



# BMES

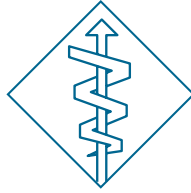
BIOMEDICAL ENGINEERING SOCIETY  
Advancing Human Health and Well Being

## 2010 ANNUAL MEETING

ENGINEERING NEW FRONTIERS  
IN MEDICINE AND BIOLOGY

**October 6–9, 2010**  
**Austin Convention Center**  
**Austin, TX**

# Austin 2010



# BMES

BIOMEDICAL ENGINEERING SOCIETY  
Advancing Human Health and Well Being

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## Future BMES Annual Meetings

**October 13-15, 2011**

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**September 25-28, 2013**

**Seattle, Washington**

**October 22-25, 2014**

**San Antonio, Texas**

**October 7-10, 2015**

**Tampa, Florida**

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**Considering attending graduate school in biomedical engineering?**

If so, you are invited to a reception sponsored by the **Graduate Program in Biomedical Engineering at Marquette University**. Refreshments will be served.

Thursday, October 7, 2010  
8:00 – 10:00 pm  
Hilton Hotel, Room 410  
500 East Fourth Street  
Austin, TX



## George A. Truskey, PhD BMES President

*Professor and Chair, Biomedical Engineering,  
Duke University*

**W**ELCOME TO THE 2010 Annual Meeting of the Biomedical Engineering Society! The theme this year is “Engineering New Frontiers in Medicine and Biology” and the Conference Chair, Professor Christine Schmidt, and the Program Chair, Professor Krishnendu Roy, have assembled an exciting meeting. I want to thank all of the track chairs and session chairs for their important role in assembling an interesting program that highlights the latest advances in both basic and translational research. Our plenary lectures highlight the range of achievement in the field. Rebecca Richards Kortum of Rice University will deliver the 2010 Robert A. Pritzker Distinguished Award Lecture. Professor Nicholas Peppas of the University of Texas at Austin will deliver the BMES Distinguished Achievement Award Lecture. Cynthia Reinhardt-King, Assistant Professor at Cornell University, was selected as this year’s BMES Rita Schaffer Memorial Award winner. This year’s winner of the BMES Diversity Award is Professor Gilda Barabino of Georgia Tech, who has actively promoted diversity both at Georgia Tech and BMES.

There are several new features to the program this year. On Wednesday afternoon, October 6, we will hold a poster session for faculty candidates. This will provide an opportunity for those BMES members looking for faculty positions to meet faculty from departments that are recruiting this year. In the afternoon of Friday October 8 leaders in the field discuss new frontiers as part of the Distinguished Speakers Session. In addition to the Women in BMES Luncheon, we’ve added a Diversity Luncheon to celebrate achievements of various groups and to examine ways to broaden the involvement in our field.

The student program includes several career related activities including an alumni panel, a resume review and writing workshop, and career fair. We have paid particular attention to ensuring that these activities better meet the needs of student members. There are undergraduate technical sessions and design project sessions and special sessions for BMES student chapters.

We welcome other student and professional groups attending the meeting including the student honor society Alpha Eta Mu Beta, the Council of Chairs, AIMBE, the BME Career Alliance, and the Whitaker International Scholars and Fellows program.

The meeting organizers have also assembled a special social event for Friday evening, October 8 at the Bob Bullock History Museum. You’ll get to sample local food and culture and gain a true appreciation for the spirit of Texas.

I hope that you have an enjoyable time at the meeting,

**George Truskey, PhD**  
*BMES President*



### Christine Schmidt, PhD

*Annual Meeting Chair*

**T**HE DEPARTMENT OF BIOMEDICAL ENGINEERING at The University of Texas at Austin is honored to be hosting the 2010 Biomedical Engineering Society (BMES) Annual Meeting on October 6–9, 2010 at the Austin Convention Center in downtown Austin. We hope that this meeting will be one of the largest and most memorable meetings in the history of BMES.

This year's meeting theme is "Engineering New Frontiers in Medicine and Biology," which reflects our goal to create a meeting that highlights the future of Biomedical Engineering. In line with our theme, we have added new features at the 2010 meeting, including a "Meet-the-Faculty-Candidates" poster session on Wednesday October 6 from 3–5 pm, and an additional plenary session, "Future Frontiers of Biomedical Engineering," on Friday October 8 from 4–6 pm, just preceding the Friday night event. This session is hosted by the University of Texas at Austin's Biomedical Engineering Department, and will feature four key leaders in the field who will speculate on the future of Biomedical Engineering.

Technical Program Chair Krishnendu Roy has assembled a diverse technical program featuring presentations focusing on the future of biomedical engineering in areas such as: cardiovascular, cellular and molecular, neural, respiratory, tissue, translational, and orthopedic and rehabilitation engineering; biomedical imaging and optics; systems biology; bioinformatics and computational biology; education; medical devices; and drug delivery, among other topics.

We hope that BMES attendees will also take an opportunity to experience Austin. Austin boasts many exciting points of interest, including the LBJ Presidential Library, the Harry Ransom Center (home to the Gutenberg Bible and the first ever photograph), the Blanton Art Museum, the Congress Avenue Bat Bridge, Austin's famous 6th Street and Warehouse District, South Congress ("SoCo"), the Austin Children's Museum, Barton Springs, Zilker Park, and many more attractions! The Austin City Limits (ACL) Music Festival, which brings together more than 130 bands on eight stages, will also be held from October 8–10, at nearby Zilker Park; thus, music-loving BMES participants have the opportunity to listen to a variety of music including rock, country, folk, hip-hop, reggae, and bluegrass at the festival as well as at Austin's many other live music venues.

The Friday night event is sure to be memorable! The event will take place at the Bob Bullock Texas State History Museum, located near the Texas State Capitol Building and The University of Texas at Austin. The museum houses 33,000 square feet of interactive exhibits that detail the history of this unique state. All attendees at the event are encouraged to also visit the Texas Spirit Theater—the largest multimedia special effects theater of its kind in Texas—to experience a thrilling journey as Texas history comes to life. We plan to have Texas-style fajitas and BBQ, Austin's famous Amy's ice cream, live Austin music, and some special surprises.

Many thanks to the entire Austin programming team (Krish Roy, Jack Hart, James Tunnell, Stanislav Emelianov, Mauro Ferrari, Laura Suggs, Andy Dunn, Mia Markey and Randi Voss), our BME Department Chair, Nicholas Peppas for valuable input and financial support, and to our dedicated staff (Sophia Bixby, Valerie Nies). I also thank all of the Track Chairs and Session Chairs for their time and efforts. Finally, a special thanks to Debby Tucker for her invaluable assistance and organizational skills and to Ed Schilling who was supportive of our many ideas and requests.

Welcome to Austin and enjoy BMES 2010!

**Christine Schmidt, PhD**

*Annual Fall Meeting Chair*



## Krishnendu Roy, PhD

*Technical Program Chair*

**W**ELCOMETO AUSTIN AND to BMES 2010! On behalf of the Technical Program Committee I would like to extend my warmest welcome to you all. This promises to be one of the largest BMES conferences ever and we have tried to put together a diverse and exciting program for you all. I hope that you will enjoy the excellent scientific content of the meeting and also get a chance to experience Austin.

This year we received 2181 abstract submissions, a 23% increase over last year's, which itself was a record year. In addition we had 228 undergraduate research submissions and a whopping 160 submissions for our first ever "meet the faculty candidate" session. The technical program includes 780 platform presentations and 1373 posters over the three days. Thanks to the significantly larger convention center space we were able to easily accommodate all the accepted oral and poster presentations.

We have increased the number of technical tracks to 14 and have added several focused sessions including a session on "Translational Biomedical Engineering", a special session on the "Acta Biomaterialia Gold Medal Award" and a plenary session on Friday afternoon on "Future Frontiers of Biomedical Engineering." Each track also has significantly more number of platform sessions this year. The focus on undergraduate research has also been extended with two platform sessions and 198 posters.

None of these would have been possible without the enormous dedication of the Track Chairs who volunteered their precious time despite the tight deadlines and my constant pestering! I have tried my best to stay out of their way on deciding the technical content of the meeting. Thanks also to the volunteer reviewers who were given a large load of abstracts with a short time frame. This superb group of members pulled through and organized an excellent set of talks and posters that I am sure you all will find intellectually rewarding.

I would also like to thank my co-chairs for the technical program, James Tunnell, Stas Emelianov and Mauro Ferrari. A very special thanks to Ms. Debby Tucker of BMES, who kept me sane throughout this process and single handedly managed abstract submission, acceptance, notification and program organization. Thanks also to Ed Schilling and the rest of the BMES team for their great support and dedication.

I hope to hear from you about what's good and what's not in the meeting. I will be around as a colleague and participant and please let me know what you would like to see improved. The meetings committee of BMES will value your opinion immensely. I wish you all a great meeting and hope you will have a memorable stay in Austin!

With warm regards

**Krishnendu Roy, PhD**

*Technical Program Chair*

## 2010 ANNUAL MEETING COMMITTEE

### Annual Meeting Chair

Christine E. Schmidt  
*University of Texas, Austin*

### Technical Program Chairs

#### CHAIR:

Krishnendu Roy  
*University of Texas, Austin*

#### CO-CHAIRS:

Mauro Ferrari  
*Texas Medical Center*

Stanislav Emelianov  
*University of Texas, Austin*

James Tunnell  
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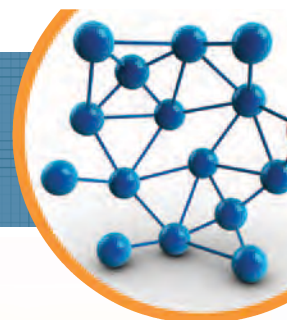
Randi Voss  
*University of Texas, Austin*

### “Meet the Faculty Candidate” Chairs

Jessica Winter  
*Ohio State University*

Elizabeth Cosgriff Hernandez  
*Texas A&M University*

Rebecca Carrier  
*Northeastern University*



# Acta BIOMATERIALIA

## GOLD MEDAL AWARD

We are pleased to announce that Dr. Nicholas A. Peppas is the recipient of the 2010 Acta Biomaterialia Gold Medal Award which will be presented at this year's Biomedical Engineering Society conference. The Award consists of a gold medal, a plaque, an honorarium and travel expenses related to the award ceremony. In conjunction with his receipt of the Award, Dr. Peppas will be presenting a talk entitled: **"Advances in Hydrogels as Intelligent Biomaterials"** at the Award session which will take place on Thursday, October 7th, from 4:00 to 5:30 PM.

Nominations are open for future Acta Biomaterialia Gold Medal Awards.

The requirements and rules for submitting nominations can be found by visiting [www.elsevier.com/locate/actabiomat](http://www.elsevier.com/locate/actabiomat). **The deadline for nominations for the 2012 Acta Biomaterialia Gold Medal Award is December 31, 2010.**

Acta Materialia, Inc. is a non-profit organization dedicated to disseminating the knowledge of science and engineering of materials, primarily by publishing high quality journals covering the areas of materials science, biomaterials, materials engineering, and materials chemistry and physics. The corporation publishes three journals in collaboration with Elsevier: *Acta Materialia*, *Scripta Materialia*, and *Acta Biomaterialia*.



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*Pritzker Distinguished Lecturer:*

## Rebecca Richards-Kortum, PhD

*Department of Bioengineering, Rice University*

THURSDAY, OCTOBER 7, 2010

8:00AM

BALLROOM D, CONVENTION CENTER

### From Cell Phones to Cell Biology: High Tech, Low Cost Solutions for Global Health

**A** **ADVANCES IN THE BIOSCIENCES** and public health are responsible for dramatic gains in life expectancy achieved over the last century. Yet, the majority of the world has not benefited from this progress. Sustainable and scalable innovations to prevent disease are needed. This talk will describe efforts of bioengineering faculty and students to develop new diagnostic and therapeutic tools which can be used at the point-of-care (POC) to improve health in low resource settings.

Advances in MEMS technologies, molecular recognition, and low power sensors now offer the ability to design low-cost, reusable platforms for POC diagnostics. Efforts to integrate molecular imaging together with miniature microscopes are now yielding new POC diagnostics for infectious and chronic diseases. Driven by advances in consumer electronics, high resolution imaging can be obtained with low cost devices; advances in digital signal processing provide the ability to automate analysis.

In parallel, multidisciplinary educational programs are engaging undergraduate students to address POC design problems in developing countries. In creating solutions to real world challenges, students are challenged to think beyond traditional disciplinary and geographic boundaries.

**REBECCA RICHARDS-KORTUM** is the Stanley C. Moore Professor of Bioengineering at Rice University. Previously, she held the Cockrell Family Chair in Engineering #10 and was a Professor of Biomedical Engineering at the University of Texas at Austin, where she was also a Distinguished Teaching Professor. After receiving a B.S. in Physics and Mathematics from the University of Nebraska-Lincoln in 1985, she continued her graduate work at the Massachusetts Institute of Technology, where she received a PhD in Medical Physics in 1990. She joined the faculty in Bioengineering at Rice University in 2005 and served as Chair of Bioengineering from 2005-2008.

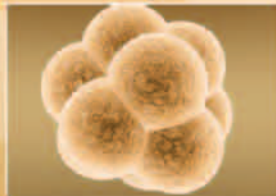
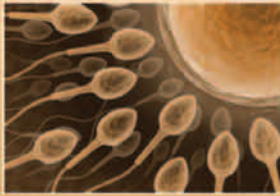
She was named a Howard Hughes Medical Institute Professor in 2002 and 2006, and was elected to the US National Academy of Engineering (2008). She was elected fellow of AAAS and of BMES in 2008, and received the IEEE Educational Activities Board Vice-President Recognition Award (2008).

Dr. Richards-Kortum's research group is developing miniature imaging systems to enable better screening for oral, esophageal, and cervical cancer and their precursors at the point-of-care. In collaboration with faculty at the UT MD Anderson Cancer Center, her group has carried out clinical trials of this technique involving over 2,000 patients in the US, India and Nigeria. Her group is developing contrast agents for in vivo molecular imaging of changes associated with precancer including expression of epidermal growth factor receptors. More recently, her group has worked to integrate advances in nanotechnology and microfabrication to develop novel, low-cost sensors to detect infectious diseases at the point-of-care, including cryptosporidium, malaria, and Tuberculosis.

At Rice University, Dr. Richards-Kortum has worked to establish new educational programs in global health technologies, including a new undergraduate minor in global health technologies at Rice. Students in the minor engage in project based courses to solve problems contributed by partners in developing countries. Students in the program have designed over 28 new technologies which have been used by healthcare providers in 15 international healthcare settings and have impacted the lives of over 19,000 people.

  
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*BMES Distinguished Achievement Lecture Award:*

## Nicholas A Peppas, ScD

*Fletcher Stuckey Pratt Chair in Engineering*

*Professor of Chemical Engineering, Biomedical Engineering and Pharmacy*

*Chair, Department of Biomedical Engineering*

*Director, Center on Biomaterials, Drug Delivery, Bionanotechnology and Molecular Recognition*

*University of Texas, Austin*

FRIDAY, OCTOBER 8, 2010

8:30AM

BALLROOM D, CONVENTION CENTER

## From Drug Delivery and Targeted Therapeutics to Advanced Intelligent Biomedical Devices for Improved Health Care

**D**URING THE EARLY DAYS of drug delivery studies, forty years ago, the field was considered outside of the main scope of biomedical engineering. Yet, major successes in health care and disease treatment through careful engineering design of advanced drug delivery systems led to maturity of the field, where biomedical transport phenomena and bio-polymer development merged to create a generation of general and targeted drug delivery systems for the treatment of a wide range of diseases. These days, successful targeted delivery systems are designed to allow delivery of therapeutic or diagnostic agents to a preferential site. As targeted nanodelivery involves local delivery of therapeutics and diagnostics at disease sites, this method has received considerable attention and is poised to have a significant impact on medicine. Efficient targeted delivery systems allow for a reduced systemic dosage while resulting in relatively higher or more efficient dosing at the target site. Targeted delivery has become a rich field of drug delivery and nanomaterials. Nanoscale materials are a necessity for most targeted delivery systems as they must be allowed to transport through different tissue spaces in order to localize at the target site. The ability of nanoparticles to localize at a target site is dependent on chemical properties, the presence of a targeting ligand, or size. Even with targeted delivery, only a fraction of the administered dose localizes at the target site while the remaining nanoparticles distribute throughout the body. Pharmacokinetics pertaining to the nanodelivery system determine the dose in non-targeted tissues. Understanding of nanoparticle biodistribution and pharmacokinetics is significant in the successful development and translation of targeted delivery systems. The design of optimized targeted delivery systems is based on the drug or agent of interest, the nanoparticle type that allows sufficient loading of the drug, and the physicochemical properties that allow for targeting. We highlight some of this recent work on targeted delivery systems and focus on in vivo performance, localization, and the incorporation of diagnostic and therapeutic agents in targeted delivery systems.

**NICHOLAS A. PEPPAS** is the Fletcher Stuckey Pratt Chair in Engineering, Professor of Biomedical Engineering, Chemical Engineering and Pharmacy, and Chair of the Department of Biomedical Engineering at the University of Texas at Austin. He is a member of the Institute of Medicine of the National Academies, the National Academy of Engineering, the National Academy of Pharmacy of France, and the Texas Academy of Medicine, Engineering and Sciences. Peppas has been a leader in biomaterials, drug delivery and pharmaceutical bioengineering. The multidisciplinary approach of his research blends modern molecular and cellular biology with engineering to generate the next-generation of medical systems and devices for patient treatment. He has been recognized with the Pierre Galletti Award from AIMBE, several awards from AIChE (Founders Award, William Walker Award, Institute Lecture, Bailey Award, Bioengineering Award, Materials Award), Society for Biomaterials (Founders, Clemson and Hall Awards), Controlled Release Society (Founders, Heller and Eurand Awards) and other Societies. He is a fellow of BMES, AIMBE, AIChE, APS, MRS, SFB, CRS, AAPS, AAAS and ASEE. He is the President of the International Union of Societies of Biomaterials Science and Engineering, the Chair-elect of the BME Chairs Council, and a member of the Board of BMES. Peppas has served as President of the Society for Biomaterials and the Controlled Release Society, as Chair of the College of Fellows of AIMBE, and as Director of AIChE. He was the Editor of Biomaterials from 1982 to 2002. Presently, he is Editor-in-Chief of the SFB/Wiley Biomaterials Book Series and Associate Editor of the Cambridge University Press Biomedical Engineering Series, the AIChE Journal and Biomedical Microdevices. He has published 1100 papers and 45 patents and has supervised the research of numerous postdoctoral and graduate students including 88 PhDs, 37 of them presently professors in other Universities. Dr. Peppas holds a Dipl. Eng. from the National Technical University of Athens (1971), a Sc.D. from the Massachusetts Institute of Technology (1973), and honorary doctorates from the University of Ghent, Belgium, the University of Parma, Italy, and the University of Athens, Greece.

**FUTURE FRONTIERS OF BIOMEDICAL ENGINEERING**

*Distinguished Speakers Session:*

FRIDAY, OCTOBER 8, 2010  
4:00PM - 6:00PM  
BALLROOM D, CONVENTION CENTER



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

**George Georgiou, Ph.D.**

*Cockrell Family Regents Chair in Engineering #9  
Institute for Cell and Molecular Biology  
Departments of Biomedical and Chemical Engineering  
The University of Texas at Austin*



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

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

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



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

**Douglas Lauffenburger, Ph.D.**

*Ford Professor of Bioengineering and Head of the Department of Biological Engineering Massachusetts Institute of Technology*



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

**Lihong Wang, Ph.D.**

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

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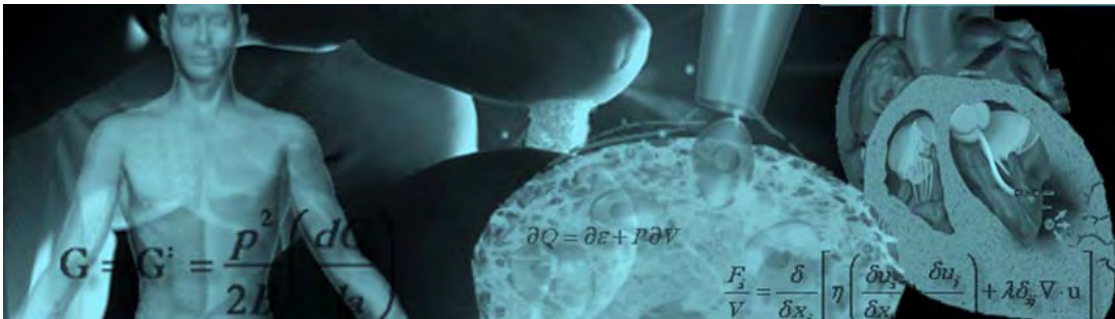
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# Step into the future



*BMES 2010 Rita Schaffer Memorial - Young Investigator Lecturer:*

### **Cynthia Reinhart-King, PhD**

*Assistant Professor, Cornell University*

SATURDAY, OCTOBER 9, 2010

8:00AM

BALLROOM D, CONVENTION CENTER

## How Matrix Properties Control the Self-assembly and Maintenance of Tissues

**T**HE MECHANISM BY which cells organize into tissues is fundamental to developmental biology and tissue engineering. Likewise, disruption of cellular order within tissues is a hallmark of many diseases including cancer and atherosclerosis. Tissue formation is regulated, in part, by a balance between cell-cell cohesion and cell-matrix adhesion. In this lecture, I will discuss my laboratory's investigation into the role of this balance in the formation of vasculature. Specifically, we have found that by decreasing cell-matrix adhesion by either reducing matrix stiffness or matrix ligand density, endothelial cells self-assemble into network-like structures, resembling capillaries. These structures are stabilized by increased localization of VE-cadherin to the cell membrane and the polymerization of the extracellular matrix protein fibronectin. When fibronectin polymerization is inhibited, network formation does not occur. Interestingly this interplay between substrate mechanics, ECM assembly and tissue self-assembly is not limited to endothelial cells, as we have observed it in other cell types as well. These results suggest novel approaches to foster stable cell-cell adhesion and engineer tissues.

