Engineering <i>Room A302</i> Printing and Patterning in Tissues <i>Room A314</i> Stem Cells in Tissue Engineering II <i>Room A312</i>
TRANSLATIONAL BIOMEDICAL ENGINEERING	Interventional Devices and Micro/Nano Tools <i>Room A406</i>	Imaging Technologies and Image-Guided Therapies <i>Room A406</i> Device Applications and Translation <i>Room A412</i>	
UNDERGRADUATE RESEARCH & DESIGN	Undergraduate Research & Design I <i>Room A408</i>	Undergraduate Research & Design II <i>Room A408</i>	Undergraduate Research & Design III <i>Room A408</i>
OTHER	Application of Two Dimensional Materials in Healthcare <i>Room A310</i> Scientific Advancement in the Biomechanics of Prosthetic Heart Valves <i>Room A311</i> BMES-NSF Special Session on Graduate Research Fellowships Program <i>Room A301</i>		

Schedule At-A-Glance

WEDNESDAY | OCTOBER 17, 2018

12:00 noon–7:00 pm	Registration	GWCC, Exhibit Hall A1-3
8:30 am–4:30 pm	BMES Board of Directors Meeting	GWCC, Executive Board Room
2:00 pm–5:00 pm	Georgia Tech Tours (<i>preregistration required</i>)	Leave from GWCC
3:00 pm–5:00 pm	SPECIAL SESSION: Black Women in Biomedical Engineering: Lessons for Healthy and Successful Career Advancement (<i>preregistration required</i>)	Omni, Dogwood AB Room
3:30 pm–5:30 pm	Meet the Faculty Candidates	GWCC, Exhibit Hall
3:30 pm–5:00 pm	SPECIAL SESSION: BMES Student Chapter Development Event	GWCC, A411
4:00 pm–5:00 pm	Tips for First-time Student and Early Career Attendees	GWCC, A412A
5:30 pm–7:30 pm	Welcome Reception	GWCC, Levels 3 & 4
6:00 pm–7:00 pm	VIP Reception (<i>invitation only</i>)	Omni, Pecan Foyer
7:00 pm–10:30 pm	Council of Chairs Dinner & Meeting (<i>invitation only</i>)	Omni, Intl. Ballroom F
7:30 pm–8:30 pm	Industry Committee Planning Meeting (<i>invitation only</i>)	Omni, Magnolia Room
8:00 pm–9:00 pm	LGBT & Friends Dessert Social (<i>ticket purchase required</i>)	Omni, Intl. Ballroom ABC