**CYNTHIA REINHART-KING** is an Assistant Professor in the Department of Biomedical Engineering at Cornell University, and a member of the graduate faculty in Mechanical and Aerospace Engineering and the Cornell Nanobiotechnology Center. She obtained undergraduate degrees in chemical engineering and biology at MIT. While there, she was awarded the Randolph G. Wei Award for "research at the interface of the life sciences and engineering." As a graduate student at the University of Pennsylvania in the Department of Bioengineering, she received a Whitaker Foundation Graduate Fellowship to support her thesis work on endothelial cell mechanobiology. She then completed postdoctoral training as an Individual NIH NRSA postdoctoral fellow in the Cardiovascular Research Institute at the University of Rochester. Dr. Reinhart-King's current research interests are in the areas of cell-biomaterial interactions, cell mechanics, and vascular cell signaling. Her lab uses a multidisciplinary approach, drawing from cell and molecular biology, biophysics, and biomechanics to quantitatively examine the mechanisms of tissue formation and disease progression. Her lab is funded by the American Heart Association, the National Institutes of Health, and the American Federation of Aging Research, and her recent independent work received a Silver Medal at the 6th World Congress on Biomechanics. She has also received the 2010 Sonny Yau '72 Excellence in Teaching Award, the highest award for teaching in College of Engineering.

*BMES established this award in 2000 to honor Rita M. Schaffer, former BMES Executive Director. Rita's gift of her estate, along with contributions from her family, friends, and associates, has enabled BMES to create the Rita Schaffer Young Investigator Award, which includes the Rita Schaffer Memorial Lecture.*



Diversity Lecture:

## Gilda Barabino, PhD

*Associate Chair for Graduate Students & Professor,  
Wallace H. Coulter Dept. of Biomedical Engineering  
Georgia Institute of Technology and Emory University*

SATURDAY, OCTOBER 9, 2010  
8:45AM  
BALLROOM D, CONVENTION CENTER

### Identity Formation and Career Progression: Differential Experiences for Underrepresented Minorities

**T**HE PERSISTENT underrepresentation of racial and ethnic minorities in the sciences and engineering threatens the nation's welfare and has evaded full elucidation of causative factors and effective solutions. One basic factor that remains largely unexplored is identity formation. The ability of an individual to form an identity as a scientist or engineer and to be socialized into the profession evolves over time and plays a crucial role in academic and professional career progression. Differential identity and socialization experiences for racial and ethnic minorities in comparison with majority individuals are documented and can be attributed to a complex array of interrelated individual, institutional, and structural (policy) factors. Earlier stage events in life and in a career path can impact transitions and have lasting effects on later stages. This lecture will address the topic through the author's experience, touch on the social science literature that can inform much needed discourse, and provide suggestions for potential strategies.

**GILDA BARABINO** is a Professor and Associate Chair for Graduate Studies in the Wallace H. Coulter Department of Biomedical Engineering at Georgia Institute of Technology and Emory University. She recently served as the inaugural Vice Provost for Academic Diversity and is credited with establishing a legacy to strengthen diversity and inclusion at Georgia Tech. Dr. Barabino received her B.S. degree in Chemistry from Xavier University of Louisiana and her Ph.D. in Chemical Engineering from Rice University. After earning her doctorate, she served as a Research Process Engineer at Rohm and Haas Company. Professor Barabino then joined the chemical engineering faculty at Northeastern University where she rose to the rank of Professor and served as Vice Provost for Undergraduate Education. Her research interests include investigation of the influence of fluid mechanical forces on cell and tissue behavior, growth and development in the context of sickle cell disease and orthopedic tissue engineering. Dr. Barabino has an extensive record of leadership and service in the engineering and medical communities. She is a member of the National Institutes of Health (NIH) National Advisory Dental and Craniofacial Research Council, former Treasurer and member of the Board of Directors of the Biomedical Engineering Society (BMES) and member of the Advisory Board of the Committee on the Advancement of Women Chemists. She recently served as a member of the congressionally appointed NIH Sickle Cell Disease Advisory Committee. She is a Fellow of the American Institute for Medical and Biological Engineering and BMES. Dr. Barabino is a recognized innovator, researcher and consultant on faculty development and diversity in science and engineering. She currently directs the NSF Minority Faculty Development Workshop and serves as Principal Investigator on the NSF ADVANCE Leadership Award, "Cross-Disciplinary Initiative for Minority Women Faculty," an initiative designed to enhance the socialization of tenure-track minority women into academic careers in engineering.

**Announcing the 2011**

# **Coulter Translational Research Awards**

**Now open to all BME faculty**

The **Coulter Translational Research Award** provides funding to support biomedical research with the goal of accelerating innovations toward commercial development and improving patient care.

**The Foundation invites applications  
for up to \$500,000 in funding.**

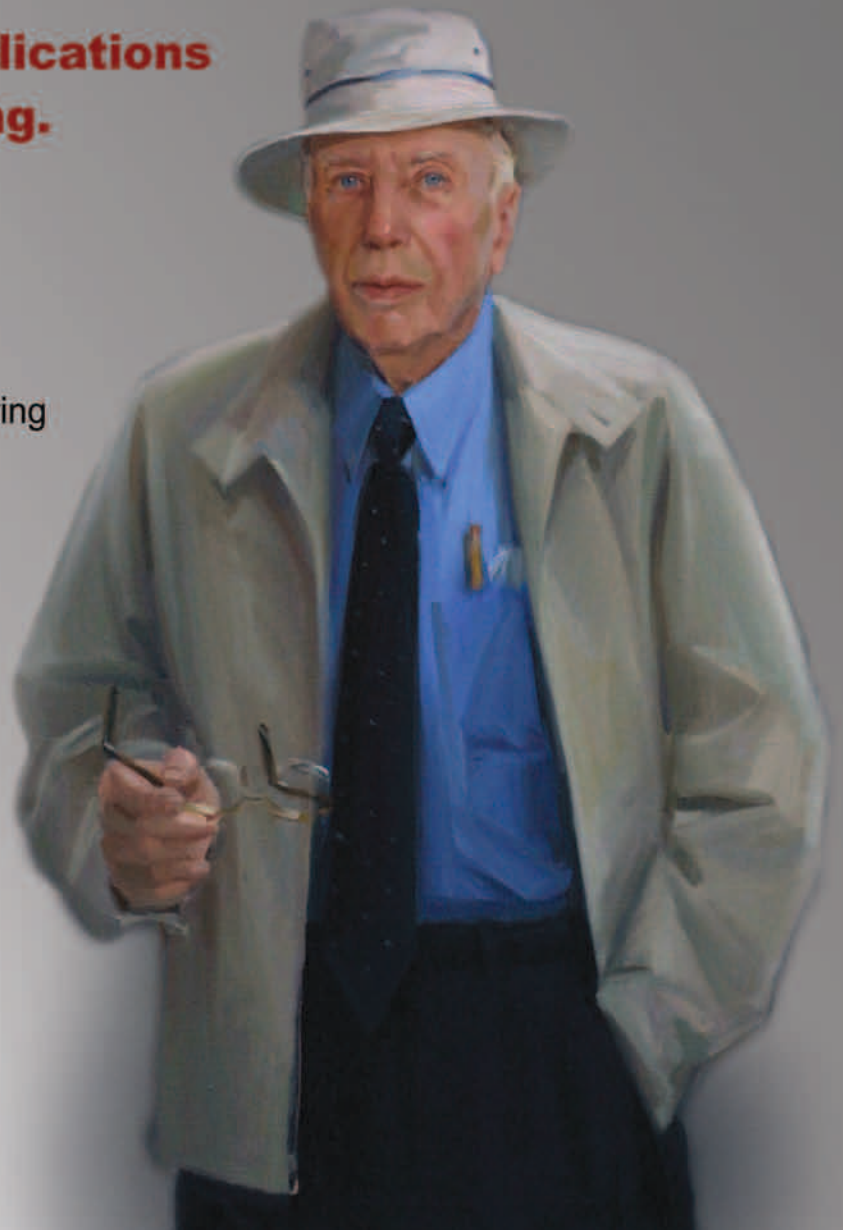
Qualifications include:

- Full-time, tenure-track faculty
- Primary or secondary appointment  
in Biomedical Engineering / Bioengineering  
Departments in the United States

On-line pre-application process open

December 1, 2010 - January 8, 2011.

**For more details, visit [www.whcf.org](http://www.whcf.org).**





# Congratulations

# 2010 Coulter Fellows

For successfully completing the requirements of the Coulter Translational Research Award in Biomedical Engineering.

- **Xudong Fan** - University of Michigan
- **Erin Lavik** - Case Western Reserve University
- **Anant Madabhushi** - Rutgers University
- **Samuel Sia** - Columbia University
- **James Tunnell** - University of Texas at Austin
- **Yingxiao Wang** - University of Illinois, Urbana-Champaign
- **Changhuei Yang** - California Institute of Technology



**Top left:** Anant Madabhushi, James Tunnell, Samuel Sia, Changhuei Yang

**Lower Left:** Erin Lavik, Yingxiao Wang, Xudong Fan



# GENERAL INFORMATION & PRESENTER INFORMATION

## Meeting Location

### Austin Convention Center

500 East Cesar Chavez Street  
Austin, TX 78701  
512-404-4000

### Hilton Austin - Headquarters

500 East 4th Street  
Austin, Texas 78701  
512-482-8000

## Registration

Paid registration is required for admission to all meeting functions including scientific sessions, posters, exhibits, breaks and the Special Event at the Bullock Museum. BMES cancellation policy may be found on any registration form. Any applicable refunds will be issued post-meeting. Substitutions are permitted with written permission from the original registrant. Pre-conference workshop fees, additional social event tickets including the Celebration of Minorities in BME Luncheon, Women in BMES Luncheon are separate and above BMES meeting registration.

## On-Site Registration Hours

Wednesday, October 6	7:00am – 6:00pm
Thursday, October 7	7:00am – 6:00pm
Friday, October 8	7:00am – 6:00pm
Saturday, October 9	7:00am – 2:00pm

## Refreshment Breaks

Please note that your meeting registration includes morning and afternoon refreshments breaks and the Special Event at the Bullock Museum. All refreshment breaks will be in Exhibit Hall 4.

## Exhibits

*Hall 4, Convention Center*

Exhibits are located in the Hall 4 on the first level of the Convention Center. Exhibits will be open:

Thursday, October 7	9:30am – 5:00pm
Friday, October 8	9:30am – 5:00pm
Saturday, October 8	9:30am – 1:30pm

## Poster Sessions

*Hall 4, Convention Center*

Posters are located in Hall 4 on the first level of the Convention Center. Posters are numbered with a card corresponding to the number assigned in the program. Authors should be present during Poster Sessions as indicated in the Scientific Program.

## BMES Presenter Information

### Platform Presentations

Each technical session room will be equipped with a PC-compatible computer with a USB port and PowerPoint along with an LCD projector, screen and a lectern with microphone.

During the half hour before your session begins, please upload your presentation onto the computer using a memory stick or flash drive. Because of the potential difficulty transferring some Mac files to PC format, we encourage you to avoid use of animation if there is a question about transferability.

Please do not try to connect your own laptop. Please note, it will not be possible to provide special equipment. Any additional equipment will need to be supported by the presenter. There will not be internet connections in the presentation rooms.

Sessions chairs should keep sessions on the listed schedule so that attendees can move back and forth among sessions. In most cases, presentation should be done in twelve minutes, allowing three minutes for questions and answers and transition to the next speaker.

### Poster Presentations

Posters will be presented Thursday, Friday and Saturday. Posters for both the morning and afternoon sessions will be on display throughout the entire day and should be manned by the author during the time indicated in the Scientific Program, especially during the breaks between platform sessions. All posters will be in Hall 4 on the first level of the Convention Center. Posters are numbered with a card corresponding to the number assigned in the program.

### Speaker Ready Room

*Room 13A (Level 4), Convention Center*

In the BMES Speaker Ready Room you will find cables, LCD projector and screen to practice your presentation. Please bring your own laptop.

Wednesday, October 6	1:00pm – 5:00pm
Thursday, October 7	7:00am – 5:00pm
Friday, October 8	7:00am – 5:00pm
Saturday, October 9	7:00am – 3:30pm

## Program Highlights

*Don't Miss These Events*

**THURSDAY, October 7**

### Celebration of Minorities in BME Luncheon\*

12:00noon - 1:30pm

*Hilton Austin, Salon G*

New event sponsored by the BMES Diversity Committee to create a community and network within the Society that fosters support and professional development of minorities in BMES at all levels from student to professor, intern to product manager, and beyond. Everyone is invited to attend, as diversity only increases when all groups play a part. This luncheon complements the Diversity Award lecture to be delivered on Saturday and the Women in BMES Networking Luncheon on Friday.

**Speaker:** Raphael C. Lee, MD, ScD, DSc (Hon),  
Paul and Allene Russell Professor of Surgery, University of Chicago

\* additional registration and \$20 ticket required

### BMES Business Meeting, Fellows Induction & Awards Ceremony

5:30pm – 7:00pm

*Convention Center, Ballroom D*

A full report to the society at large on administrative, financial, membership and strategic initiatives will be reported by BMES President George Truskey. The BMES Awards will also be presented. See page 22 for the award winners.

### Welcome Reception

7:30pm - 8:30pm

*Hilton Austin, Salon JK*

Light refreshments will be served.

**FRIDAY, October 8**

### Women in BMES Luncheon\*

12:00noon - 1:30pm

*Hilton Austin, Salon AB*

Featuring a panel discussion titled "Juggling Motherhood and a Career in Bioengineering." Networking events for women in BMES create a community within the Society that fosters support and professional development, while offering opportunities to nourish old ties and forge new relationships. Women in BMES activities have made a visible impact at the meeting, creating a forum for exchange across disciplines, between industry and academia, and between senior leaders in the field and junior faculty, trainees, and students.

\* additional registration and \$20 ticket required

**SPECIAL EVENT**

### Bob Bullock Texas State History Museum

Round trip bus transportation will run from the Hilton to the Bullock Museum from 6-10pm.

6:30pm - 9:30pm

*1800 N. Congress Avenue at the intersection  
of Martin Luther King, Jr. Blvd., Austin, Texas.*

Buses will run continuously from the Hilton Hotel to the Bullock Museum from 6pm to 10pm. All full and guest registrations receive a ticket for the event that includes food and one drink ticket. A cash bar will be available. Additional tickets may be purchased for \$100 each.

### **BMES Career Development**

Wednesday, October 6

**3:00pm - 5:00pm**

*Convention Center, Exhibit Hall 4*

### **Meet the Faculty Candidate Poster Session** **NEW THIS YEAR!**

This event will provide an opportunity for faculty, recruiters, and Department Chairs to speak directly with current graduate students and postdoctoral researchers who are seeking faculty positions. More than 150 faculty candidates will be presenting.

Thursday, October 7

**4:00pm – 5:30pm**

*Convention Center, Ballroom E*

### **BME Alumni Panel**

BME alumni share their industry experiences and lessons learned to the audience.

**5:45pm – 7:15pm**

*Convention Center, Ballroom E*

### **Resume Writing Workshop**

Students and early career alike can participate and take away writing tips from career professionals representatives.

Friday, October 8

**1:00pm – 4:00pm**

*Convention Center, Exhibit Hall 4*

### **Career Fair** **OPEN TO ALL ATTENDEES**

Employers and candidates come together at The Biomedical Engineering Society (BMES) Career Fair. This event is designed to connect organizations looking to hire high-level people with candidates that can bring specialized knowledge and innovation to new product and process development, teaching/training, scientific research, critical resource management, and more. Many of these BMEs are at the cutting edge of such areas as high-speed electronics, sophisticated mathematical analysis, sensors, safety studies, and massive data storage and processing.

### **BMES Student Chapter Development Meeting**

Friday, October 8

**10:00am – 11:30am**

*Convention Center, Ballroom E*

### **BMES Student Leadership Meeting**

Friday, October 8

**1:30pm – 2:30pm**

*Convention Center, Ballroom E*

This workshop will be for those students that are interested in enhancing their leadership skills and/or their involvement with BMES at a national level. Various leadership methods and techniques will be discussed. Students' newly acquired leadership skills will then be applied to the development of community, a vision, and a plan of action for the BMES national student leadership.

### **REU / Summer Undergraduate Technical Sessions**

Saturday, October 9

*Convention Center, Room 13B*

There will be two Undergraduate Research platform sessions on Saturday, October 9 featuring eleven oral presentations. See pages 131 and 137 for details. The presentations in these sessions were chosen from submissions of undergraduates during the summer of 2010. Almost 200 posters will also be presented on Saturday morning from 9:30am to 1:00pm. See pages 118 to 125.

### **Whitaker International Fellows and Scholars Program**

Thursday, October 7

**10:30am - 12:00noon**

*Hilton Austin, Room 602*

This session will present the Whitaker International Fellows and Scholars Program which provides funding opportunities to emerging U.S.-based leaders in biomedical engineering, with a goal of building international bridges. Grant projects – including research, coursework, public policy work – are intended to enhance both the recipient's career and the BME field.

## Alpha Eta Mu Beta (AEMB) Programs

### Alpha Eta Mu Beta Annual Grand Meeting

Thursday, October 7

1:00pm - 3:00pm

Hilton Austin, Room 602

**Session Chair:** Melodie Benford

Alpha Eta Mu Beta (AEMB), the national biomedical engineering honors society, will host its annual grand meeting at the 2010 BMES conference. During this time, we will undergo strategic planning for the year as well as provide leadership training and opportunities for the student leaders of local chapters to become involved in outlining the direction of the Society. We also brainstorm and discuss prospective events and fundraising ideas for local chapters, such as hosting local ethics seminars and selling AEMB apparel. This year we will hold national elections for the executive board of Alpha Eta Mu Beta. Attendance is mandatory for all AEMB members.

### AEMB Ethics Session

Friday, October 8

10:00am - 11:00am

Hilton Austin, Room 602

### Ethical Considerations of Animal Use in Biomedical Engineering Research

**Session Co-Chairs:** C. Polito, MS, D.E. Nathan, MS and B.L. Vernon, PhD

Animal research is an important aspect of biomedical engineering that presents a robust platform to understand normal function and disease in living organisms. The utilization of animal models that represent specific human physiological systems and pathologies, have provided critical insight for the development of effective therapeutic solutions. Although animals are used extensively in biomedical research, ethical considerations are often not adequately addressed in education and training curriculums. This session will provide students and researchers with a frame work for understanding the scientific considerations, ethical limits, risk factors and costs associated with animal use in biomedical engineering research. In addition, community views and concerns pertaining to animal research are explored through the use of case studies and interactive discussions. A summary report of this session will be disseminated through Alpha Eta Mu Beta, the National Biomedical Engineering Honor Society and BMES newsletters. This report will encourage AEMB members to develop bioengineering ethics sessions at their respective institutions and, to inculcate and encourage continued awareness of the importance of ethics and Biomedical Engineering at their AEMB chapter meetings.

### How Public Policy Affects You (Sponsored by AIMBE and AEMB)

Friday, October 8

2:30pm - 3:30pm

Hilton Austin, Room 602

**Session Co-Chairs:** Jennifer Ayers and Teresa Murray

What government entities impact, or will shortly impact, your work as a biomedical engineer? How does this affect public health? Moreover, how can you influence policy? Find the answers at this informative session co-hosted by Alpha Eta Mu Beta (AEMB), the National Biomedical Engineering Honor Society, and the American Institute for Medical and Biological Engineering (AIMBE).

AIMBE is the leading voice for public policy supporting medical and biological engineering innovation to improve public health. During this session, we will demonstrate how advocacy for the profession and the field can have important personal impact and ensure public policy continues to support our work. Furthermore, you will learn about the different types of advocacy and how you can be involved.

AIMBE represents the top 2% of medical and biological engineers in the field, biomedical and bioengineering university programs through the US, industry and 18 professional societies. It plays a critical role in advancing public policy for medical and biological engineering by meeting regularly with key administration officials, Congress, and monitoring trends in public policy that may impact the field. In total we reach nearly 50,000 individuals who are leading the way towards improved medical and biological engineering interventions for human health and well-being.

AEMB members represent the top BME students across the US. Starting in 2006, they have sponsored the Student Ethics Session training future BMEs to evaluate the broader impacts of emerging biomedical innovations.

## 2010 BMES Awards Recipients

One of the more important – and most enjoyable – tasks of the Society is to recognize contributions to the intellectual and professional development of the field of biomedical engineering. On behalf of the awards committee we would like to thank all the members who submitted nominations and provided letters of support and for the high quality of their nominees. Congratulations to the following award winners.

### BMES Robert A. Pritzker Distinguished

**Rebecca Richards-Kortum, PhD**  
*Rice University*

### BMES Distinguished Lecture

**Nicholas A. Peppas, ScD**  
*University of Texas at Austin*

### BMES-Rita Schaffer Young Investigator Lecture

**Cynthia Reinhart-King, PhD**  
*Cornell University*

### BMES Diversity Lecture

**Gilda Barabino, PhD**  
*Georgia Institute of Technology*

### BMES Distinguished Services

**Frank Yin, PhD**  
*Washington University at St. Louis*

## BMES Extended Abstract Awards for:

### Graduate Student

**Mira Amiram**  
*Duke University*

**Alice A. Chen**  
*Massachusetts Institute of Technology*

**Stephan Kontos**  
*Ecole Polytechnique Fédérale de Lausanne (EPFL)*

**Casey M. Kraming-Rush**  
*Cornell University*

**Kristen Marie Lorentz**  
*Ecole Polytechnique Fédérale de Lausanne (EPFL)*

**Sri R. Madabhushi**  
*State University of New York at Buffalo*

**Nikhil N. Mutyal**  
*Northwestern University*

**Joseph O'Doherty**  
*Duke University*

### Undergraduate Students

**Alex Lindburg**  
*Clemson University*

**Sonia G. Parra**  
*Yale University*

**Melissa Tsang**  
*Brown University*

**Justin R. Tse**  
*University of California at San Diego*

## Additional Meetings

### BMES Board of Directors Meeting

Wednesday, October 6

8:30am – 4:30pm

Hilton Austin, Salon AB

**Organizer:** George Truskey

### Council of Chairs of Biomedical Engineering and Bioengineering Meeting & Dinner

Wednesday, October 6

5:30pm - 9:30pm

University of Texas, BME Building

**Organizer:** Nicholas Peppas

### BMES Meetings Committee Luncheon

Thursday, October 7

12:00noon – 1:30pm

Convention Center, Room 13B

**Organizer:** David Vorp

### AIMBE Industry Tech Transfer Meeting

Thursday, October 7

1:30pm – 4:30pm

Hilton Austin, Room 401

**Organizer:** Matthew Houliston

### CVET Editorial Board Lunch

Thursday, October 7

12noon - 1:30pm

Marriott Austin Downtown Courtyard, Rio Grande A

**Organizer:** Michael Weston

### ABME Editorial Board Dinner

Thursday, October 7

7:30pm – 10:00pm

Marriott Austin Downtown Courtyard, Rio Grande A

**Organizer:** Michael Weston

### 2011 BMES Annual Meeting Committee Meeting

Friday, October 8

9:30am - 11:00am

Convention Center, Room 13B

**Organizer:** Tom Webster

### AIMBE Academic Council Meeting

Friday, October 8

10:00am –12noon

Hilton Austin, Room 406

**Organizer:** Matthew Houliston

### CMBE Editorial Board Lunch

Friday, October 8

12noon - 1:30pm

Marriott Austin Downtown Courtyard, Rio Grande A

**Organizer:** Michael Weston

### 2011-2013 BMES Orientation & Board of Directors Meeting

Saturday, October 9

10:00am – 2:30pm

Hilton Austin, Salon AB

**Organizer:** George Truskey

**COME SEE YOUR FAVORITE  
BIOENGINEERING PROFESSORS  
ROCK OUT! *Not an official BMES event*  
BEDrock – Live at Red 7**

Thursday, October 7 at 10pm

611 East 7th St. (near the intersection with Red River)

Austin, TX 78701

(512) 476-8100

[www.red7austin.com](http://www.red7austin.com)

Info, Jimmy Moore

[jmoorej@bme.tamu.edu](mailto:jmoorej@bme.tamu.edu)

## HOSTED RECEPTIONS & STUDENT CHAPTERS

### Hosted Receptions

*(by invitation only)*

Thursday, October 7

Hilton Austin

8:00pm - 9:30pm

#### **Boston University**

Liberty Tavern

#### **Case Western Reserve University**

Room 412

#### **Cornell University Biomedical Engineering**

Salon D

#### **Marquette University**

Room 410

#### **MIT/Translational Health Science & Technology Institute**

Room 415

#### **Rensselaer Polytechnic Institute**

Room 408

#### **Rice University**

Room 602

#### **University of California, Berkeley**

Room 402

#### **University of California, San Diego**

Salon B

#### **University of Illinois at Urbana-Champaign**

Salon A

#### **University of Michigan**

Room 404

#### **University of Pittsburgh**

Room 400

#### **University of Texas, Austin**

Salon E

#### **University of Washington**

Please note hotel - Marriott Courtyard, Brazos Room

#### **Vanderbilt University**

Room 406

### Student Chapter Tables

**NEW THIS YEAR!**

Convention Center, Exhibit Hall 4

Stop by to see BMES Student Chapters showcase their activities and materials.

#### **Carnegie Mellon University**

#### **Cornell University**

#### **Georgia Institute of Technology**

#### **Johns Hopkins University**

#### **Louisiana Tech University**

#### **Michigan State University**

#### **Michigan Technological University**

#### **Pennsylvania State University**

#### **Purdue University**

#### **Rice University**

#### **San Jose State University**

#### **The College of New Jersey**

#### **University of Arizona**

#### **University of California at San Diego**

#### **University of California, Davis**

#### **University of California, Riverside**

#### **University of Michigan**

#### **University of Pittsburgh**

#### **University of Rochester**

#### **University of Southern California**

#### **University of Tennessee Health Science Center**

#### **University of Virginia**

#### **University of Wisconsin - Madison**

#### **Virginia Tech - Wake Forest University**

#### **Worcester Polytechnic Institute**





# Whitaker International Fellows And Scholars Program

## Grants For Biomedical Engineering Study or Research Abroad

The **Whitaker Program** provides young biomedical engineers the opportunity to expand their geographic and academic horizons

Potential activities to pursue overseas include:

- conducting research at an academic institution
- interning at a policy institute
- establishing ties between home and host institutions
- pursuing post-doctoral work

For more information, including program details, application requirements, and the online application, visit our website.

**DEADLINE:**  
**January 24, 2011**

[www.whitaker.org](http://www.whitaker.org)

INSTITUTE OF  
INTERNATIONAL  
EDUCATION

Institute of International Education  
809 United Nations Plaza  
New York, NY 10017

## Pre-Conference Workshops

Wednesday, October 6

*Additional registration required*

8:00am - 5:00pm

*Convention Center, Room 12A*

### Industry-Academia-Clinician Collaboration for Medical Innovation: Reinventing the Wheel

The workshop will be organized as a full-day panel with six to eight key opinion leaders from industry, academia and clinical medicine (IAC). Each panelist will present a 20 minute talk. The speakers will present several case studies of IAC relationships that work(ed) and then answer questions from the audience on how to overcome their current challenges. Some examples of the specific topics to be covered are: intellectual property protection and sharing, prototype design and execution, and patent licensing/company formation. An area of focus for this workshop will be the experienced and anticipated implications of new conflict of interest measures which may result in significant limitation of clinician's involvement in the development process.

8:00am - 2:30pm

*Convention Center, Room 12B*

### BME Council of Chairs Educational Workshop

Historically there has been a great deal of interest in the biomedical engineering education community in developing consensus on what the content of undergraduate curricula should look like. This interest has been largely motivated by the concern that industry does not appreciate what a B.S. graduate of a biomedical engineering program can do for them. There is continued frustration in some segments of the community that in spite numerous educational summit meetings and workshops over the past decade that this problem still persists. This workshop will take a different approach to addressing this problem. Rather than addressing the topical content of the curriculum, which typically limits discussion to the lowest levels of Bloom's taxonomy, this workshop will focus on the educational outcomes for undergraduate biomedical engineering programs. These outcomes generally emphasize the higher levels of Bloom's taxonomy that are more easily translated into language that industry can relate to. To help facilitate this process, workshop participants will include industry representatives from a broad spectrum of companies that employ biomedical engineers. The workshop will concentrate on examining the integration of life and engineering sciences within the curriculum in the following areas to develop statements of outcomes the participants believe should be demonstrated by all graduates of B.S. biomedical engineering programs:

**Laboratories:** conducting experiments, developing experimental protocols and analyzing/interpreting data

**Problem solving:** identifying, formulating and solving

**Modeling:** applying knowledge of mathematics, applying knowledge of life sciences and utilizing computational tools

## Biomedical Engineering Education

**Melissa Micou**  
*University of California San Diego*

**Monty Reichert**  
*Duke University*

## Biomedical Imaging & Optics

**Rebekah Drezek**  
*Rice University*

**Katherine Ferrara**  
*University of California, Davis*

## Cardiovascular Engineering

**Jane Grande-Allen**  
*Rice University*

**Michael Sacks**  
*University of Pittsburgh*

## Cellular and Molecular Engineering

**Andres Garcia**  
*Georgia Tech*

**Laura Segatori**  
*Rice University*

## Devices: Nano to Micro

**Tejal Desai**  
*University of San Francisco*

**John Zhang**  
*University of Texas at Austin*

## Drug Delivery and Intelligent Systems

**Justin Hanes**  
*Johns Hopkins/University of North Carolina*

**Suzie Pun**  
*University of Washington*

## Neural Engineering

**Warren Grill**  
*Duke University*

**Erin Lavik**  
*Case Western University*

## New Frontiers in Bioengineering

**Christina Smolke**  
*Stanford University*

**Melody Swartz**  
*EPFL*

## Orthopedic and Rehabilitation Engineering

**Rena Bizios**  
*University of San Antonio*

**John Fisher**  
*University of Maryland College Park*

## Respiratory Engineering

**Jim Grotberg**  
*University of Michigan*

**Geoffrey Maksym**  
*Dalhousie University*

## Systems Biology, Bionformatics and Computational Biology

**Orly Alter**  
*University of Utah*

**Jeremy Gunawardena**  
*Harvard University*

**Pengyu Ren**  
*University of Texas at Austin*

## Tissue Engineering

**Jennie Leach**  
*University of Maryland*

**Tony Mikos**  
*Rice University*

## Translational Biomedical Engineering

**Dan Anderson**  
*MIT*

## Undergraduate Research (REU)

**James Sweeney**  
*Florida GCU*

**Rebecca Kuntz Willits**  
*St. Louis University*

## Thank you to our reviewers for their time and effort.

### Biomedical Engineering Education

Timothy Allen  
Gilda Barabino  
Kristen Cardinal  
Donna Ebenstein  
Jennifer Elisseeff  
Aura Gimm  
Dan Hammer  
Robert Malkin  
Larry McIntire  
Melissa Micou  
Sriram Neelamegham  
Elizabeth Orwin  
Cynthia Paschal  
Buddy Ratner  
William Reichert  
Rebecca Richards-Kortum  
Kristina Ropella  
Robert Roselli  
Ann Saterbak  
Rachel Schmedlen  
Scott Simon  
Joseph Tranquillo  
David Wootton  
Conrad Zapanta

### Biomedical Imaging & Optics

Gang Bao  
Jonathan Butcher  
Simon Cherry  
Rebekah Drezek  
Jennifer Elisseeff  
Stanislav Emelianov  
Katherine Ferrara  
Robert Guldborg  
Dan Hammer  
Kent Leach  
Angie Louie  
Laura Marcu  
Larry McIntire  
Sriram Neelamegham  
Sarah Nelson  
Kathy Nightingale  
Mark Pierce  
Buddy Ratner  
Kristina Ropella  
Chris Rylander  
Nichole Rylander  
Scott Simon  
Brian Sorg  
Tomasz Tkaczyk  
Andrew Tsourkas

### Cardiovascular Engineering

Guillermo Ameer  
Nenad Bursac  
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### Cellular and Molecular Engineering

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### Devices: Nano to Micro

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## Drug Delivery and Intelligent Systems

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## Neural Engineering

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## New Frontiers in Bioengineering

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## Respiratory Engineering

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 Tilo Winkler

## ABSTRACT REVIEWERS

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### Systems Biology, Bionformatics and Computational Biology

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### Tissue Engineering

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### Translational Biomedical Engineering

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### Undergraduate Research (REU)

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### Undergraduate Research

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THURSDAY, OCTOBER 7  
TODAY'S HIGHLIGHTS

**PLENARY SESSION**  
8:00am - 9:30am  
Ballroom D, Convention Center

**Robert A. Pritzker**  
Distinguished Lecture  
Rebecca Richards-Kortum, PhD  
Rice University

**EXHIBIT HALL OPEN** 9:30am - 5:00pm  
Exhibit Hall 4, Convention Center

**POSTER SESSION 7A** 9:30am - 1:00pm  
Exhibit Hall 4, Convention Center

**PLATFORM SESSIONS 7-1** 10:30am - 12:00noon  
See pages 45-50, Convention Center

**Celebration of Minorities  
in BME Luncheon** 12:00noon - 1:30pm  
Additional ticket purchase required  
Salon G, Hilton

**PLATFORM SESSIONS 7-2** 1:30pm - 3:00pm  
See pages 63-68  
Convention Center

**POSTER SESSION 7B** 1:30pm - 5:00pm  
Exhibit Hall 4, Convention Center

**PLATFORM SESSIONS 7-3** 4:00pm - 5:30pm  
See pages 69-73  
Convention Center

**CAREER ALUMNI PANEL** 4:00pm - 5:30pm  
Ballroom E, Convention Center

**RESUME WRITING  
WORKSHOP** 5:45pm - 7:15pm  
Ballroom E, Convention Center

**BMES Business Meeting  
& Award Ceremony** 5:45pm - 7:15pm  
Ballroom D, Convention Center

**WELCOME RECEPTION** 7:30pm - 8:30pm  
Salon JK, Hilton

## Track: Biomedical Engineering Education – PS-7A-1

**Community Partnerships: Innovation in Engineering Education**

**PS-7A-1-1** Low Cost Seizure Simulation Bed for Medical Training  
J. H. MCISAAC<sup>1</sup>, J. PALLADINO<sup>2</sup>, W. SISSON<sup>3,4</sup>, B. LAWLER<sup>3,5</sup>, M. EBRAHEEM<sup>2</sup>, M. POWERS<sup>2</sup>, AND S. ZERBINI<sup>3,6</sup>

<sup>1</sup>Univ. of CT/Hartford Hospital, Avon, CT, <sup>2</sup>Trinity College, Hartford, CT, <sup>3</sup>Hartford Hospital, Hartford, CT, <sup>4</sup>Rensselaer Polytechnic Institute, Troy, NY, <sup>5</sup>Duke University, Durham, NC, <sup>6</sup>Wheaton College, Norton, MA

**PS-7A-1-2** The Advantages of a Teaching Partnership between a Science Expert and Teachers in the GK-12 Classroom

L. H. NGUYEN<sup>1</sup>, C. ELLARD<sup>2</sup>, AND A. LYON<sup>3</sup>

<sup>1</sup>University of Texas at Austin, Austin, TX, <sup>2</sup>Pillow Elementary, Austin, TX, <sup>3</sup>Burnet Middle School, Austin, TX

**PS-7A-1-3** Student Involvement in Engineering Education: A Case Study of the Student Platform for Engineering Education Development (SPEED)

D. DELAINE<sup>1</sup>, S. B. SEIF-NARAGHI<sup>2</sup>, S. AL-HAQUE<sup>3</sup>, N. WOJEWODA<sup>4</sup>, Y. MENINATO<sup>5</sup>, AND J. DEBOER<sup>6</sup>

<sup>1</sup>Drexel, Philadelphia, PA, <sup>2</sup>University of California, San Diego, La Jolla, CA, <sup>3</sup>University of Toronto, Toronto, Ontario, Canada, <sup>4</sup>Student Platform for Engineering Education Development, Spoleto, Italy, <sup>5</sup>Technische Universiteit Eindhoven, Eindhoven, Netherlands, <sup>6</sup>Vanderbilt University, Nashville, TN

**PS-7A-1-4** Micro-CT Scanner Training in a 3D Virtual World: Second Life Aided Training and Education (SLATE)

S. J. LEE<sup>1</sup>, K. S. SHARMA<sup>1</sup>, E. A. FOX<sup>1</sup>, AND G. WANG<sup>1</sup>

<sup>1</sup>Virginia Tech, Blacksburg, VA

**PS-7A-1-5** An Outreach Experience: Developing Scientific Minds through Lessons in Embryonic Development

P. BUSKOHL<sup>1</sup>, A. BRITTENHAM<sup>2</sup>, AND J. T. BUTCHER<sup>1</sup>

<sup>1</sup>Cornell University, Ithaca, NY, <sup>2</sup>Elmcrest Children's Center, Syracuse, NY

**PS-7A-1-6** Using Team-based Design to Improve Surgical Safety in the Operating Room (OR)

J. J. KANG-MIELER<sup>1</sup>, D. W. GATCHELL<sup>1</sup>, AND J. WHITE<sup>2</sup>

<sup>1</sup>Illinois Institute of Technology, Chicago, IL, <sup>2</sup>Advocate Lutheran General Hospital, Park Ridge, IL

**PS-7A-1-7** Partnering with K-12 Teachers to Produce Tissue Engineering Class Modules

C. CASS<sup>1</sup>, C. GOMILLION<sup>1</sup>, B. HUNGERFORD<sup>2</sup>, AND K. BURG<sup>1</sup>

<sup>1</sup>Clemson University, Clemson, SC, <sup>2</sup>TL Hanna High School, Anderson, SC