THURSDAY | OCTOBER 18, 2018

7:00 am–6:00 pm	Registration	GWCC, Exhibit Hall
7:00 am–8:00 am	INDUSTRY SESSION: Council of Industry Chapter Presidents (<i>by invitation only</i>)	GWCC, A308A
7:00 am–8:00 am	BMES Diversity Committee Meeting	GWCC, A308B
8:00 am–9:30 am	BMES National Meetings Committee Meeting	GWCC, A309
8:00 am–9:30 am	PLATFORM SESSIONS: Thurs-1	<i>19 concurrent sessions</i>
8:00 am–9:30 am	SPECIAL SESSION: 50th Anniversary Jeopardy	GWCC, Georgia State Room
8:00 am–9:30 am	SPECIAL SESSION: The Future of Bioelectronics: Materials, Processes and Applications	GWCC, A301
8:00 am–9:30 am	SPECIAL SESSION: State-of-the-Art ImmunoEngineering and Future Opportunities	GWCC, A411
8:00 am–9:30 am	SPECIAL SESSION: Single Cell Analysis and Tumor Heterogeneity	GWCC, A310
8:00 am–10:00 am	INDUSTRY SESSION: Tech Transfer Innovation Challenge	GWCC, A402
8:30 am–9:30 am	BMES Student Affairs Committee Meeting	GWCC, A306
9:00 am–10:00 am	Marketing Yourself: Tips for a Successful Job Search	GWCC, A412A
9:30 am–5:00 pm	Exhibit Hall Open	GWCC, Exhibit Hall A1-3
9:30 am–5:00 pm	POSTER SESSION	GWCC, Exhibit Hall
9:30 am–10:15 am	POSTER VIEWING WITH AUTHORS & Refreshment Break	GWCC, Exhibit Hall
9:30 am–10:30 am	BMES Ethics Subcommittee Meeting	GWCC, A308A
10:15 am–11:30 am	PLENARY SESSION: State of the Society by BMES President, Lori Setton, PhD & Pritzker Distinguished Lecture, Rashid Bashir, PhD <i>Department of Bioengineering, University of Illinois</i>	GWCC, Sidney Marcus Auditorium
11:45 am–1:15 pm	CELEBRATION OF MINORITIES IN BME LUNCHEON <i>Speaker: Paula Hammond, PhD, Koch Institute for Integrative Cancer Research Massachusetts Institute of Technology (ticket purchase required)</i>	GWCC, A411
11:45 am–1:15 pm	Lunch on Own	
1:00 pm–3:00 pm	AEMB: Mentoring for INnovative Design Solutions (MINDS) Workshop (<i>by invitation</i>)— <i>affiliate event</i>	GWCC, Georgia State Room
1:15 pm–3:15 pm	INDUSTRY SESSION: Entrepreneur Workshop (<i>ticket purchase required</i>)	GWCC, A402A
1:30 pm–3:00 pm	PLATFORM SESSIONS: Thurs-2	<i>20 concurrent sessions</i>
1:30 pm–2:45 pm	BME Careers in Industry I	GWCC, A412A
1:30 pm–3:00 pm	SPECIAL SESSION: NIH Funding Panel Session	GWCC, A301
1:30 pm–3:00 pm	SPECIAL SESSION: Soft Material-Enabled Electronics for Medicine, Healthcare, and Human-Machine Interfaces	GWCC, A310

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PLENARY SESSION	PLATFORM SESSION	POSTERS	SPECIAL SESSIONS
STUDENT/EARLY CAREER	EXHIBITS	SPECIAL EVENTS	COMMITTEE MEETINGS

Schedule At-A-Glance

THURSDAY | OCTOBER 18, 2018 *(continued)*

2:30 pm – 4:00 pm	Rapid Resume Review: Members Only	GWCC-Exhibit Hall Career Zone
2:30 pm – 5:00 pm	SPECIAL SESSION: 6th US-Korea Joint BMES Workshop on Biomedical Engineering	GWCC, A411
3:00 pm – 3:45 pm	POSTER VIEWING WITH AUTHORS & Refreshment Break	GWCC, Exhibit Hall
3:00 pm – 4:00 pm	BME Careers in Academia	GWCC, A412A
3:45 pm – 5:15 pm	PLATFORM SESSIONS: Thurs-3	19 concurrent sessions
3:45 pm – 5:15 pm	SPECIAL SESSION: Novel Photoacoustic Imaging: Systems, Computation, and Agents	GWCC, A310
3:45 pm – 5:15 pm	SPECIAL SESSION: NIBIB DEBUT Presentations and Awards Session	GWCC, A301
4:00 pm – 5:30 pm	AEMB: Annual Grand Meeting <i>(affiliate event)</i>	GWCC, Georgia State Room
4:15 pm – 5:15 pm	BME Careers in Industry II	GWCC, A412A
4:30 pm – 5:30 pm	Coulter College Steering Committee Meeting	GWCC, A308A
5:30 pm – 6:30 pm	PLENARY SESSION: Diversity Award Lecture, Anjelica L. Gonzalez, PhD, <i>School of Engineering and Applied Science, Yale University & BMES Fellows</i>	GWCC, Sidney Marcus Auditorium
8:00 pm – 10:00 pm	University Hosted Receptions	Omni