## Track: Biomedical Engineering Education – PS-7A-2

**Graduate Education**

**PS-7A-2-8** Clinical Engineering at the University of Toronto: 25 Years in the Making

T. CHAU<sup>1</sup>, AND P. STASZUK<sup>1</sup>

<sup>1</sup>University of Toronto, Toronto, Ontario, Canada

## Track: Biomedical Engineering Education – PS-7A-3

**Instructional Strategies in Global Health**

**PS-7A-3-9** Impact of International Service Learning on Engineering Students

C. B. PASCHAL<sup>1</sup>

<sup>1</sup>Vanderbilt University, Nashville, TN



**PS-7A-3-10** Engineering World Health: A World of Opportunity for Engineering StudentsM. D. BEARD<sup>1</sup>, AND J. P. COOPER<sup>1</sup><sup>1</sup>Engineering World Health, Durham, NC**Track: Biomedical Imaging and Optics – PS-7A-4****Imaging in Cancer****PS-7A-4-11** Fluorescent Deoxyglucose to Improve Breast Cancer Visualization in Breast Conservation TherapyR. J. LANGSNER<sup>1,2</sup>, L. MIDDLETON<sup>2</sup>, R. DREZEK<sup>1</sup>, AND T-K. YU<sup>2</sup><sup>1</sup>Rice University, Houston, TX, <sup>2</sup>University of Texas, MD Anderson Center, Houston, TX**PS-7A-4-12** Multimodal Optical Coherence Tomography and Fluorescence Lifetime Imaging combined system for diagnosis of oral cancerS. SHRESTHA<sup>1</sup>, J. PARK<sup>1</sup>, B. E. APPLGATE<sup>1</sup>, P. PANDE<sup>1</sup>, AND J. A. JO<sup>1</sup><sup>1</sup>Texas A&M University, College Station, TX**PS-7A-4-13** Automated Calculation of Ptois on Clinical PhotographsE. KIM<sup>1</sup>, J. LEE<sup>2</sup>, E. K. BEAHM<sup>3</sup>, M. A. CROSBY<sup>3</sup>, G. P. REECE<sup>3</sup>, AND M. K. MARKEY<sup>1</sup><sup>1</sup>The University of Texas Department of Biomedical Engineering, Austin, TX, <sup>2</sup>Department of Electrical and Computer Engineering, The University of Texas at Austin, Austin, TX,<sup>3</sup>Department of Plastic Surgery, The University of Texas M. D. Anderson Cancer Center, Houston, TX**PS-7A-4-14** Spatiotemporal Temporal Temperature and Cell Viability Measurement Analysis of Nanohorn Photoabsorbers for Use in Photothermal TherapyJ. WHITNEY<sup>1</sup>, B. WILL<sup>1</sup>, C. ZAWASKI<sup>1</sup>, H. DORN<sup>1</sup>, D. GEOHEGAN<sup>2</sup>, AND M. N. RYLANDER<sup>1</sup><sup>1</sup>Virginia Tech, Blacksburg, VA, <sup>2</sup>Oak Ridge National Laboratory, Oak Ridge, TN**PS-7A-4-15** Human Breast Tumor Co-registration of Optical Coherence Tomography and Biomedical Imaging ModalitiesJ. SUN<sup>1</sup>, S. G. ADIE<sup>1</sup>, AND S. A. BOPPART<sup>1</sup><sup>1</sup>University of Illinois at Urbana-Champaign, Champaign, IL**PS-7A-4-16** Gadolinium-Conjugated Dendrimer Nanoclusters as a Tumor-Targeted T1 Magnetic Resonance Imaging Contrast AgentZ. CHENG<sup>1</sup><sup>1</sup>University of Pennsylvania, Philadelphia, PA**PS-7A-4-17** Size-tunable Fluorescent Probes: Encapsulation of Quantum Dots Within Polymeric MicellesL. CHOU<sup>1</sup>, AND W. CHAN<sup>1</sup><sup>1</sup>Donnelly Centre for Cellular and Biomolecular Research, University of Toronto, Toronto, Ontario, Canada**PS-7A-4-18** Computer-aided Detection of Spiculated MassesA. K. HU<sup>1</sup>, G. S. MURALIDHAR<sup>1</sup>, A. C. BOVIK<sup>1</sup>, AND M. K. MARKEY<sup>1</sup><sup>1</sup>The University of Texas at Austin, Austin, TX**PS-7A-4-19** Mid-Infrared Imaging as a Label-Free Alternative to Immunohistochemistry for Breast Cancer PathologyM. J. WALSH<sup>1</sup>, A. KAJDACS-BALLA<sup>2</sup>, AND R. BHARGAVA<sup>1</sup><sup>1</sup>University of Illinois at Urbana-Champaign, Urbana, IL, <sup>2</sup>University of Illinois at Chicago, Chicago, IL**PS-7A-4-20** Confocal Microscope for Imaging Inflammation in the Mouse ColonM. A. SALDUA<sup>1</sup>, AND K. C. MAITLAND<sup>1</sup><sup>1</sup>Texas A&M University, College Station, TX**PS-7A-4-21** A Throughput-Optimized Detector for Multiple-Mouse Dynamic Contrast-Enhanced MRIM. S. RAMIREZ<sup>1</sup>, AND J. A. BANKSON<sup>1</sup><sup>1</sup>The University of Texas M. D. Anderson Cancer Center, Houston, TX**PS-7A-4-22** Multimodal Nanoparticles Targeting ICAM-1 in Tumor and Its Inflamed Milieu for Diagnosis and TherapyX. CHEN<sup>1</sup>, J. LEELAWATTANACHAI<sup>1</sup>, R. WONG<sup>1,2</sup>, A. WANG<sup>3</sup>, A. NIKITIN<sup>1</sup>, Y. WANG<sup>1,2</sup>, AND M. JIN<sup>1</sup><sup>1</sup>Cornell University, Ithaca, NY, <sup>2</sup>Weill Cornell Medical College, New York, NY, <sup>3</sup>Ocean Nanotech, Springdale, AR**PS-7A-4-23** A Comparison of Gold Nanoplates and Nanorods for Photoacoustic Image-Guided Photothermal TherapyG. P. LUKE<sup>1</sup>, K. HOMAN<sup>1</sup>, Y-S. CHEN<sup>1</sup>, W. FREY<sup>1</sup>, AND S. EMELIANOV<sup>1</sup><sup>1</sup>University of Texas at Austin, Austin, TX**PS-7A-4-24** Targeted Delivery of Gold Coated Iron Oxide Nanoclusters for Near Infrared Cancer Imaging and MRI Contrast EnhancementL. L. MA<sup>1</sup>, J. TAM<sup>1</sup>, A. BORWANKAR<sup>1</sup>, B. W. WILLSEY<sup>1</sup>, D. RIGDON<sup>1</sup>, K. SOKOLOV<sup>1,2</sup>, R. RAMESH<sup>2</sup>, AND K. P. JOHNSTON<sup>1</sup><sup>1</sup>University of Texas at Austin, Austin, TX, <sup>2</sup>M.D. Anderson Cancer Center, Houston, TX**PS-7A-4-25** Depth Discrimination and Quantitative Oximetry in Spectrally-resolved Optical MammographyY. YU<sup>1</sup>, A. SASSAROLI<sup>1</sup>, M. J. HOMER<sup>2</sup>, R. A. GRAHAM<sup>2</sup>, AND S. FANTINI<sup>1</sup><sup>1</sup>Tufts University, Medford, MA, <sup>2</sup>Tufts Medical Center, Boston, MA**PS-7A-4-26** A New Hybrid Tomosynthesis Reconstruction Method for Breast Cancer ImagingM. A. BARRERA<sup>1</sup>, AND W. QIAN<sup>1</sup><sup>1</sup>University of Texas at El Paso, El Paso, TX**PS-7A-4-27** Beveled Multifiber Probes for Polarized Reflectance Spectroscopy in TissueR. KARNIK<sup>1</sup>, L. T. NIEMAN<sup>2</sup>, AND K. SOKOLOV<sup>1,2</sup><sup>1</sup>University of Texas at Austin, Austin, TX, <sup>2</sup>University of Texas M.D. Anderson Cancer Center, Houston, TX**PS-7A-4-28** Intraoperative Imaging for Cancer Resection - Requirements for Real Time ImagingG. M. THURBER<sup>1</sup>, J-L. FIGUEIREDO<sup>1</sup>, AND R. WEISSELEDER<sup>1</sup><sup>1</sup>Harvard Medical School/Mass General Hospital, Boston, MA**PS-7A-4-29** Electromagnetically Tracking System and Forceps for Transbronchial BiopsyL. GRUIONU<sup>1</sup>, G. GRUIONU<sup>2</sup>, AND J. CHOI<sup>3</sup><sup>1</sup>University of Craiova, Severin, MH, Romania, <sup>2</sup>Indiana University School of Medicine, Indianapolis, IN, <sup>3</sup>Catholic University of America, Washington, DC**PS-7A-4-30** Biodegradable Near-Infrared Plasmonic Nanoclusters for Biomedical ApplicationsJ. O. TAM<sup>1</sup>, J. M. TAM<sup>1</sup>, A. MURTHY<sup>1</sup>, D. INGRAM<sup>1</sup>, L. L. MA<sup>1</sup>, K. A. TRAVIS<sup>1</sup>, K. JOHNSTON<sup>1</sup>, AND K. V. SOKOLOV<sup>1</sup><sup>1</sup>University of Texas at Austin, Austin, TX**PS-7A-4-31** Uptake of Polymer Coated Silicon Nanocrystals in Cancer CellsP. PUVANAKRISHNAN<sup>1</sup>, M. BOSCH<sup>1</sup>, C. HESSEL<sup>1</sup>, M. RASCH<sup>1</sup>, B. A. KORGEL<sup>1</sup>, AND J. W. TUNNELL<sup>1</sup><sup>1</sup>The University of Texas at Austin, Austin, TX**PS-7A-4-32** Simultaneous Measurement of RBC Velocity, Flux, Hematocrit and Shear Rate in Vascular NetworksW. S. KAMOUN<sup>1</sup>, R. K. JAIN<sup>1</sup>, AND L. L. MUNN<sup>1</sup><sup>1</sup>MGH/HMS, Boston, MA**PS-7A-4-33** Effective Shape Feature Extraction Algorithms for Prostate Cancer Image AnalysisD. STOCKTON<sup>1</sup>, F. YUAN<sup>2</sup>, AND Y. FENG<sup>2</sup><sup>1</sup>UTSA/UTHSCSA, San Antonio, TX, <sup>2</sup>UTSA, San Antonio, TX**PS-7A-4-34** Computer Aided Diagnosis (CAD) of Squamous Cell Carcinoma (SCC) of Head and Neck (H&N)Y. SHARMA<sup>1</sup>, R. M. PARRY<sup>1</sup>, S. H. RAZA<sup>1</sup>, Q. CHAUDRY<sup>1</sup>, T. H. STOKES<sup>1</sup>, X. WANG<sup>2</sup>, S. MULLER<sup>2</sup>, G. Z. CHEN<sup>2</sup>, AND M. D. WANG<sup>1,2</sup><sup>1</sup>Georgia Institute of Technology, Atlanta, GA, <sup>2</sup>Emory University, Atlanta, GA

**PS-7A-4-35** Automated Renal Cell Carcinoma Subtype Classification using Cellular Features of Elliptical Models of Segmented Nuclear ClustersQ. CHAUDRY<sup>1</sup>, S. H. RAZA<sup>1</sup>, Y. SHARMA<sup>1</sup>, S. KOTHARI<sup>2</sup>, A. N. YOUNG<sup>4</sup>, AND M. D. WANG<sup>1</sup><sup>1</sup>Georgia Institute of Technology, Atlanta, GA, <sup>2</sup>Emory University, Atlanta, GA**PS-7A-4-36** Biodistribution and Reticuloendothelial System Uptake of ICG-loaded Nanocapsules in MiceB. BAHMANI<sup>1</sup>, B. JUNG<sup>1</sup>, S. GUPTA<sup>1</sup>, AND B. ANVARI<sup>1</sup><sup>1</sup>University of California, Riverside, CA**PS-7A-4-37** Development of Tumor-Targeted MRI Contrast Agent for ImagingL. CUI<sup>1</sup>, C. KARMONIK<sup>2</sup>, B. LORENZ<sup>1</sup>, AND M. BIKRAM<sup>1</sup><sup>1</sup>University of Houston, Houston, TX, <sup>2</sup>Methodist Hospital, Houston, TX**PS-7A-4-38** A Dual-modality Optical Probe for Improving Prostate Cancer DiagnosisV. SHARMA<sup>1</sup>, N. PATEL<sup>1</sup>, AND H. LIU<sup>1</sup><sup>1</sup>The University of Texas at Arlington, Arlington, TX**PS-7A-4-39** Analysis of Transit Time Tomography of Microwave Breast Imaging Data with CurveletsA. S. PAI<sup>1</sup>, V. S. POTUNURU<sup>1</sup>, AND W. QIAN<sup>1</sup><sup>1</sup>University of Texas at El Paso, El Paso, TX**Track: Biomedical Imaging and Optics – PS-7A-5****Imaging in Cardiovascular Medicine****PS-7A-5-40** Ex Vivo Imaging of Vulnerable Atherosclerotic Plaques Using MMP-9-Dependent Macrophage-Binding Iron Oxide NanoparticlesS. S. YU<sup>1,2</sup>, W. G. JEROME<sup>3</sup>, D. J. MARON<sup>4</sup>, J. H. DICKERSON II<sup>1,2</sup>, AND T. D. GIORGIO<sup>1,2</sup><sup>1</sup>Vanderbilt University, Nashville, TN, <sup>2</sup>Vanderbilt Institute of Nanoscale Science & Engineering, Nashville, TN, <sup>3</sup>Vanderbilt University Medical Center, Nashville, TN, <sup>4</sup>Vanderbilt Heart & Vascular Institute, Nashville, TN**PS-7A-5-41** Deep Tissue Optical Imaging of Decubitus UlcersR. MOZA<sup>1</sup>, J. M. DIMAIO<sup>1</sup>, AND J. MELENDEZ<sup>2</sup><sup>1</sup>UTSouthwestern Medical Center, Dallas, TX, <sup>2</sup>Spectral MD Inc., Lakeway, TX**PS-7A-5-42** Directional Interpolation of Fluid Velocity FieldsC. M. ZWART<sup>1</sup>, H. M. BABIKER<sup>1</sup>, AND D. H. FRAKES<sup>1</sup><sup>1</sup>Arizona State University, Tempe, AZ**PS-7A-5-43** A Novel Method to Quantify Late Gadolinium Enhancement in Cardiac MRI using Rician PDFsJ. H. JORDAN<sup>1</sup>, W. G. HUNDLEY<sup>2</sup>, AND C. A. HAMILTON<sup>1,2</sup><sup>1</sup>VT-WFU School of Biomedical Engineering and Sciences, Winston-Salem, NC, <sup>2</sup>Wake Forest University School of Medicine, Winston-Salem, NC**PS-7A-5-44** Automatic Measurement of CT Phantoms in Major Cardiovascular Population StudiesM. ZHENG<sup>1,2</sup>, AND Y. GE<sup>1,2</sup><sup>1</sup>Wake Forest University Health Sciences, Winston-Salem, NC, <sup>2</sup>VT-WFU School of Biomedical Engineering & Sciences, Winston-Salem, NC**PS-7A-5-45** Analysis of MSC Homing in a Myocardial Infarct Model with Cryo-Imaging and Monte Carlo ModelingK. E. SULLIVANT<sup>1</sup>, G. J. STEYER<sup>1</sup>, L. KANODIA<sup>1</sup>, D. ROY<sup>1</sup>, M. PENN<sup>2</sup>, AND D. L. WILSON<sup>1</sup><sup>1</sup>Case Western Reserve University, Cleveland, OH, <sup>2</sup>Cleveland Clinic, Cleveland, OH**PS-7A-5-46** Imaging Tools to Study the Lymphatic SystemT. J. AKL<sup>1</sup>, E. RAHBAR<sup>1</sup>, Z. V. NEPIYUSHCHIKH<sup>2</sup>, J. E. MOORE<sup>1</sup>, A. A. GASHEV<sup>2</sup>, D. C. ZAWIEJA<sup>2</sup>, AND G. L. COTÉ<sup>1</sup><sup>1</sup>Texas A&M University, College Station, TX, <sup>2</sup>Texas A&M Health Science Center, Temple, TX**PS-7A-5-47** Design of Molecular Imaging Agent for Atherosclerosis-Targeting to Activated MacrophagesA. L. DOIRON<sup>1</sup>, L. ANDERSEN<sup>1</sup>, A-L. AULANIER<sup>1</sup>, R. SHEPHERD<sup>1</sup>, K. D. RINKER<sup>1</sup>, AND R. FRAYNE<sup>1</sup><sup>1</sup>University of Calgary, Calgary, Alberta, Canada**PS-7A-5-48** Echocardiographic Characterization of the Postnatal Development of Elastin-Insufficient MiceV. LE<sup>1</sup>, AND J. WAGENSEIL<sup>1</sup><sup>1</sup>Saint Louis University, Saint Louis, MO**PS-7A-5-49** Depolarizing the Mitochondrial Network is Not Cardioprotective During Global IschemiaR. M. SMITH<sup>1</sup>, S. S. VELAMAKANNI<sup>1</sup>, AND E. G. TOLKACHEVA<sup>1</sup><sup>1</sup>University of Minnesota, Minneapolis, MN**PS-7A-5-50** Design and Build of Left Ventricular Motion Phantom for Cardiac MRIM. ERSOY<sup>1</sup>, M. KOTYS<sup>2</sup>, X. ZHOU<sup>3</sup>, AND R. M. SETSER<sup>1,3</sup><sup>1</sup>Cleveland State University, Cleveland, OH, <sup>2</sup>Philips Healthcare, Cleveland, OH, <sup>3</sup>Cleveland Clinic, Cleveland, OH**PS-7A-5-51** Automatic Cardiac & Respiratory Cycle Detection of Self-gated Cardiac Cine MRI Navigator ProjectionsD. N. MHEMBERE<sup>1,2</sup>, L. GUO<sup>1</sup>, J. A. DERYSHIRE<sup>3</sup>, E. R. MCVEIGH<sup>1</sup>, AND D. A. HERZKA<sup>1</sup><sup>1</sup>Johns Hopkins School of Medicine, Baltimore, MD, <sup>2</sup>Morgan State University, Baltimore, MD, <sup>3</sup>DIR, NHLBI, NIH, DHHS, Bethesda, MD**PS-7A-5-52** Biophysical Properties of Vascular Endothelial Cells Upon Drug-loaded Nanoparticle DeliveryY. WU<sup>1</sup>, G. D. MCEWEN<sup>1</sup>, S. KONA<sup>2</sup>, H. XU<sup>2</sup>, K. T. NGUYEN<sup>2</sup>, AND A. ZHOU<sup>1</sup><sup>1</sup>Utah State University, Logan, UT, <sup>2</sup>University of Texas at Arlington, Arlington, TX**PS-7A-5-53** Imaging the Endothelial Glycocalyx Response to Flow and Role in MechanotransductionE. E. EBONG<sup>1,2</sup>, D. C. SPRAY<sup>2</sup>, AND J. M. TARBELL<sup>1</sup><sup>1</sup>The City College of New York, New York, NY, <sup>2</sup>Albert Einstein College of Medicine, Bronx, NY**PS-7A-5-54** Predicting the Local Onset of Alternans in HeartA. R. CRAM<sup>1</sup>, H. RAO<sup>1</sup>, AND E. G. TOLKACHEVA<sup>1</sup><sup>1</sup>University of Minnesota, Minneapolis, MN**PS-7A-5-55** Multi Channel Phased Array Coils for Small Animal Cardiac ImagingC-W. CHANG<sup>1</sup>, K. FENG<sup>1</sup>, J. BOSSHARD<sup>1</sup>, K. L. MOODY<sup>1</sup>, S. M. WRIGHT<sup>1</sup>, AND M. P. MCDUGALL<sup>1</sup><sup>1</sup>Texas A&M University, College Station, TX**PS-7A-5-56** Trial of Carotid Intima-Media Thickness (IMT) in the Evaluation of Patients with Acute Chest PainL. A. MELNIKER<sup>1</sup>, AND D. J. ORBACH<sup>1</sup><sup>1</sup>NY Methodist Hospital, Brooklyn, NY**PS-7A-5-57** A Blood Pool Contrast Agent for Cardiovascular Computed Tomography ImagingK. B. GHAGHADA<sup>1</sup>, O. KRAVCHUK<sup>2</sup>, S. HAYNES<sup>2</sup>, A. HALAWESH<sup>2</sup>, A. DIVEKA<sup>2</sup>, E. VAN BEEK<sup>3</sup>, E. HOFFMAN<sup>2</sup>, AND A. ANNAPRAGADA<sup>1</sup><sup>1</sup>The University of Texas Health Science Center, Houston, TX, <sup>2</sup>The University of Iowa, Iowa City, IA, <sup>3</sup>The University of Edinburgh, Edinburgh, United Kingdom**PS-7A-5-58** High Speed Doppler Fourier Domain Optical Coherence TomographyR. WANG<sup>1</sup>, R. GOODWIN<sup>2</sup>, R. R. MARKWALD<sup>3</sup>, AND B. Z. GAO<sup>1</sup><sup>1</sup>Clemson Univ., Clemson, SC, <sup>2</sup>University of South Carolina, Columbia, SC, <sup>3</sup>Medical University of South Carolina, Charleston, SC

**Track: Cardiovascular Engineering – PS-7A-6****Cardiac Electrical Structure and Contraction****PS-7A-6-59** Cardiac Mechanoenergetic Changes Due to Plasma Viscosity During HemodilutionS. CHAPUNG<sup>1</sup>, AND P. CABRALES<sup>1</sup><sup>1</sup>University of California, San Diego, La Jolla, CA**PS-7A-6-60** Cardiac Systolic Function Recovery After Hemorrhage Determines Survivability During ShockS. CHAPUNG<sup>1</sup>, AND P. CABRALES<sup>1</sup><sup>1</sup>University of California, San Diego, La Jolla, CA**PS-7A-6-61** Micro-ECG to Monitor Susceptibility of Regenerated Zebrafish Heart to a Potassium Channel BlockerF. YU<sup>1</sup>, N. CHI<sup>2</sup>, AND T. K. HSIAI<sup>1</sup><sup>1</sup>University of Southern California, Los Angeles, CA, <sup>2</sup>University of California, San Diego, San Diego, CA**PS-7A-6-62** Pulsed Infrared (IR) Radiation Evoked Calcium Release in Neonatal Cardiac MyocytesG. M. DITTAMI<sup>1</sup>, S. M. RAJGURU<sup>2</sup>, R. A. LASHER<sup>1</sup>, R. W. HITCHCOCK<sup>1</sup>, S. S. DHARIA<sup>1</sup>, AND R. D. RABBITT<sup>1</sup><sup>1</sup>University of Utah, Salt Lake City, UT, <sup>2</sup>Northwestern University, Chicago, IL**PS-7A-6-63** The Effect of Substrate Stiffness on Cardiomyocyte Action Potential Decay TimeJ. D. MYERS<sup>1</sup>, AND J. G. JACOT<sup>1,2</sup><sup>1</sup>Rice University, Houston, TX, <sup>2</sup>Texas Children's Hospital, Houston, TX**PS-7A-6-64** Hysteresis of Transition between 1:1 and 2:2 Rhythms in Restitution-independent Activation in pigsL. JING<sup>1</sup>, AND A. PATWARDHAN<sup>1</sup><sup>1</sup>University of Kentucky, Lexington, KY**PS-7A-6-65** Single Probe, Fiber Optic System for Whole Heart Intracellular Calcium Transient MeasurementC. EVANS<sup>1</sup>, S. WOODRUFF<sup>2</sup>, B. CHORPENING<sup>2</sup>, J. HENSEL<sup>2</sup>, AND S. SHROFF<sup>1</sup><sup>1</sup>University of Pittsburgh, Pittsburgh, PA, <sup>2</sup>National Energy Technology Lab, Morgantown, WV**PS-7A-6-66** The FFT Estimates Epicardial Activation Rate in Pigs but Not Dogs in Late Ventricular FibrillationJ. HUANG<sup>1</sup>, D. J. DOSDALL<sup>1</sup>, L. LI<sup>1</sup>, AND R. E. IDEKER<sup>1</sup><sup>1</sup>University of Alabama at Birmingham, Birmingham, AL**PS-7A-6-67** Frequency Domain Analysis of Heart Rate Variability Using Interpolation and ResamplingN. NADVAR<sup>1</sup>, B. E. DUNNE<sup>1</sup>, J. HEISNER<sup>2</sup>, A. K. CAMARA<sup>2</sup>, D. F. STOWE<sup>2</sup>, AND S. S. RHODES<sup>1,2</sup><sup>1</sup>Grand Valley State University, Grand Rapids, MI, <sup>2</sup>Medical College of Wisconsin, Milwaukee, WI**PS-7A-6-68** Excitability and Stimulation Thresholds for Nanosecond Pulses in Fish HeartsS. KNISLEY<sup>1</sup>, H. R. PHADKE<sup>1</sup>, J. KOLB<sup>1</sup>, K. SCHOENBACH<sup>1</sup>, AND J. PRATT<sup>1</sup><sup>1</sup>Old Dominion University, Norfolk, VA**PS-7A-6-69** Noninvasively Pacing the Embryonic Heart with a Pulsed LaserM. W. JENKINS<sup>1</sup>, A. R. DUKE<sup>2</sup>, S. GU<sup>1</sup>, H. J. CHIEL<sup>1</sup>, H. FUJIOKA<sup>1</sup>, M. WATANABE<sup>1</sup>, E. D. JANSEN<sup>2</sup>, AND A. M. ROLLINS<sup>1</sup><sup>1</sup>Case Western Reserve University, Cleveland, OH, <sup>2</sup>Vanderbilt University, Nashville, TN**PS-7A-6-70** Electrophysiological Changes of Differentiating Bone Marrow Stem Cells Laser Patterned with CardiomyocytesZ. MA<sup>1</sup>, H. LIU<sup>1</sup>, X. J. YUN<sup>1</sup>, T. K. BORG<sup>2</sup>, R. R. MARKWALD<sup>2</sup>, AND Z. B. GAO<sup>1</sup><sup>1</sup>Clemson University, Clemson, SC, <sup>2</sup>Medical University of South Carolina, Charleston, SC**PS-7A-6-71** Effects of Micropatterned Obstacles on Propagation in the Cardiac MonolayerH. HIMEL IV<sup>1</sup>, AND N. BURSAC<sup>1</sup><sup>1</sup>Duke University, Durham, NC**Track: Cardiovascular Engineering – PS-7A-7****Cardiovascular Devices****PS-7A-7-72** Modulation of Diastolic Filling Using a Cardiac Support Device With a Diastolic Recoil ComponentS. BISWAS<sup>1</sup>, T. SNOWDEN<sup>1</sup>, AND J. CRISCIONE<sup>1</sup><sup>1</sup>Texas A&M University, College Station, TX**PS-7A-7-73** The Admittance Method for the Measurement of Left Ventricular Volume in Large AnimalsE. R. LARSON<sup>1</sup>, J. E. PORTERFIELD<sup>1</sup>, J. W. VALVANO<sup>1</sup>, M. D. FELDMAN<sup>2</sup>, AND J. A. PEARCE<sup>1</sup><sup>1</sup>The University of Texas at Austin, Austin, TX, <sup>2</sup>The University of Texas Health Science Center at San Antonio, San Antonio, TX**PS-7A-7-74** A Successful Design of Stent Suitable for Patient's ConditionD. YOSHINO<sup>1</sup>, M. SATO<sup>1,2</sup>, AND K. INOUE<sup>3</sup><sup>1</sup>Graduate School of Engineering, Tohoku University, Sendai, Japan, <sup>2</sup>Graduate School of Biomedical Engineering, Tohoku University, Sendai, Japan, <sup>3</sup>Emeritus professor of Tohoku University, Sendai, Japan**PS-7A-7-75** Design Considerations for a New Device for a Single-Stage Hybrid Aortic Arch Replacement ProcedureH. M. SHERIF<sup>1</sup><sup>1</sup>Cardiac Surgery, Newark, DE**PS-7A-7-76** Minimally Invasive Cardiac Support and Assist Therapy for the Treatment of Congestive Heart FailureM. R. MORENO<sup>1,2</sup>, AND J. C. CRISCIONE<sup>1,2</sup><sup>1</sup>Texas A&M University, College Station, TX, <sup>2</sup>Corlnnova Incorporated, College Station, TX**PS-7A-7-77** Left Ventricular Volume for Heart Failure Monitoring Using AdmittanceJ. E. PORTERFIELD<sup>1</sup>, E. R. LARSON<sup>1</sup>, J. T. JENKINS<sup>2,3</sup>, D. ESCOBEDO<sup>2,3</sup>, M. D. FELDMAN<sup>2,3</sup>, J. W. VALVANO<sup>1</sup>, AND J. A. PEARCE<sup>1</sup><sup>1</sup>The University of Texas at Austin, Austin, TX, <sup>2</sup>The University of Texas Health Science Center, San Antonio, TX, <sup>3</sup>South Texas Veterans Health Care System, San Antonio, TX**PS-7A-7-78** Frictional Load of Shape Memory Polymer Devices Delivered via CatheterW. HWANG<sup>1</sup>, T. S. WILSON<sup>2</sup>, AND D. J. MAITLAND<sup>1</sup><sup>1</sup>Texas A&M University, College Station, TX, <sup>2</sup>Lawrence Livermore National Laboratory, Livermore, CA**PS-7A-7-79** Finite Element Simulation of Pacemaker Lead Dislodgement in Left Marginal Vein: Potential Risk FactorsX. ZHAO<sup>1</sup>, M. BURGER<sup>2</sup>, Y. LIU<sup>1</sup>, AND G. S. KASSAB<sup>1</sup><sup>1</sup>Indiana University-Purdue University, Indianapolis, IN, <sup>2</sup>Livermore Software Technology Corporation, Livermore, CA**PS-7A-7-80** Assessment of Hemodynamic Parameters Using Esophageal Doppler MonitorP. THAKORE<sup>1</sup>, A. RITTER<sup>2</sup>, AND G. ATLAS<sup>3</sup><sup>1</sup>Stevens Institute of Technology, Jersey City, NJ, <sup>2</sup>Stevens Institute of Technology, Hoboken, NJ, <sup>3</sup>UMDNJ, Livingston, NJ**PS-7A-7-81** FEA Analysis of a Biodegradable Alginate StentH. ZEID<sup>1</sup>, AND M. MOBED MIREMADI<sup>2</sup><sup>1</sup>San Jose State University, Campbell, CA, <sup>2</sup>San Jose State University, San Jose, CA**PS-7A-7-82** In Vitro Fluid Dynamic Effects of a New Coil Design for Cerebral Aneurysm EmbolizationH. BABIKER<sup>1</sup>, F. GONZALEZ<sup>2</sup>, F. ALBUQUERQUE<sup>2</sup>, D. COLLINS<sup>1</sup>, A. ELVIKIS<sup>1</sup>, AND D. FRAKES<sup>1</sup><sup>1</sup>Arizona State University, Tempe, AZ, <sup>2</sup>St. Joseph's Hospital and Medical Center, Phoenix, AZ

**Track: Cardiovascular Engineering – PS-7A-8****Cardiovascular Fluid Mechanics****PS-7A-8-83** Flow Characterization of an Arterial Flow Bioreactor using Particle Image VelocimetryE. E. VOIGT<sup>1</sup>, C. F. BUCHANAN<sup>1</sup>, J. SCHMIEG<sup>1</sup>, M. N. RYLANDER<sup>1</sup>, AND P. P. VLACHOS<sup>1</sup>  
<sup>1</sup>Virginia Tech, Blacksburg, VA**PS-7A-8-84** Using Computational Fluid Dynamics Model to Predict Changes in Velocity properties in Stented Carotid ArteryV. B. SHETH<sup>1</sup>, AND A. B. RITTER<sup>1</sup>  
<sup>1</sup>Stevens Institute of Technology, Hoboken, NJ**PS-7A-8-85** Anatomical Analysis of Optiflo on Patient Specific GeometriesK. DESAI<sup>1</sup>, C. HAGGERTY<sup>1</sup>, D. ZELICOURT<sup>1</sup>, M. FOGEL<sup>2</sup>, K. KANTER<sup>3</sup>, AND A. YOGANATHAN<sup>1</sup>  
<sup>1</sup>Georgia Institute of Technology, Atlanta, GA, <sup>2</sup>Children's Hospital of Philadelphia, Philadelphia, PA, <sup>3</sup>Emory University, Atlanta, GA**PS-7A-8-86** Study of the Hemodynamics in Dialysis Access FistulaeP. M. MCGAH<sup>1</sup>, J. J. RILEY<sup>1</sup>, AND A. ALISEDA<sup>1</sup>  
<sup>1</sup>University of Washington, Seattle, WA**PS-7A-8-87** Calculation of Coronary Wall Shear Stress Using Angiographic 3-Dimensional Reconstruction and Doppler Derived Velocity Measurements: A Novel Streamlined Technique for Clinical Assessment of Coronary Plaque ProgressionL. H. TIMMINS<sup>1,2</sup>, J. SUO<sup>1,2</sup>, P. ESHTEHARDI<sup>3</sup>, S. S. DHAWAN<sup>3</sup>, A. R. KING<sup>1,2</sup>, M. C. MCDANIEL<sup>3</sup>, H. SAMADY<sup>3</sup>, AND D. P. GIDDENS<sup>1,2</sup>  
<sup>1</sup>Georgia Institute of Technology, Atlanta, GA, <sup>2</sup>Emory University, Atlanta, GA, <sup>3</sup>Emory University School of Medicine, Atlanta, GA**PS-7A-8-88** Comparison of Inlet Flow Profiles in Patient-Specific Computational Fluid DynamicsI. CAMPBELL<sup>1</sup>, J. RIES<sup>2</sup>, W. TAYLOR<sup>1,3</sup>, AND J. OSHINSKI<sup>1,3</sup>  
<sup>1</sup>Georgia Institute of Technology/Emory University, Atlanta, GA, <sup>2</sup>Georgia Institute of Technology, Atlanta, GA, <sup>3</sup>Emory University, Atlanta, GA**PS-7A-8-89** Flow Reduction in an Intracranial Aneurysm by Multiple Stent DeploymentM. IONESCU<sup>1</sup>, AND R. W. METCALFE<sup>1</sup>  
<sup>1</sup>University of Houston, Houston, TX**PS-7A-8-90** Hematocrit-Dependent Red Blood Cell Exclusion and Restriction Zones are Present at the Wall of ArteriolesO. YALCIN<sup>1</sup>, M. JIVANI<sup>1</sup>, M. INTAGLIETTA<sup>1</sup>, AND P. JOHNSON<sup>1</sup>  
<sup>1</sup>UC San Diego, La Jolla, CA**PS-7A-8-91** Quantitative Variation Of Blood Pressure Dynamics During Simulated Sleep ApneaR. M. ALEX<sup>1</sup>, D. E. WATENPAUGH<sup>2</sup>, R. ZHANG<sup>3</sup>, A. BASHABOYINA<sup>1</sup>, G. BHAVE<sup>1</sup>, M. AL-ABED<sup>1</sup>, S. IYER<sup>1</sup>, E. ALTUWAJRI<sup>1</sup>, AND K. BEHBEHANI<sup>1</sup>  
<sup>1</sup>University of Texas At Arlington, Arlington, TX, <sup>2</sup>Sleep Consultants, Inc., Fort Worth, TX, <sup>3</sup>Presbyterian Medical Center of Dallas Institute for Exercise and Environmental Medicine, Dallas, TX**PS-7A-8-92** Uncertainty Quantification and Robust Design of Hemodynamics in Bypass Graft SurgeriesS. SANKARAN<sup>1</sup>, AND A. MARSDEN<sup>2</sup>  
<sup>1</sup>University of California San Diego, San Diego, CA, <sup>2</sup>University of California San Diego, La Jolla, CA**PS-7A-8-93** Hemodynamics in a Patient Specific Stented ArteryM. IONESCU<sup>1</sup>, AND R. W. METCALFE<sup>1</sup>  
<sup>1</sup>University of Houston, Houston, TX**PS-7A-8-94** Measured Flow in Compliant AAA Models with Iliac BifurcationC. A. MEYER<sup>1</sup>, C. GUIVIER-CURIEN<sup>1</sup>, E. BERTRAND<sup>1</sup>, AND V. DEPLANO<sup>1</sup>  
<sup>1</sup>IRPHE UMR 6594 CNRS, Marseille, France**PS-7A-8-95** Large Eddy Simulations Of Blood Flow In A Patient-Specific Aneurysmatic Carotid Artery GeometryH. RADHAKRISHNAN<sup>1</sup>, D. GRIGORIADIS<sup>1</sup>, AND S. C. KASSINOS<sup>1</sup>  
<sup>1</sup>University of Cyprus, Nicosia, Nicosia, Cyprus**PS-7A-8-96** The Effect of Imaging Parameters and Geometry on the Ability of MRI to Quantify Turbulent FlowS. PIDAPARTHI<sup>1</sup>, N. LAKKADI<sup>1</sup>, R. SETSER<sup>2</sup>, S. FLAMM<sup>2</sup>, AND C. GEORGE<sup>1</sup>  
<sup>1</sup>Cleveland State University, Cleveland, OH, <sup>2</sup>Cleveland Clinic, Cleveland, OH**PS-7A-8-97** Using CFD to Model Effects of Aortic Compliance Changes Related to Treatments for Aortic CoarctationJ. S. COOGAN<sup>1</sup>, F. P. CHAN<sup>1</sup>, C. A. TAYLOR<sup>1</sup>, AND J. A. FEINSTEIN<sup>1</sup>  
<sup>1</sup>Stanford University, Stanford, CA**PS-7A-8-98** Longitudinal MRI-based CFD Analysis of Hemodynamics in a Porcine Model of Dialysis Graft StenosisR. J. CHRISTOPHERSON<sup>1</sup>, C. M. TERRY<sup>2</sup>, H. LI<sup>2</sup>, I. ZHUPLATOV<sup>2</sup>, A. K. CHEUNG<sup>2,3</sup>, AND Y-T. E. SHIU<sup>1,2</sup>  
<sup>1</sup>Department of Bioengineering, University of Utah, Salt Lake City, UT, <sup>2</sup>Department of Medicine, University of Utah, Salt Lake City, UT, <sup>3</sup>The VA Salt Lake City Health Care System, Salt Lake City, UT**PS-7A-8-99** A Global Reduced-order Distributed Model for Physiological Fluid DynamicsO. SAN<sup>1</sup>, AND A. E. STAPLES<sup>1</sup>  
<sup>1</sup>Virginia Polytechnic Institute and State University, Blacksburg, VA**PS-7A-8-100** Shear Stress Determination in an Orbiting Culture Dish Using CFD and Validation with PIVJ. M. THOMAS<sup>1</sup>, M. SHAKERI<sup>1</sup>, R. E. BERSON<sup>1</sup>, AND M. K. SHARP<sup>1</sup>  
<sup>1</sup>University of Louisville, Louisville, KY**PS-7A-8-101** Stent Deployment at Bifurcations with Plaque Structures: Effects on Fluid Shear Stress and Solid Wall StressH. Y. CHEN<sup>1</sup>, M. STUREK<sup>2</sup>, D. BHATT<sup>2</sup>, AND G. KASSAB<sup>4</sup>  
<sup>1</sup>Purdue University, West Lafayette, IN, <sup>2</sup>Indiana University, Indianapolis, IN, <sup>3</sup>Harvard Medical School, Boston, MA, <sup>4</sup>Indiana University Purdue University Indianapolis, Indianapolis, IN**Track: Cellular and Molecular Engineering – PS-7A-9****Cell Mechanics, Adhesion, and Motility****PS-7A-9-102** Geometrical Constraints on Thin Film Substrates Affecting Active Mechanosensing and Cell MorphologyS. C. HUNLEY<sup>1</sup>, S. MEHROTRA<sup>1</sup>, K. M. PAWELEC<sup>1</sup>, L. ZHANG<sup>1</sup>, C. CHAN<sup>1</sup>, AND S. BAEK<sup>1</sup>  
<sup>1</sup>Michigan State University, East Lansing, MI**PS-7A-9-103** Oligomeric Amyloid Beta Peptide on Sialic LewisX-selectin Bonding at Cerebral Endothelial SurfaceS. ASKAROVA<sup>1</sup>, AND J. C-M. LEE<sup>1</sup>  
<sup>1</sup>University of Missouri, Columbia, MO**PS-7A-9-104** Quantifying ECM Signaling in Tumor Invasion: Covalent Links Influence Cell DynamicsJ. SRIVASTAVA<sup>1</sup>, AND M. ZAMAN<sup>2</sup>  
<sup>1</sup>University of Texas at Austin, Austin, TX, <sup>2</sup>Boston University, Boston, MA**PS-7A-9-105** Lymphocyte Dynamics on Aligned Endothelial CellsK. SONG<sup>1</sup>, K. KWON<sup>2</sup>, J-C. CHOI<sup>3</sup>, K. SUH<sup>2</sup>, AND J. DOH<sup>3</sup>  
<sup>1</sup>POSTECH, Pohang, Gyeongbuk, Korea, Republic of, <sup>2</sup>Seoul National University, Seoul, Korea, Republic of, <sup>3</sup>POSTECH, Pohang, Korea, Republic of