FRIDAY | OCTOBER 19, 2018

7:00 am – 6:00 pm	Registration	GWCC, Exhibit Hall A1-3
7:00 am – 8:00 am	BMES Education Committee Meeting	GWCC, A308B
8:00 am – 9:00 am	INDUSTRY SESSION: Product Development based on FDA Medical Device Classification	GWCC, A402
8:00 am – 9:30 am	BMES 2019 Annual Meeting Planning Committee Meeting	GWCC, A309
8:00 am – 9:00 am	BMES International Committee Meeting	GWCC, A308A
8:00 am – 9:30 am	PLATFORM SESSIONS: Fri-1	19 concurrent sessions
8:00 am – 9:30 am	SPECIAL SESSION: Systems Thinking in the Education of Biomedical Engineering Students	GWCC, A301
8:00 am – 9:30 am	SPECIAL SESSION: AAA-BMES Symposium: Engineering and Imaging the Stem Cell Niche for Guided Regeneration	GWCC, A411
8:00 am – 9:30 am	SPECIAL SESSION: Advanced Biomanufacturing Session I: Advanced Cell Manufacturing	GWCC, A311
8:00 am – 10:30 am	BMES Student Chapter: Chapter Best Practices	GWCC, A310
9:00 am – 10:00 am	The Path to Graduate School	GWCC, A412A
9:00 am – 10:15 am	AEMB Annual Ethics Session: Robot Caregivers and Health Care: Ethical Challenges for Engineers <i>(affiliate event)</i>	GWCC, Georgia State Room
9:00 am – 10:15 am	INDUSTRY SESSION: Connecting Engineering Skillsets with Professional Achievement and Advancement	GWCC, A402
9:30 am – 5:00 pm	Exhibit Hall Open	GWCC, Exhibit Hall A1-3
9:30 am – 5:00 pm	POSTER SESSION	GWCC, Exhibit Hall
9:30 am – 10:15 am	POSTER VIEWING WITH AUTHORS & Refreshment Break	GWCC, Exhibit Hall
10:15 am – 11:15 am	PLENARY SESSION/Design & Research Awards/Journal Awards NIBIB Lecture: Lihong Wang, PhD, California Institute of Technology	GWCC, Sidney Marcus Auditorium
11:15 am – 1:00 pm	Lunch on Own	
11:30 am – 1:00 pm	WOMEN IN BME LUNCHEON <i>(ticket purchase required)</i> <i>Speaker: Jennifer West, PhD, Duke University</i>	GWCC
1:00 pm – 2:30 pm	INDUSTRY SESSION: Clinical Innovators Spotlight	GWCC, A402
1:00 pm – 2:30 pm	AEMB: Intellectual Property Management, From Conception to Production and How to Protect It	GWCC, Georgia State Room
1:15 pm – 2:45 pm	PLATFORM SESSIONS: Fri-2	18 concurrent sessions
1:15 pm – 2:45 pm	SPECIAL SESSION: Advanced Biomanufacturing Session II: Advanced Tissue Biofabrication	GWCC, A311
1:15 pm – 2:45 pm	SPECIAL SESSION: Engineering Solutions to Health Care Disparities	GWCC, A409

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PLENARY SESSION	PLATFORM SESSION	POSTERS	SPECIAL SESSIONS
STUDENT/EARLY CAREER	EXHIBITS	SPECIAL EVENTS	COMMITTEE MEETINGS