**PS-7A-9-106 Human Fibroblasts Generate Ten Times More Power in Mixed Hepatocyte/Fibroblast Microtissues than in Pure Fibroblast Microtissues.**J. YOUSSEF<sup>1</sup>, AND J. R. MORGAN<sup>1</sup><sup>1</sup>Brown University, Providence, RI**PS-7A-9-107 Forward Ray Tracing for High-Throughput Cell Deformation Cytometry with Diode Bar Optical Stretchers**I. SRAJ<sup>1</sup>, D. W. MARR<sup>2</sup>, AND C. D. EGGLETON<sup>1</sup><sup>1</sup>UMBC, Baltimore, MD, <sup>2</sup>Colorado School of Mines, Golden, CO**PS-7A-9-108 Biomechanical Effects of Flow and Coculture Environment on Endothelial Progenitor Cells**L. CAO<sup>1</sup>, AND G. A. TRUSKEY<sup>1</sup><sup>1</sup>Duke University, Durham, NC**PS-7A-9-109 The Effect of Mechanoregulation on Myotube Alignment During Myogenesis**M. JUNKIN<sup>1</sup>, AND P. K. WONG<sup>1</sup><sup>1</sup>University of Arizona, Tucson, AZ**PS-7A-9-110 Assembly of Human Umbilical Vein Endothelial Cells on Compliant Hydrogels**R. SAUNDERS<sup>1</sup>, AND D. HAMMER<sup>1</sup><sup>1</sup>University of Pennsylvania, Philadelphia, PA**PS-7A-9-111 sPLA2-III Enhances sAPPalpha Secretion Through Alterations in Membrane Fluidity**X. YANG<sup>1</sup>, W. SHENG<sup>1</sup>, Y. HE<sup>1</sup>, J. CUI<sup>1</sup>, M. HAIDEKKE<sup>2</sup>, G. SUN<sup>1</sup>, AND J. LEE<sup>1</sup><sup>1</sup>University of Missouri, Columbia, MO, <sup>2</sup>University of Georgia, Athens, GA**PS-7A-9-112 Effects of Fatty Acid Unsaturation Numbers on Membrane Fluidity and APP pProcessing**X. YANG<sup>1</sup>, W. SHENG<sup>1</sup>, G. SUN<sup>1</sup>, AND J. LEE<sup>1</sup><sup>1</sup>University of Missouri, Columbia, MO**PS-7A-9-113 System-Level Analysis of Collective Cell Migration in Cancer**D. HARJANTO<sup>1</sup>, AND M. H. ZAMAN<sup>1</sup><sup>1</sup>Boston University, Boston, MA**PS-7A-9-114 Endothelial Sarcomere Fluctuations Arise from Actin Polymerization at Focal Adhesions**R. J. RUSSELL<sup>1</sup>, S. MANGROO<sup>1</sup>, S. NAKASONE<sup>1</sup>, R. DICKINSON<sup>1</sup>, AND T. LELE<sup>1</sup><sup>1</sup>University of Florida, Gainesville, FL**PS-7A-9-115 Computational Analysis of Tensile Stress Propagation During the Migration of a Cohesive Cell Sheet**R. E. ZIELINSKI<sup>1</sup>, C. MIHAI<sup>1,2</sup>, D. L. KNOELL<sup>1,2</sup>, AND S. N. GHADIALI<sup>1,2</sup><sup>1</sup>The Ohio State University, Columbus, OH, <sup>2</sup>Dorothy M. Davis Heart and Lung Research Institute, Columbus, OH**PS-7A-9-116 Directing Dendritic Cell Migration: Using Microfluidics to Uncover Chemotactic Hierarchies**B. G. RICART<sup>1</sup>, B. JOHN<sup>1</sup>, C. A. HUNTER<sup>1</sup>, AND D. A. HAMMER<sup>1</sup><sup>1</sup>University of Pennsylvania, Philadelphia, PA**PS-7A-9-117 Proteolytic Activity Disturbs the Responses of Endothelial Cells to Fluid Shear Stress**A. E. ALTSHULER<sup>1</sup>, S. CHIEN<sup>1</sup>, AND G. W. SCHMID-SCHONBEIN<sup>1</sup><sup>1</sup>University of California, San Diego, La Jolla, CA**PS-7A-9-118 Effects of EGF on the Migration of Prostate Cancer Cell Line PC3-ML**U. TATA<sup>1</sup>, S. M. N. RAO<sup>1</sup>, K. NGUYEN<sup>1</sup>, AND J.-C. CHIAO<sup>1</sup><sup>1</sup>University of Texas at Arlington, Arlington, TX**PS-7A-9-119 Motor-Clutch Motility Model for U251 Glioblastoma Migration**B. L. BANGASSER<sup>1</sup>, C. CHAN<sup>1</sup>, S. S. ROSENFELD<sup>2</sup>, AND D. J. ODDE<sup>1</sup><sup>1</sup>University of Minnesota, Minneapolis, MN, <sup>2</sup>Columbia University, New York, NY**PS-7A-9-120 The Pyrophosphate Transporter ANKH Is Necessary For Mechanotransduction In The MC3T3 Cell Line**K. L. LEE<sup>1</sup>, AND C. R. JACOBS<sup>1</sup><sup>1</sup>Columbia University, New York, NY**PS-7A-9-121 Biomimetic Gel Material to Modulate Branching Morphogenesis of Submandibular Gland**H. MIYAJIMA<sup>1</sup>, S. AN<sup>1</sup>, K. LEE<sup>2</sup>, T. SAKAI<sup>1</sup>, AND T. MATSUMOTO<sup>1</sup><sup>1</sup>Osaka University, Suita, Japan, <sup>2</sup>Hanyang University, Seoul, Korea, Republic of**PS-7A-9-122 Observation of Podosome Assembly and Disassembly in Real Time *in Vitro***N. KIM<sup>1</sup>, J. HUYNH<sup>1</sup>, AND C. A. REINHART-KING<sup>1</sup><sup>1</sup>Cornell University, Ithaca, NY**PS-7A-9-123 Dissecting the Active Gel Dynamics of the Microtubule Cytoskeleton in Living Epithelial Cells**B. D. HOFFMAN<sup>1</sup>, K. M. VAN CITTERS<sup>2</sup>, A. W. LAU<sup>3</sup>, AND J. C. CROCKER<sup>2</sup><sup>1</sup>University of Virginia, Charlottesville, VA, <sup>2</sup>University of Pennsylvania, Philadelphia, PA, <sup>3</sup>Florida Atlantic University, Boca Raton, FL**PS-7A-9-124 Microrheological Assessment of the Viscoelastic Properties of Cardiac Myocytes**J. MICHAELSON<sup>1</sup>, H. CHO<sup>2</sup>, P. SO<sup>2</sup>, S. WASSERMAN<sup>2</sup>, AND H. HUANG<sup>1</sup><sup>1</sup>Columbia University, New York, NY, <sup>2</sup>Massachusetts Institute of Technology, Boston, MA**PS-7A-9-125 Extracellular Matrix Binding Protein (Embp) and Its Role in Bacterial Adhesion to Catheter Materials**J. A. CALLIHAN<sup>1</sup>, K. MIKHOVA<sup>1</sup>, AND J. D. BRYERS<sup>1</sup><sup>1</sup>University of Washington, Seattle, WA**PS-7A-9-126 Effect of Cell and Microvillus Elasticity on Intermolecular Bond Rupture**V. K. GUPTA<sup>1</sup>, AND C. D. EGGLETON<sup>1</sup><sup>1</sup>University of Maryland at Baltimore County, Baltimore, MD**PS-7A-9-127 Force Scanning: A High Resolution Modulus Mapping Approach for Atomic Force Microscopy**E. M. DARLING<sup>1</sup><sup>1</sup>Brown University, Providence, RI**PS-7A-9-128 A Microfluidic Shear Reactor to Study Biofilm Formation and Development**W. M. WEAVER<sup>1</sup>, V. MILISAVLJEVIC<sup>2</sup>, AND D. DI CARLO<sup>1,3</sup><sup>1</sup>University of California, Los Angeles, Los Angeles, CA, <sup>2</sup>David Geffen School of Medicine, UCLA, Los Angeles, CA, <sup>3</sup>California NanoSystems Institute, Los Angeles, CA**PS-7A-9-129 Effect of Substrate Stiffness on U251 Glioblastoma Morphology and Motility**K. OPOKU<sup>1</sup>, C. CHAN<sup>1</sup>, E. TUZEL<sup>1</sup>, S. ROSENFELD<sup>2</sup>, AND D. ODDE<sup>1</sup><sup>1</sup>University of Minnesota, Minneapolis, MN, <sup>2</sup>Columbia University, New York, NY**PS-7A-9-130 Stokesian Fluid Stimulus Probe for Delivering Localized pN Level Forces to Cultured MLO-Y4 Cells**D. WU<sup>1,2</sup>, P. GANATOS<sup>1</sup>, D. C. SPRAY<sup>2</sup>, AND S. WEINBAUM<sup>1</sup><sup>1</sup>The City College of New York, New York, NY, <sup>2</sup>Albert Einstein College of Medicine, Bronx, NY**PS-7A-9-131 Osteocyte Characterization on Polydimethylsiloxane Substrates: Quantification of Communication**L. SIMMERMAN<sup>1</sup>, P. SETHU<sup>2</sup>, AND M. SAUNDERS<sup>1</sup><sup>1</sup>University of Kentucky, Lexington, KY, <sup>2</sup>University of Louisville, Louisville, KY**PS-7A-9-132 Osteocyte Characterization on Polydimethylsiloxane Substrates: Viability, Growth and Sclerostin**L. SIMMERMAN<sup>1</sup>, J. MARTIN<sup>1</sup>, P. SETHU<sup>2</sup>, AND M. SAUNDERS<sup>1</sup><sup>1</sup>University of Kentucky, Lexington, KY, <sup>2</sup>University of Louisville, Louisville, KY**PS-7A-9-133 *In Vitro* Focal Adhesion Complex Manipulation in Single Neurons: A Model for Traumatic Brain Injury**B. E. DABIRI<sup>1,2</sup>, L. KERSCHER<sup>1,2</sup>, C. FRANCK<sup>1,2</sup>, M. A. HEMPHILL<sup>1,2</sup>, J. A. GOSS<sup>1,2</sup>, P. W. ALFORD<sup>1,2</sup>, AND K. K. PARKER<sup>1,2</sup><sup>1</sup>Disease Biophysics Group, School of Engineering and Applied Sciences, Harvard University, Cambridge, MA, <sup>2</sup>Wyss Institute for Biologically Inspired Engineering, Harvard University, Boston, MA

**PS-7A-9-134** Analysis of Primary Cilia Deflection Under Laminar Fluid Flow with 3D Imaging and Advanced ModelingM. E. DOWNS<sup>1</sup>, D. HOOEY<sup>1</sup>, F. HERZOG<sup>2</sup>, AND C. R. JACOBS<sup>1</sup><sup>1</sup>Columbia University, New York, NY, <sup>2</sup>Ecole Polytechnique Fédérale de Lausanne, Lausanne, Vaud, Switzerland**PS-7A-9-135** Nanotopology Guided Migration of T Cells in 2D and 3DK. KWON<sup>1</sup>, W. JEONG<sup>2</sup>, J. CHOI<sup>2</sup>, K. SONG<sup>2</sup>, K-Y. SUH<sup>1</sup>, AND J. DOH<sup>2</sup><sup>1</sup>Seoul National University, Gwanak-gu, Seoul, Korea, Republic of, <sup>2</sup>Pohang University of Science and Technology, Pohang, Gyeongbuk, Korea, Republic of**PS-7A-9-136** The Importance of Protein N-Terminal Acetylation in Actin Cytoskeleton on Cellular FunctionA. ELÓSEGUI<sup>1</sup>, C. GÁZQUEZ<sup>2</sup>, A. OREGI<sup>1</sup>, A. GIL<sup>1</sup>, R. ALDABE<sup>2</sup>, AND E. DE JUAN-PARDO<sup>1</sup><sup>1</sup>CEIT and TECNUN (University of Navarra), San Sebastián, Guipuzcoa, Spain, <sup>2</sup>FIMA University of Navarra, Pamplona, Navarra, Spain**PS-7A-9-137** Molecular Clues to Aberrant Nuclear Structure in Human Aging and DiseaseA. KALINOWSKI<sup>1</sup>, S. SHENOY<sup>1</sup>, M. LOESCHE<sup>1</sup>, AND K. N. DAHL<sup>1</sup><sup>1</sup>Carnegie Mellon University, Pittsburgh, PA**PS-7A-9-138** Endothelial Cell Phenotyping Using Receptor Expression Changes in Microfluidic ChannelsD. VICKERS<sup>1</sup>, AND S. MURTHY<sup>1</sup><sup>1</sup>Northeastern University, Boston, MA**PS-7A-9-139** Impedance Analysis of Cellular Activities of Oral Cancer Cells and Normal Epithelial CellsL. YANG<sup>1</sup><sup>1</sup>North Carolina Central University, Durham, NC**PS-7A-9-140** Interaction of Dendritic Cells with Different Matrices and VEGF BiologyL. SPRAGUE<sup>1</sup>, E. MELES<sup>1</sup>, A. VENKATESH<sup>1</sup>, M. PATE<sup>1</sup>, AND F. BENENCIA<sup>1,2</sup><sup>1</sup>Ohio University, Athens, OH, <sup>2</sup>Russ College of Engineering, Ohio University, Athens, OH**PS-7A-9-141** Cancer Stem Cells and Adhesion Molecules: New Insights for Breast Cancer MetastasisV. S. SHIRURE<sup>1</sup>, K. A. HENSON<sup>1</sup>, AND M. M. BURDICK<sup>1</sup><sup>1</sup>Ohio University, Athens, OH**PS-7A-9-142** Upregulation of Wnt5a Transcripts in Human Monocytes Treated with oxLDLP. M. BHATT<sup>1</sup>, C. J. LEWIS<sup>1</sup>, D. L. HOUSE<sup>1</sup>, D. J. GOETZ<sup>1</sup>, AND R. MALGOR<sup>1</sup><sup>1</sup>Ohio University, Athens, OH**PS-7A-9-143** *In Vitro* Elongation of Porcine Embryos Using Alginate Hydrogels as a Three-Dimensional Extracellular MatrixC. N. SARGUS<sup>1</sup>, S. A. PLAUTZ<sup>1</sup>, J. R. MILES<sup>2</sup>, J. VALLET<sup>2</sup>, AND A. K. PANNIER<sup>1</sup><sup>1</sup>University of Nebraska-Lincoln, Lincoln, NE, <sup>2</sup>USDA-ARS U.S. Meat Animal Research Center, Clay Center, NE**PS-7A-9-144** Parametric Analysis of Cyclic Strain Effects on Cell-cell AdhesionsJ. SIM<sup>1</sup>, C. SIMMONS<sup>1</sup>, P. BAECHTOLD<sup>1</sup>, N. BORGHI<sup>1</sup>, AND B. L. PRUITT<sup>1</sup><sup>1</sup>Stanford University, Stanford, CA**PS-7A-9-145** Massively Parallel, High Force Interrogation of Single Cell Mechanics via Localized Magnetic NanoparticlesP. TSENG<sup>1</sup>, J. JUDY<sup>1</sup>, AND D. DI CARLO<sup>1</sup><sup>1</sup>UCLA, Los Angeles, CA**PS-7A-9-146** Chemomechanical Mapping of Lutheran/B-CAM Interaction in Erythrocytes of Hemoglobin Genotype ASJ. L. MACIASZEK<sup>1</sup>, AND G. LYKOTRAFITIS<sup>1</sup><sup>1</sup>University of Connecticut, Storrs, CT**PS-7A-9-147** The Effect of Metallic Nanoparticles on Vascular Smooth Muscle Cell MechanicsW. MCALLISTER<sup>1</sup>, L. WILES<sup>1</sup>, J. TURBEVILLE<sup>1</sup>, P. KERSHER<sup>1</sup>, C. KITCHENS<sup>1</sup>, AND D. DEAN<sup>1</sup><sup>1</sup>Clemson University, Clemson, SC**PS-7A-9-148** Human a(1,3) Fucosyltransferases Regulating Selectin-Mediated Leukocyte AdhesionA. BUFFONE, JR.<sup>1</sup>, K. P. MCHUGH<sup>1</sup>, AND S. NEELAMEGHAM<sup>1</sup><sup>1</sup>State University of New York at Buffalo, Buffalo, NY**PS-7A-9-149** Guided Schwann Cell Motility on Cellular Scale Anisotropic TopographyJ. A. MITCHEL<sup>1</sup>, T. RAMCHAL<sup>1</sup>, AND D. HOFFMAN-KIM<sup>1</sup><sup>1</sup>Brown University, Providence, RI**PS-7A-9-150** Differential Roles of Stretch and Shortening on Cyclic Stretch-induced Stress Fiber AlignmentC-F. LEE<sup>1</sup>, H-J. HSU<sup>1</sup>, AND R. KAUNAS<sup>1</sup><sup>1</sup>Texas A&M University, College Station, TX**PS-7A-9-151** Incorporating Cellular Mechanical Heterogeneity in a Multicellular Mechanical ModelS. DEITCH<sup>1</sup>, AND D. DEAN<sup>1</sup><sup>1</sup>Clemson University, Clemson, SC**PS-7A-9-152** Digital Microfluidic Techniques for Single-Cell *In Vitro* Developmental Neurotoxicity ScreeningA. J. SWEENEY<sup>1</sup>, K. J. BURG<sup>1</sup>, T. K. BORG<sup>2</sup>, AND B. Z. GAO<sup>1</sup><sup>1</sup>Clemson University, Clemson, SC, <sup>2</sup>Medical University of South Carolina, Charleston, SC**PS-7A-9-153** A Biomimetic ECM Reveals Independent Effects of Adhesion and Stiffness on Cells in 3D GelsR. REEN<sup>1</sup>, A. L. SIEMINSKI<sup>2</sup>, M. D. STEVENSON<sup>1</sup>, M. BOEHM<sup>1</sup>, B. JODDAR<sup>1</sup>, K. W. KOELLING<sup>1</sup>, AND K. J. GOOCH<sup>1</sup><sup>1</sup>Ohio State University, Columbus, OH, <sup>2</sup>Franklin W. Olin College of Engineering, Needham, MA**PS-7A-9-154** Quantitative Comparison of Cellular Traction Forces and Cell Motility in 2D and 3D Hydrogel ScaffoldsH. LEE<sup>1</sup>, AND C. FRANCK<sup>1</sup><sup>1</sup>Brown University, Providence, RI**PS-7A-9-155** Myofibrillogenesis in Single Myocytes Cultured on Aligned-collagenH. LIU<sup>1</sup>, J. YUN<sup>1</sup>, T. BORG<sup>2</sup>, AND B. GAO<sup>1</sup><sup>1</sup>Clemson University, Clemson, SC, <sup>2</sup>Medical University of South Carolina, Charleston, SC**PS-7A-9-156** Microtubule Depolymerization Induces Traction Force Increase in Two Distinct PathwaysA. D. RAPE<sup>1</sup>, W. GUO<sup>1</sup>, AND Y-L. WANG<sup>1</sup><sup>1</sup>Carnegie Mellon University, Pittsburgh, PA**PS-7A-9-157** Integrin Mediated Injury in Neurons: A Role for Mechanotransduction in Mild Traumatic Brain InjuryM. A. HEMPHILL<sup>1,2</sup>, B. E. DABIRI<sup>1,2</sup>, J. A. GOSS<sup>1,2</sup>, P. W. ALFORD<sup>1,2</sup>, AND K. K. PARKER<sup>1,2</sup><sup>1</sup>Disease Biophysics Group, School of Engineering and Applied Sciences, Harvard University, Cambridge, MA, <sup>2</sup>Wyss Institute for Biologically Inspired Engineering, Harvard University, Boston, MA**PS-7A-9-158** Characterizing Multiple Biomolecular Interactions of Single Cells Using Bead Arrays on Elastic BeamsC. OUNKOMOL<sup>1</sup>, T. N. NGUYEN<sup>1</sup>, S. YAMADA<sup>1</sup>, AND V. HEINRICH<sup>1</sup><sup>1</sup>University of California, Davis, Davis, CA**PS-7A-9-159** Differential Talin and Vinculin Expression During Vascular Smooth Muscle Cell MechanotransductionO. V. SAZONOVA<sup>1</sup>, K. L. LEE<sup>1</sup>, J. Y. WONG<sup>1</sup>, AND M. A. NUGENT<sup>1,2</sup><sup>1</sup>Boston University, Boston, MA, <sup>2</sup>Boston University School of Medicine, Boston, MA