Schedule At-A-Glance

FRIDAY | OCTOBER 19, 2018 *(continued)*

1:30 pm – 2:30 pm	BME Entrepreneurial Careers	GWCC, A412A
1:30 pm – 4:30 pm	SPECIAL SESSION: BMES-NSF Session on CAREER and UNSOLICITED Awards <i>(preregistration required)</i>	Room A301
1:45 pm – 3:15 pm	BMES Student Chapter: BMES Undergraduate Student Design Competition	GWCC, A310
2:30 pm – 4:00 pm	Rapid Resume Review: Members Only	GWCC-Exhibit Hall Career Zone
2:45 pm – 3:30 pm	POSTER VIEWING WITH AUTHORS & Refreshment Break	GWCC, Exhibit Hall
3:00 pm – 4:00 pm	BMES Membership Committee Meeting	GWCC, A308A
3:30 pm – 4:30 pm	Design Competition Judges Meeting	GWCC, A308B
3:30 pm – 5:00 pm	Networking Effectively Online and in Person	GWCC, A412A
3:30 pm – 5:00 pm	PLATFORM SESSIONS: Fri-3	18 concurrent sessions
3:30 pm – 5:00 pm	SPECIAL SESSION: Athanasiou Annals of Biomedical Engineering Student Award Session	GWCC, A409
3:30 pm – 5:00 pm	SPECIAL SESSION: BMES Graduate Medical Innovation Program Workshop Part III: Defining Student Archetype(s)	GWCC, A310
3:30 pm – 5:00 pm	SPECIAL SESSION: Physical Science Oncology Networking	GWCC, A411
5:15 pm – 6:15 pm	PLENARY SESSION/Chapter Awards Wallace H. Coulter Award for Healthcare Innovation: Josh Makower, MD, New Enterprise Associates, Inc	GWCC, Sidney Marcus Auditorium
6:30 pm – 8:30 pm	University Hosted Receptions	Omni
6:30 pm – 8:30 pm	Industry Mixer <i>(ticket purchase required)</i>	STATS Brewpub
6:30 pm – 8:30 pm	Physical Science Oncology Networking Reception <i>(invitation only)</i>	Omni, Hickory Room
7:00 pm – 8:30 pm	Reception for Current ABET/BMES Program Evaluators <i>(invitation only)</i>	Omni, Chestnut Room
8:30 pm – 10:30 pm	BMES DESSERT BASH	GWCC, Murphy Ballroom

SATURDAY | OCTOBER 20, 2018

7:00 am – 2:00 pm	Registration	GWCC, Exhibit Hall A1-3
8:00 am – 9:30 am	PLATFORM SESSIONS: Sat-1	17 concurrent sessions
8:00 am – 9:30 am	Undergraduate Research & Design Orals #1	GWCC, A408
8:00 am – 9:30 am	SPECIAL SESSION: BMES-NSF Session on Graduate Research Fellowships Program <i>(preregistration required)</i>	Room A301
8:00 am – 9:30 am	SPECIAL SESSION: Application of Two Dimensional Materials in Healthcare	GWCC, A310
8:00 am – 9:30 am	SPECIAL SESSION: Scientific Advancement in the Biomechanics of Prosthetic Heart Valves	GWCC, A311
8:00 am – 9:30 am	ABioM SIG Meeting	GWCC, A304
9:30 am – 1:30 pm	Exhibit Hall Open	GWCC, Exhibit Hall A1-3
9:30 am – 1:00 pm	POSTER SESSION	GWCC, Exhibit Hall
9:30 am – 10:30 am	POSTER VIEWING WITH AUTHORS & Refreshment Break	GWCC, Exhibit Hall
10:30 am – 11:45 am	PLENARY SESSION: Rita Schaffer Young Investigator Lecture and BMES Mid-Career Award Lecture	GWCC, Sidney Marcus Auditorium
11:45 am – 1:15 pm	Lunch on Own	
1:30 pm – 3:00 pm	PLATFORM SESSIONS: Sat-2	18 concurrent sessions
1:30 pm – 3:00 pm	Undergraduate Research & Design Orals #2	GWCC, A408
1:30 pm – 3:00 pm	SPECIAL SESSION: International Collaboration in Biomedical Engineering Education	GWCC, A310
3:15 pm – 4:45 pm	PLATFORM SESSION: Sat-3	17 concurrent sessions
3:15 pm – 4:45 pm	Undergraduate Research & Design Orals #3	GWCC, A408

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PLENARY SESSION	PLATFORM SESSION	POSTERS	SPECIAL SESSIONS
STUDENT/EARLY CAREER	EXHIBITS	SPECIAL EVENTS	COMMITTEE MEETINGS