**PS-7A-9-160** Contribution of Vimentin Intermediate Filament to Cell Strength and MechanotransductionM. E. MURRAY<sup>1</sup>, AND P. A. JANMEY<sup>1</sup><sup>1</sup>University of Pennsylvania, Philadelphia, PA**PS-7A-9-161** Dynamic Stretching of Single Live Cells on an Elastomeric Micropost ArrayJ. MANN<sup>1</sup>, AND J. FU<sup>1</sup><sup>1</sup>University of Michigan, Ann Arbor, MI**PS-7A-9-162** Mechanically-Induced Remodeling of Fibroblast Cytoskeletal in 3D CulturesS-L. LEE<sup>1</sup>, K. PRYSE<sup>2</sup>, AND E. ELSON<sup>2</sup><sup>1</sup>Washington University, Saint Louis, MO, <sup>2</sup>Washington University School of Medicine, St. Louis, MO**PS-7A-9-163** Study Cancer Cell Migration Phenomenon Utilizing a Microfluidic Device Consisting Microgaps with Different Gap SizeZ. TONG<sup>1</sup>, M. DALLAS<sup>1</sup>, W-C. HUNG<sup>1</sup>, K. STEBE<sup>2</sup>, AND K. KONSTANTOPOULOS<sup>1</sup><sup>1</sup>Johns Hopkins University, Baltimore, MD, <sup>2</sup>University of Pennsylvania, Philadelphia, PA**PS-7A-9-164** Rigidity-dependent Costimulation of CD4+ T cellsE. JUDOKUSUMO<sup>1</sup>, E. TABDANOV<sup>1</sup>, AND L. C. KAM<sup>1</sup><sup>1</sup>Columbia University, New York, NY**PS-7A-9-165** The Cytoskeleton Modifies the Hyperosmotic Response of the Cell MembraneV. RAGOONANAN<sup>1</sup>, AND A. AKSAN<sup>1</sup><sup>1</sup>University of Minnesota, Minneapolis, MN**PS-7A-9-166** Characterization of Notch Ligand Endocytosis Using Laser TweezersE. BOTVINICK<sup>1</sup>, B. S. SHERGILL<sup>1</sup>, G. WEINMASTER<sup>2</sup>, L. MELOTY-KAPELLA<sup>2</sup> AND A. MUSSE<sup>2</sup><sup>1</sup>UC Irvine, Irvine, CA, <sup>2</sup>UC LA, Los Angeles, CA**PS-7A-9-167** Blocking Agent Effects on Motor Protein Motility in the *In Vitro* Motility AssayK. N. MILLER-JASTER<sup>1</sup>, AND W. GUILFORD<sup>1</sup><sup>1</sup>University of Virginia, Charlottesville, VA**PS-7A-9-168** Nanofibrous Engineered Surfaces for Study of Bacterial Adhesion and Biofilm FormationM. KARGAR<sup>1</sup>, J. WNAG<sup>1</sup>, A. S. NAIN<sup>1</sup>, AND B. BEHKAM<sup>1</sup><sup>1</sup>Virginia Tech, Blacksburg, VA**PS-7A-9-169** Transforming Growth Factor- $\alpha$  Enhances the Chemotactic Migration of Platelet-Derived Growth Factor Induced Anaplastic OligodendrogliomasR. A. ABLE<sup>1,2</sup>, C. NYABEO<sup>2</sup>, E. HOLLAND<sup>3</sup>, AND M. VAZQUEZ<sup>2</sup><sup>1</sup>The Graduate Center of CUNY, New York, NY, <sup>2</sup>City College of New York, New York, NY, <sup>3</sup>Memorial Sloan Kettering Cancer Center, New York, NY**PS-7A-9-170** The Role of Ligand Spacing on Platelet Adhesion to Fibrinogen Under Flow.A. G. VAN DE WALLE<sup>1</sup>, T. SPAIN<sup>1</sup>, AND D. W. SCHMIDTKE<sup>1</sup><sup>1</sup>University of Oklahoma, Norman, OK**PS-7A-9-171** Influence of Cell Deformation, Tether Formation and Catch/slip Bond Behavior on Leukocyte RollingD. B. KHISMATULLIN<sup>1</sup>, M. K. POSPIESZALSKA<sup>2</sup>, AND K. LEY<sup>2</sup><sup>1</sup>Tulane University, New Orleans, LA, <sup>2</sup>La Jolla Institute for Allergy & Immunology, La Jolla, CA**PS-7A-9-172** A Single-shot Microfluidic Device for Investigating the Effects of Shear Stress Magnitude and Spatial Gradients on Endothelial CellsH. MUDDANA<sup>1</sup>, D. AHMED<sup>1</sup>, T. J. HUANG<sup>1</sup>, AND P. J. BUTLER<sup>1</sup><sup>1</sup>Penn State University, University Park, PA**PS-7A-9-173** Evaluation of Elasticity Analyses of Non-Malignant and Malignant Breast Cells Using AFMM. NIKKHAH<sup>1</sup>, J. STROBL<sup>1</sup>, E. M. SCHMELZ<sup>1</sup>, AND M. AGAH<sup>1</sup><sup>1</sup>Virginia Tech, Blacksburg, VA**PS-7A-9-174** Strain and Ligand Dependent Activation of TGF-beta 1 by 3T3 FibroblastsM. K. SEWELL<sup>1</sup>, J. D. HUTCHESON<sup>1</sup>, AND W. D. MERRYMAN<sup>1</sup><sup>1</sup>Vanderbilt University, Nashville, TN**PS-7A-9-175** Regulation of Focal Adhesion Maturation and Cell Edge Dynamics by Epidermal Growth FactorI. SCHNEIDER<sup>1</sup>, AND Y. HOU<sup>1</sup><sup>1</sup>Iowa State University, Ames, IA**PS-7A-9-176** Mapping the Interactions among Arrayed Biomaterials, Adsorbed Proteins and Human Embryonic Stem CellsY. MEI<sup>1</sup>, S. GERECHT<sup>2</sup>, M. TAYLOR<sup>3</sup>, A. URQUHART<sup>4</sup>, S. R. BOGATYREV<sup>1</sup>, S-W. CHO<sup>1</sup>, M. C. DAVIES<sup>5</sup>, M. R. ALEXANDER<sup>5</sup>, R. LANGER<sup>1</sup>, AND D. ANDERSON<sup>1</sup><sup>1</sup>MIT, Cambridge, MA, <sup>2</sup>Johns Hopkins University, Baltimore, MD, <sup>3</sup>University of Central Lancashire, Lancashire, United Kingdom, <sup>4</sup>University of Strathclyde, Glasgow, United Kingdom, <sup>5</sup>The University of Nottingham, Nottingham, United Kingdom**Track: Devices: Nano to Micro – PS-7A-10****Biomems and Nanotech for Cellular Engineering****PS-7A-10-177** Sorting of Microtubules by Length Using Micro-grooves Fabricated on a ChipS. SUGITA<sup>1,2</sup>, T. MURASE<sup>1</sup>, N. SAKAMOTO<sup>1</sup>, T. OHASHI<sup>1,3</sup>, AND M. SATO<sup>1</sup><sup>1</sup>Tohoku University, Sendai, Japan, <sup>2</sup>Present: Nagoya Institute of Technology, Nagoya, Japan, <sup>3</sup>Present: Hokkaido University, Sapporo, Japan**PS-7A-10-178** A Microfabricated Insert for Precise Control Over the Oxygen Concentration within the Boyden ChamberS. C. OPPEGARD<sup>1</sup>, A. J. BLAKE<sup>1</sup>, J. C. WILLIAMS<sup>2</sup>, AND D. T. EDDINGTON<sup>1</sup><sup>1</sup>University of Illinois at Chicago, Chicago, IL, <sup>2</sup>University of Wisconsin - Madison, Madison, WI**PS-7A-10-179** A High-throughput Microfluidic Platform for Separating Particles by SizeG. WANG<sup>1</sup><sup>1</sup>Georgia Institute of Technology, Atlanta, GA**PS-7A-10-180** Addressable Micropatterning of Multiple Proteins and Cells with an Aqueous-processible PhotoresistJ-C. CHOI<sup>1</sup>, K. SONG<sup>1</sup>, M. KIM<sup>1</sup>, H-R. JUNG<sup>1</sup>, AND J. DOH<sup>1</sup><sup>1</sup>POSTECH, Pohang, Gyeongbuk, Korea, Republic of**PS-7A-10-181** High-Throughput Screening Platform for the Simultaneous Chemical Stimulation and Optical Imaging of Dissociated CellsA. K. AU<sup>1</sup>, W. C. WATT<sup>1</sup>, D. R. STORM<sup>1</sup>, AND A. FOLCH<sup>1</sup><sup>1</sup>University of Washington, Seattle, WA**PS-7A-10-182** Parallel Microfluidic Gradient Generator Array for Studying the Response of Individually Isolated Neurons to Biochemical GradientsN. BHATTACHARJEE<sup>1</sup>, AND A. FOLCH<sup>1</sup><sup>1</sup>University of Washington, Seattle, WA**PS-7A-10-183** Development of a Physiologically Relevant *In Vitro* Model of the Blood-Brain BarrierJ. D. WANG<sup>1</sup>, N. DOUVILLE<sup>1</sup>, S. TAKAYAMA<sup>1</sup>, AND M. E. EL-SAYED<sup>1</sup><sup>1</sup>University of Michigan, Ann Arbor, MI**PS-7A-10-184** Using an Organotypic Model for Simulating Axonal Strain During Traumatic Brain Injury EventsJ-P. DOLLE<sup>1</sup>, R. SCHLOSS<sup>1</sup>, AND M. L. YARMUSH<sup>1</sup><sup>1</sup>Rutgers University, Piscataway, NJ

**PS-7A-10-185** An Open-Surface Micro-Dispenser Valve for the Local Stimulation of Conventional Tissue CulturesC. G. SIP<sup>1</sup>, AND A. FOLCH<sup>1</sup><sup>1</sup>University of Washington, Seattle, WA**PS-7A-10-186** A Microfluidic Device Using a Permeation-Based Pump for Bacterial Cell Entrapment, Alignment and GrowthD. KIM<sup>1</sup>, P. CULLEN<sup>2</sup>, P. WIGGINS<sup>2</sup>, AND S. FRADEN<sup>1</sup><sup>1</sup>Brandeis University, Waltham, MA, <sup>2</sup>MIT, Cambridge, MA**PS-7A-10-187** A Mechanical Device for Long-Duration Immobilization and Microscopy of Cells and Small OrganismsL. JIANG<sup>1</sup>, J. B. ROBERTSON<sup>1</sup>, AND C. JANETOPOULOS<sup>1</sup><sup>1</sup>Vanderbilt University, Nashville, TN**Track: Devices: Nano to Micro – PS-7A-11****Drug Delivery Technologies: Nano to Micro Devices****PS-7A-11-188** Biocompatibility and Enhanced MRI Contrast Efficiency of Multistage NanovectorB. GODIN<sup>1</sup>, J. ANANTA<sup>2</sup>, R. SETHI<sup>3</sup>, S. FERRATI<sup>1</sup>, R. E. SERDA<sup>1</sup>, X. LIU<sup>1</sup>, R. KRISHNAMURTHY<sup>3</sup>, R. MUTHUPILLAI<sup>3</sup>, M. FERRARI<sup>1,4</sup>, L. J. WILSON<sup>2</sup>, AND P. DECUZZI<sup>1</sup><sup>1</sup>The University of Texas Health Science Center- Houston, Houston, TX, <sup>2</sup>Rice University, Houston, TX, <sup>3</sup>St. Luke's Episcopal Hospital, Houston, TX, <sup>4</sup>MD Anderson Cancer Center, Houston, TX**PS-7A-11-189** Colon Cancer Stem Cell Microarrays for Screening Signaling Pathway InhibitorsM. R. CARSTENS<sup>1</sup>, A. ACHARYA<sup>1</sup>, E. HUANG<sup>1</sup>, AND B. G. KESELOWSKY<sup>1</sup><sup>1</sup>University of Florida, Gainesville, FL**PS-7A-11-190** Stabilization of Trivalent Inactivated Polio Vaccine for Microneedle VaccinationW. C. EDENS<sup>1</sup>, N. DYBDAHL-SISSOKO<sup>2</sup>, M. A. PALLANSCH<sup>2</sup>, S. OBERSTE<sup>2</sup>, AND M. R. PRAUSNITZ<sup>1</sup><sup>1</sup>Georgia Institute of Technology, Atlanta, GA, <sup>2</sup>Centers for Disease Control and Prevention, Atlanta, GA**PS-7A-11-191** Synthesis of Size-tunable Protein-gold Nanoparticle AggregatesA. ALBANESE<sup>1</sup>, AND W. C. CHAN<sup>1</sup><sup>1</sup>University of Toronto, Toronto, Ontario, Canada**PS-7A-11-192** Decreasing Biofilm Formation Through the Use of Magnetic NanoparticlesE. N. TAYLOR<sup>1</sup>, AND T. J. WEBSTER<sup>1</sup><sup>1</sup>Brown University, Providence, RI**PS-7A-11-193** CANCELED**PS-7A-11-194** Cavitation Forces in Cell Suspension: Application to Drug DeliveryJ. LAUTZ<sup>1</sup>, G. SANKIN<sup>1</sup>, F. YUAN<sup>1</sup>, AND P. ZHONG<sup>1</sup><sup>1</sup>Duke University, Durham, NC**PS-7A-11-195** High Transition Temperature Hyperbranched and Dendritic pNIPAAm Synthesis for Targeted Drug DeliveryK. CHANG<sup>1</sup>, L. A. BERGMAN<sup>1</sup>, AND L. J. TAITE<sup>1</sup><sup>1</sup>Georgia Institute of Technology, Atlanta, GA**PS-7A-11-196** Daily Liquid Antiretroviral Pouch for PMTCT in Resource-Constrained SettingsC. GAMACHE<sup>1</sup>, AND R. MALKIN<sup>1</sup><sup>1</sup>Duke University, Durham, NC**PS-7A-11-197** Characterization of Nanoimprinted Shape-specific, Disease-responsive Drug CarriersM. E. CALDORERA-MOORE<sup>1</sup>, M. KANG<sup>1</sup>, V. SINGH<sup>1</sup>, Z. MOORE<sup>1</sup>, R. AGARWAL<sup>1</sup>, P. JURNEY<sup>1</sup>, R. HUANG<sup>1</sup>, S. SREENIVASAN<sup>1</sup>, L. SHI<sup>1</sup>, AND K. ROY<sup>1</sup><sup>1</sup>University of Texas at Austin, Austin, TX**PS-7A-11-198** Thermally-responsive Polymer-nanoshells Composites for Controlled Drug DeliveryL. STRONG<sup>1</sup>, S. SERSHEN<sup>1</sup>, AND J. WEST<sup>1</sup><sup>1</sup>Rice University, Houston, TX**PS-7A-11-199** Polyvinyl Alcohol-coated Nanoparticles are Extensively Trapped in Fresh Human Mucus *Ex Vivo*M. YANG<sup>1</sup>, S. K. LAI<sup>1</sup>, Y-Y. WANG<sup>1</sup>, C. HAPPE<sup>1</sup>, C. SO<sup>1</sup>, M. ZHANG<sup>1</sup>, AND J. S. HANES<sup>1</sup><sup>1</sup>The Johns Hopkins University, Baltimore, MD**PS-7A-11-200** A Study of Drug Release from Homogeneous PLGA MicrostructuresK. S. HANSEN<sup>1</sup><sup>1</sup>Purdue University, West Lafayette, IN**PS-7A-11-201** Biodegradable Nanoparticles Decorated with Folate as a Targeted Anticancer TherapeuticA. J. DITTO<sup>1</sup>, N. K. ROBBISHAW<sup>1</sup>, M. J. PANZNER<sup>1</sup>, W. J. YOUNGS<sup>1</sup>, AND Y. H. YUN<sup>1</sup><sup>1</sup>University of Akron, Akron, OH**PS-7A-11-202** Novel Photovoltaic Device-Based Drug Delivery System for Targeted Cancer ChemotherapyS. AMBURE<sup>1</sup>, D. TERREROS<sup>2</sup>, AND T. XU<sup>1,2</sup><sup>1</sup>University of Texas at El Paso, El Paso, TX, <sup>2</sup>Texas Tech University Health Sciences Center, El Paso, TX**PS-7A-11-203** Kinetic Swelling Responses of Iron Oxide/Hydrogel NanocompositesB. V. SLAUGHTER<sup>1</sup><sup>1</sup>The University of Texas at Austin, Austin, TX**PS-7A-11-204** Fabrication of PEGylated Double-Walled Nanospheres By Solvent EvaporationD. Y. CHO<sup>1</sup>, L. D. PATEL<sup>1</sup>, AND E. MATHIOWITZ<sup>1</sup><sup>1</sup>Brown University, Providence, RI**PS-7A-11-205** Size Effects of Polymer-nanoparticles Systems in Magnetic HyperthermiaO. T. MEFFORD<sup>1</sup>, S. L. SAVILLE<sup>1</sup>, B. QI<sup>1</sup>, AND R. WADHWA<sup>1</sup><sup>1</sup>Clemson University, Clemson, SC**Track: Neural Engineering – PS-7A-12****Brain-Computer Interfaces****PS-7A-12-206** Desflurane Anesthesia Reduces Extracellular Spike Transmission Probabilities in Rat Visual CortexJ. A. VIZUETE<sup>1</sup>, S. PILLAY<sup>2</sup>, B. J. MCCALLUM<sup>2</sup>, K. M. ROPELLA<sup>1</sup>, AND A. G. HUDETZ<sup>2</sup><sup>1</sup>Marquette University, Milwaukee, WI, <sup>2</sup>Medical College of Wisconsin, Milwaukee, WI**PS-7A-12-207** An Implantable Intracortical Neural Recording Microsystem with All-Optical Means for Both Transcutaneous Telemetry and Power DeliveryS. PARK<sup>1</sup>, Y-K. SONG<sup>2</sup>, D. A. BORTON<sup>1</sup>, W. R. PATTERSON<sup>1</sup>, M. YIN<sup>1</sup>, J. ACEROS<sup>1</sup>, AND A. V. NURMIKKO<sup>1</sup><sup>1</sup>Brown University, Providence, RI, <sup>2</sup>Seoul National University, Suwon-si, Gyeonggi-do, Korea, Republic of**PS-7A-12-208** An Integrated Low-power and Low-noise Preamplifier for a High-density Neural Recording InterfaceJ. KIM<sup>1</sup>, AND H. C. KIM<sup>1</sup><sup>1</sup>UC Santa Cruz, Santa Cruz, CA



**PS-7A-12-209** Evaluation of a Neural Spike Sorting Package Implemented in MATLABN. B. LANGHALS<sup>1</sup>, K. A. LUDWIG<sup>1</sup>, AND D. R. KIPKE<sup>1</sup><sup>1</sup>University of Michigan, Ann Arbor, MI**PS-7A-12-210** Development of a Custom Artificial Intelligence Model for Functional Upper Extremity Neuroprosthetic ControlD. E. NATHAN<sup>1</sup>, AND D. C. JEUTTER<sup>1</sup><sup>1</sup>Marquette University, Milwaukee, WI**Track: Neural Engineering – PS-7A-13****Circuit Models of The Nervous System: Chips that Learn****PS-7A-13-211** Validation of Granger Causality Using Unidirectional Neuronal NetworksS. ALAGAPAN<sup>1</sup>, L. PAN<sup>1</sup>, B. WHEELER<sup>1</sup>, AND T. DEMARSE<sup>1</sup><sup>1</sup>University of Florida, Gainesville, FL**Track: New Frontiers in Bioengineering – PS-7A-14****Biological Engineering in Cancer****PS-7A-14-212** Real Time Detection of Malignant Breast Mammary Epithelial Cells Using Ultrasonic Spectral AnalysisT. E. DOYLE<sup>1</sup>, H. PATEL<sup>1</sup>, J. B. GOODRICH<sup>1</sup>, S. KWON<sup>1</sup>, AND B. J. AMBROSE<sup>1</sup><sup>1</sup>Utah State University, Logan, UT**PS-7A-14-213** The Effect of a Three Dimensional Environment on Stress Protein Expression and Thermal Cell Death Kinetics *In Vitro*A. S. SONG<sup>1</sup>, AND K. R. DILLER<sup>1</sup><sup>1</sup>The University of Texas at Austin, Austin, TX**PS-7A-14-214** *In Vitro* Models for High-throughput Molecular Analysis of Stromal-epithelial Interactions in CancerS. HOLTON<sup>1</sup>, M. WALSH<sup>1</sup>, AND R. BHARGAVA<sup>1</sup><sup>1</sup>University of Illinois, Urbana, IL**PS-7A-14-215** Directing the Angiogenic Shift in Cancer Cells *In Vitro* Using a Tissue Engineering ApproachC. S. SZOT<sup>1</sup>, C. F. BUCHANAN<sup>1</sup>, M. N. RYLANDER<sup>1</sup>, AND J. W. FREEMAN<sup>1</sup><sup>1</sup>Virginia Polytechnic Institute and State University, Blacksburg, VA**PS-7A-14-216** Gold Nanoparticles With Chitosan Coatings for Laser Ablation of Hepatocellular Carcinoma CellsG. ZHANG<sup>1</sup>, AND A. M. GOBIN<sup>1</sup><sup>1</sup>University of Louisville, Louisville, KY**PS-7A-14-217** Regulation of Growth Factor-Dependent Tumor Cell Proliferation by Extracellular Matrix MechanicsT. A. ULRICH<sup>1,2</sup>, V. UMESH<sup>1</sup>, AND S. KUMAR<sup>1,2</sup><sup>1</sup>University of California, Berkeley, Berkeley, CA, <sup>2</sup>UCSF/UC Berkeley Joint Graduate Group in Bioengineering, Berkeley, CA**PS-7A-14-218** Comparative Evaluation of Transitional Cell Carcinoma TreatmentsX. ZHANG<sup>1</sup>, AND W. T. GODBEY<sup>1</sup><sup>1</sup>Tulane University, New Orleans, LA**PS-7A-14-219** Evaluation of CTC Transfection with Ab-Conjugated Nanoliposomes Under Microvascular Flow ConditionsR. HAROUAKA<sup>1</sup>, C-Y. CHUNG<sup>2</sup>, G. ROBERTSON<sup>2,3</sup>, AND S. ZHENG<sup>1,2</sup><sup>1</sup>The Pennsylvania State University, University Park, PA, <sup>2</sup>The Pennsylvania State University Cancer Institute, Hershey, PA, <sup>3</sup>The Pennsylvania State University College of Medicine, Hershey, PA**PS-7A-14-220** Role of  $\beta$ -catenin Gene Expression in Colon Cancer Cell Adhesion and GrowthS. AGASTIN<sup>1</sup>, AND M. KING<sup>1</sup><sup>1</sup>Cornell University, Ithaca, NY**PS-7A-14-221** Nitric Oxide Synthases Regulate Mouse Collecting Lymphatic Vessel ContractionS. LIAO<sup>1</sup>, G. CHENG<sup>1</sup>, L. L. MUNN<sup>1</sup>, D. FUKUMURA<sup>1</sup>, R. K. JAIN<sup>1</sup>, AND T. P. PADERA<sup>1</sup><sup>1</sup>Massachusetts General Hospital, Boston, MA**PS-7A-14-222** The Thermal Dose Concept and Quantitative Predictions of Thermal DamageJ. A. PEARCE<sup>1</sup><sup>1</sup>The University of Texas at Austin, Austin, TX**PS-7A-14-223** Protease-Activated Quantum Dot Probes to Assess Invasiveness of Cancer CellsN. J. ROHANI<sup>1</sup>, H. ZHU<sup>1</sup>, R. A. DREZEK<sup>1</sup>, V. L. COLVIN<sup>1</sup>, AND J. L. WEST<sup>1</sup><sup>1</sup>Rice University, Houston, TX**PS-7A-14-224** Naturally Derived Ivy Nanoparticles as an Alternative to Metal-based Nanoparticles for UV Protection in Cancer PreventionL. XIA<sup>1</sup>, S. LENAGHAN<sup>1</sup>, M. ZHANG<sup>1</sup>, Z. ZHANG<sup>1</sup>, AND Q. LI<sup>1</sup><sup>1</sup>University of Tennessee, Knoxville, TN**PS-7A-14-225** Divergent Roles for CD44 and Carcinoembryonic Antigen in Colon Carcinoma MetastasisM. DALLAS<sup>1</sup>, G. LIU<sup>2</sup>, S. THOMAS<sup>3</sup>, D. HUSO<sup>2</sup>, AND K. KONSTANTOPOULOS<sup>1</sup><sup>1</sup>Johns Hopkins University, Baltimore, MD, <sup>2</sup>Johns Hopkins Medical Institutions, Baltimore, MD, <sup>3</sup>École Polytechnique Fédérale de Lausanne, Lausanne, Switzerland**PS-7A-14-226** Poly(ethylene glycol) Based Hydrogels for Isolation of Metastatic Cues in a Cancer Metastasis ModelJ. E. SAIK<sup>1</sup>, B. J. GILL<sup>2,3</sup>, D. L. GIBBONS<sup>4</sup>, J. M. KURIE<sup>4</sup>, AND J. L. WEST<sup>2</sup><sup>1</sup>Rice University, Houston, TX, <sup>2</sup>Rice University, Houston, TX, <sup>3</sup>Baylor College of Medicine, Houston, TX, <sup>4</sup>MD Anderson Cancer Center, Houston, TX**PS-7A-14-227** Engineering 3D Microscale Niches for Studies of Oxygen-Dependent Tumor AngiogenesisS. S. VERBRIDGE<sup>1</sup>, N. CHOI<sup>1</sup>, Y. ZHENG<sup>1</sup>, D. BROOKS<sup>1</sup>, R. WILLIAMS<sup>1</sup>, A. STROOCK<sup>1</sup>, AND C. FISCHBACH<sup>1</sup><sup>1</sup>Cornell University, Ithaca, NY**PS-7A-14-228** Treatment Planning of Irreversible Electroporation for Intracranial DisordersP. A. GARCIA<sup>1</sup>, J. H. ROSSMEISL, JR.<sup>2</sup>, AND R. V. DAVALOS<sup>1</sup><sup>1</sup>Virginia Tech - Wake Forest, Blacksburg, VA, <sup>2</sup>Virginia Tech, Blacksburg, VA**PS-7A-14-229** Engineering Non-immunogenic Second Generation L-Asparaginase for Acute Lymphoblastic Leukemia TherapyJ. CANTOR<sup>1</sup>, T. YOO<sup>1</sup>, E. STONE<sup>1</sup>, AND G. GEORGIU<sup>1</sup><sup>1</sup>University of Texas at Austin, Austin, TX**PS-7A-14-230** Using an Adaptive-predictive Model of Colorectal Cancer Development to Design Patient-specific Colonoscopy Follow-up IntervalsE. A. SHERER<sup>1</sup>, S. AMBEDKAR<sup>2</sup>, S. PERNG<sup>2</sup>, Y. YIH<sup>2</sup>, AND T. F. IMPERIALE<sup>1,3</sup><sup>1</sup>Roudebush VAMC, Indianapolis, IN, <sup>2</sup>Purdue University, West Lafayette, IN, <sup>3</sup>Indiana University School of Medicine, Indianapolis, IN**PS-7A-14-231** Physical and Thermal Properties of Functionalized Fe-Pt Magnetic Nanoparticles Used for Intracellular Cancer TreatmentA. T. SHANK<sup>1</sup>, G. KOZLOWSKI<sup>1</sup>, I. E. PAVEL<sup>1</sup>, D. P. WOOLEY<sup>1</sup>, A. O. SHEETS<sup>1</sup>, K. WEAVER<sup>1</sup>, AND A. M. BERENQUER<sup>2</sup><sup>1</sup>Wright State University, Dayton, OH, <sup>2</sup>University of Alicante, Alicante, Alicante, Spain

**Track: Orthopedic and Rehabilitation Engineering - PS-7A-15****Musculoskeletal Cell Mechanotransduction****PS-7A-15-232** In Vitro Study of Confined and Unconfined Compression on Nucleus Pulposus CellsP. WANG<sup>1,2</sup>, L. YANG<sup>2</sup>, AND A. H. HSIEH<sup>1,3</sup><sup>1</sup>University of Maryland, College Park, MD, <sup>2</sup>Chongqing University, Chongqing, Chongqing, China, People's Republic of, <sup>3</sup>University of Maryland, Baltimore, MD**Track: Orthopedic and Rehabilitation Engineering - PS-7A-16****Orthopaedic Applications of Noninvasive Assessment and Imaging****PS-7A-16-233** Method for Noninvasive Assessment of Joint Motion over Long DurationsM. QADRI<sup>1</sup>, E. BERNSTEIN<sup>1</sup>, AND D. PETERSON<sup>1</sup><sup>1</sup>University of Connecticut Health Center, Farmington, CT**PS-7A-16-234** Intra-articular Delivery of an Interleukin-1 Antagonist Partly Reverses Altered Effects of Rat Knee InstabilityK. D. ALLEN<sup>1</sup>, S. B. ADAMS<sup>1</sup>, B. A. MATA<sup>1</sup>, M. GABR<sup>1</sup>, P. Y. HWANG<sup>1</sup>, AND L. A. SETTON<sup>1</sup><sup>1</sup>Duke University, Durham, NC**PS-7A-16-235** Cortical and Compact Bone Models From Clinical CT: Methods for Cortical Thickness ReconstructionD. P. MORENO<sup>1,2</sup>, D. L. CROUCH<sup>1,2</sup>, F. S. GAYZIK<sup>1,2</sup>, AND J. D. STITZEL<sup>1,2</sup><sup>1</sup>Wake Forest University School of Medicine, Winston-Salem, NC, <sup>2</sup>Virginia Tech - Wake Forest University Center for Injury Biomechanics, Winston-Salem, NC**PS-7A-16-236** The Influence of Tortuosity in Bone Ultrasonic Wave PropagationM. F. SOUZANCHI<sup>1</sup>, L. CARDOSO<sup>1</sup>, AND S. C. COWIN<sup>1</sup><sup>1</sup>City College of The City University of New York, New York, NY**Track: Respiratory Engineering - PS-7A-17****Acute Lung Injury from Cell to System****PS-7A-17-237** Protective Effects of Surfactant During Pulsatile Flow in a Biomimetic AirwayH. W. GLINDMEYER IV<sup>1</sup>, AND D. P. GAVER III<sup>1</sup><sup>1</sup>Tulane University, New Orleans, LA**PS-7A-17-238** Inhibitory Effects of Albumin on Dynamic Surface Tension Characteristics of Pulmonary SurfactantB. D. FOWLER<sup>1</sup>, E. YAMAGUCHI<sup>1</sup>, AND D. P. GAVER<sup>1</sup><sup>1</sup>Tulane University, New Orleans, LA**PS-7A-17-239** Alveolar Inflation Mechanics Following Elastase DegradationC. E. PERLMAN<sup>1</sup><sup>1</sup>Stevens Institute of Technology, Hoboken, NJ**PS-7A-17-240** Quantitative Histology of Contused Lung Tissue with Comparison to Computed TomographyF. S. GAYZIK<sup>1,2</sup>, J. J. HOTH<sup>1</sup>, AND J. D. STITZEL<sup>1,2</sup><sup>1</sup>Wake Forest University School of Medicine, Winston-Salem, NC, <sup>2</sup>Virginia Tech - Wake Forest Center for Injury Biomechanics, Winston-Salem, NC**PS-7A-17-241** Two Distinct Mechanisms of Polymer-enhanced Lung Surfactant Adsorption for ARDSI. C. SHIEH<sup>1</sup>, AND J. A. ZASADZINSKI<sup>1</sup><sup>1</sup>University of California, Santa Barbara, CA**PS-7A-17-242** The Correlation Between Rib Fractures and Pulmonary ContusionsB. FRY<sup>1</sup>, E. S. KIM<sup>2</sup>, W. FRY<sup>1</sup>, AND H. C. GABLER<sup>2</sup><sup>1</sup>Carilion Clinic, Roanoke, VA, <sup>2</sup>Virginia Tech, Blacksburg, VA**Track: Respiratory Engineering – PS-7A-18****Microfluidics and Tissue Engineering Constructs for the Lung****PS-7A-18-243** Micro-flow Visualization to Evaluate Effects of Lung Surfactant Surrounding a Semi-infinite BubbleE. YAMAGUCHI<sup>1</sup>, B. J. SMITH<sup>1</sup>, B. D. FOWLER<sup>1</sup>, AND D. P. GAVER<sup>1</sup><sup>1</sup>Tulane University, New Orleans, LA**PS-7A-18-244** Design of a Device for Mechanical Stimulation of Tissue-Engineered ConstructsJ. IMSIROVIC<sup>1</sup>, K. VO<sup>1</sup>, K. DERRICKS<sup>2</sup>, C. RICH<sup>2</sup>, M. NUGENT<sup>1,2</sup>, AND B. SUKI<sup>1</sup><sup>1</sup>Boston University, Boston, MA, <sup>2</sup>Boston University School of Medicine, Boston, MA**Track: Systems Biology, Bioinformatics and Computational Biology – PS-7A-19****Molecular and Cellular Design and Evolution****PS-7A-19-245** Computational Analysis of Lignin Biosynthesis in Transgenic Alfalfa: From Steady-State to DynamicsY. LEE<sup>1</sup>, AND E. O. VOIT<sup>1</sup><sup>1</sup>Georgia Institute of Technology, Atlanta, GA**PS-7A-19-246** In Vitro Evolution of Streptavidin in the Presence of an Unnatural Amino AcidA. SINGH<sup>1</sup><sup>1</sup>University of Texas at Austin, Austin, TX**Track: Systems Biology, Bioinformatics and Computational Biology – PS-7A-20****Systems Neuroscience****PS-7A-20-247** Implementation of an EMG-Based Measure of Rigidity in a PD Symptom Quantification SystemS. ASKARI<sup>1</sup>, AND D. WON<sup>1</sup><sup>1</sup>California State University Los Angeles, Los Angeles, CA**PS-7A-20-248** MOVED TO PS-8B-16-202 (Friday afternoon)**PS-7A-20-249** Epileptic Seizure Detection System for Neural Implantable DeviceH. C. KIM<sup>1</sup>, AND J. S. KIM<sup>1</sup><sup>1</sup>University of California Santa Cruz, Santa Cruz, CA**PS-7A-20-250** A Synaptic Model of Dopamine Dynamics in Parkinson's Disease, Schizophrenia, and AddictionZ. QI<sup>1,2</sup>, G. W. MILLER<sup>2</sup>, AND E. O. VOIT<sup>1,2</sup><sup>1</sup>GIT, Atlanta, GA, <sup>2</sup>Emory, Atlanta, GA

**PS-7A-20-251** Ankle Stiffness Control During Quiet Standing versus Active Sensory Feedback Control with DelayA. MAHBOOBIN<sup>1</sup>, M. CENCIARINI<sup>1</sup>, M. REDFERN<sup>1</sup>, AND P. LOUGHLIN<sup>1</sup>  
<sup>1</sup>University of Pittsburgh, Pittsburgh, PA**PS-7A-20-252** Computational Study of RF Effect of Mobile Phones and Its Biological Effect on Brain CancerS. GOGINENI<sup>1</sup>, A. NORDQUIST<sup>1</sup>, AND Y. FENG<sup>1</sup>  
<sup>1</sup>University of Texas at San Antonio, San Antonio, TX**PS-7A-20-253** The Role of Cholesterol in Alzheimer's disease Pathogenesis: Preliminary ReportC. KYRTSOS<sup>1</sup>, AND J. S. BARAS<sup>1</sup>  
<sup>1</sup>University of Maryland, College Park, MD**PS-7A-20-254** Effects of a HIFU-Simulated Blast Pulse Train on a Simple Neural ModelR. ABDUL WAHAB<sup>1,2</sup>, M. CHOI<sup>2</sup>, V. ZDERIC<sup>2</sup>, AND M. R. MYERS<sup>3</sup>  
<sup>1</sup>US FDA, Silver Spring, MD, <sup>2</sup>George Washington University, Washington, DC, <sup>3</sup>US FDA, Silver Spring, MD**Track:Tissue Engineering – PS-7A-21****Cell Delivery and Cell-Based Therapeutics****PS-7A-21-255** Pathogen Mimetics to Better Understand the Kinetics of Phagocytosis in Non-phagocytic Cell TypesC. BLANCHETTE<sup>1</sup>, P. PACHECO<sup>2</sup>, Y. WOO<sup>3</sup>, N. SHEN<sup>1</sup>, A. HIDDESEN<sup>1</sup>, AND T. SULCHEK<sup>2</sup>  
<sup>1</sup>Lawrence Livermore National Lab, Livermore, CA, <sup>2</sup>Georgia Tech, Atlanta, GA, <sup>3</sup>Lawrence Berkeley National Lab, Berkeley, CA**PS-7A-21-256** Ultra-Rapid Purification of Type I Collagen for Bioengineering ApplicationsC. A. PACAK<sup>1</sup>, J. M. POWERS<sup>1</sup>, AND D. B. COWAN<sup>1</sup>  
<sup>1</sup>Children's Hospital Boston and Harvard Medical School, Boston, MA**PS-7A-21-257** Detecting Hypoxia in Encapsulated Cells: Characterization of a Fluorescent Hypoxia Detection SystemM. L. SKILES<sup>1</sup>, J. BLANCHETTE<sup>1</sup>, R. FANCY<sup>1</sup>, AND N. WILDER<sup>1</sup>  
<sup>1</sup>University of South Carolina, Columbia, SC**PS-7A-21-258** Differentiation of Mouse Embryonic Stem Cells into Neuron-like or Schwann Cell-like Cells for Functional Repair of the Inner EarP. RAMAMURTHY<sup>1</sup>, T. ROTH<sup>1</sup>, F. EBISU<sup>1</sup>, AND K. BARALD<sup>1</sup>  
<sup>1</sup>University of Michigan, Ann Arbor, MI**PS-7A-21-259** I3C NMR and Isotopomeric Analysis for Metabolic Studies of Cryopreserved Pancreatic SubstitutesH. AHMAD<sup>1,2</sup>, A. LAWSON<sup>1,2</sup>, N. SIMPSON<sup>3</sup>, AND A. SAMBANIS<sup>1,2</sup>  
<sup>1</sup>Georgia Institute of Technology, Atlanta, GA, <sup>2</sup>Georgia Tech/Emory Center for the Engineering of Living Tissues, Atlanta, GA, <sup>3</sup>University of Florida, Gainesville, FL**PS-7A-21-260** The Use of Perfluorocarbons to Noninvasively Monitor the Microenvironment of Engineered TissuesF. GOH<sup>1,2</sup>, R. LONG<sup>2,3</sup>, N. SIMPSON<sup>4</sup>, AND A. SAMBANIS<sup>1,2</sup>  
<sup>1</sup>Georgia Institute of Technology, Atlanta, GA, <sup>2</sup>Georgia Tech-Emory Center for the Engineering of Living Tissues, Atlanta, GA, <sup>3</sup>Emory University School of Medicine, Atlanta, GA, <sup>4</sup>University of Florida, Gainesville, FL**PS-7A-21-261** Effect of Endothelial Cell and Osteoblast Co-culture Ratios on Angiogenesis and MineralizationA. R. SHAH<sup>1,2</sup>, J. C. WENKE<sup>2</sup>, AND C. M. AGRAWAL<sup>1</sup>  
<sup>1</sup>University of Texas at San Antonio, San Antonio, TX, <sup>2</sup>US Army Institute of Surgical Research, San Antonio, TX**PS-7A-21-262** CANCELED**PS-7A-21-263** Restoration of Skeletal Muscle Defects Using Dedifferentiated Fibroblasts and Fibrin MicrothreadsC. MALCUIT<sup>1,2</sup>, G. PINS<sup>1</sup>, T. DOMINKO<sup>1</sup>, AND R. PAGE<sup>1,2</sup>  
<sup>1</sup>Worcester Polytechnic Institute, Worcester, MA, <sup>2</sup>Cellthera, Inc, Southbridge, MA**PS-7A-21-264** Derivation of Cardiac Progenitors from Induced Pluripotent Stem Cells for Cardiac Tissue EngineeringS. CHAKRABORTY<sup>1</sup>, N. CHRISTOFOROU<sup>1</sup>, AND K. LEONG<sup>1</sup>  
<sup>1</sup>Duke University, Durham, NC**Track:Tissue Engineering – PS-7A-22****Engineered Models of Tissue Disease****PS-7A-22-265** Tissue Engineering a Three-Dimensional Model of Osteoporosis with PTH and GIPR. S. HAYDEN<sup>1</sup>, AND D. L. KAPLAN<sup>1</sup>  
<sup>1</sup>Tufts University, Medford, MA**PS-7A-22-266** FE Modeling of MREM. HAGHPANAHI<sup>1</sup>  
<sup>1</sup>Iran University of Science and Technology, Tehran, Tehran, Iran**PS-7A-22-267** Modifications in the Pericellular Matrix Assembly of Chondrocytes Deficient in Collagen Type VIM. BARON<sup>1</sup>, K. D. ALLEN<sup>1</sup>, P. BONALDO<sup>2</sup>, F. GUILAK<sup>1</sup>, AND L. A. SETTON<sup>1</sup>  
<sup>1</sup>Duke University, Durham, NC, <sup>2</sup>Universita degli Studi di Padova, Padova, Padova, Italy**PS-7A-22-268** Investigating Glioblastoma Behavior in 3D Culture Using Hydrogel BiomaterialsS. S. RAO<sup>1</sup>, S. BENTIL<sup>1</sup>, J. DEJESUS<sup>1</sup>, J. LARISON<sup>1</sup>, R. DUPAIX<sup>1</sup>, A. SARKAR<sup>1</sup>, AND J. O. WINTER<sup>1</sup>  
<sup>1</sup>The Ohio State University, Columbus, OH**PS-7A-22-269** Modeling of Brain White Matter under Blast LoadingA. SUNDARAMURTHY<sup>1</sup>, AND N. CHANDRA<sup>1</sup>  
<sup>1</sup>University of Nebraska Lincoln, Lincoln, NE**PS-7A-22-270** A Numerical and Experimental Study of Magnetic Fluid Hyperthermia Near a Blood Vessel with Pulsed Application of AC Magnetic FieldM. HAGHPANAHI<sup>1</sup>  
<sup>1</sup>Iran University of Science and Technology, Tehran, Tehran, Iran**PS-7A-22-271** Varying Assay Geometry to Emulate Connective Tissue Planes in an *In Vitro* Model of AcupunctureD. I. SHREIBER<sup>1</sup>, M. JULIAS<sup>1</sup>, AND H. M. BUETTNER<sup>1</sup>  
<sup>1</sup>Rutgers, the State University of New Jersey, Piscataway, NJ**PS-7A-22-272** CANCELED**PS-7A-22-273** Reverse of Myosin Isoform Conversion by Insulin Therapy in Engineered Heart Tissue.H. SONG<sup>1</sup>, P. ZANDSTRA<sup>1</sup>, AND M. RADISIC<sup>1</sup>  
<sup>1</sup>University of Toronto, Toronto, ON, Canada**PS-7A-22-274** Apoptosis Resistance of Multicellular Spheroids in Three-Dimensional Polymeric ScaffoldsJ. W. KIM<sup>1</sup>, W. J. HO<sup>1</sup>, AND B. WU<sup>1</sup>  
<sup>1</sup>University of California Los Angeles, Los Angeles, CA**PS-7A-22-275** Towards an *Ex Vivo* Model of Lesion Formation in EndometriosisN. DOYLE<sup>1,2</sup>, M. T. BESTE<sup>1,2</sup>, B. A. JOUGHIN<sup>1,3</sup>, D. A. LAUFFENBURGER<sup>1,2</sup>, K. B. ISAACSON<sup>2,4</sup>, AND L. G. GRIFFITH<sup>1,2</sup>  
<sup>1</sup>Department for Biological Engineering, MA Institute of Technology, Cambridge, MA, <sup>2</sup>Center for Gynecopathology Research, Massachusetts Institute of Technology, Cambridge, MA, <sup>3</sup>David H. Koch Institute for Integrative Cancer Research, Massachusetts Institute of Technology, Cambridge, MA, <sup>4</sup>Minimally Invasive Gynecologic Surgery Center, Newton-Wellesley Hospital, Newton, MA

**Track: Tissue Engineering – PS-7A-23****Skin and Adipose Tissue Engineering****PS-7A-23-276** Effects of the Cellular Microenvironment on Adipocyte MetabolismN. LAI<sup>1</sup>, AND K. LEE<sup>1</sup><sup>1</sup>Tufts University, Medford, MA**PS-7A-23-277** Effect of Dynamic Culture on 3D Co-Culture of Adipose Derived Stem Cells and Endothelial Cells on Silk Scaffolds for Sustained Soft Tissue RegenerationE. BELLAS<sup>1</sup>, B. PANILALITIS<sup>1</sup>, K. MARRA<sup>2</sup>, J. RUBIN<sup>2</sup>, J. J. YOO<sup>3</sup>, AND D. L. KAPLAN<sup>1</sup><sup>1</sup>Tufts University, Medford, MA, <sup>2</sup>University Of Pittsburgh, Pittsburgh, PA, <sup>3</sup>WFIRM, Winston-Salem, NC**PS-7A-23-278** Determination of Diffusion Coefficients in Calcium Alginate PhantomsZ. MONTGOMERY<sup>1</sup>, R. HOOD<sup>1</sup>, AND C. RYLANDER<sup>1</sup><sup>1</sup>Virginia Tech, Blacksburg, VA**PS-7A-23-279** Development of a Vascularized Dermal Equivalent using Adipose Derived Stem CellsS. NATESAN<sup>1</sup>, G. ZHANG<sup>2</sup>, T. J. WALTERS<sup>1</sup>, L. J. SUGGS<sup>3</sup>, AND R. J. CHRISTY<sup>1</sup><sup>1</sup>USASIR, Fort Sam Houston, TX, <sup>2</sup>University of Akron, Akron, OH, <sup>3</sup>University of Texas at Austin, Austin, TX**PS-7A-23-280** Epidermal Differentiation Governs Engineered Skin BiomechanicsG. C. EBERSOLE<sup>1</sup>, P. M. ANDERSON<sup>1</sup>, AND H. M. POWELL<sup>1</sup><sup>1</sup>Ohio State University, Columbus, OH**Track: Tissue Engineering – PS-7A-24****Tissue Engineered Models for Drug Discovery****PS-7A-24-281** A Tissue Scale, *In Vitro*, Combination Contractility and Electrophysiological AssayA. GROSBERG<sup>1,2</sup>, M. D. BRIGHAM<sup>1,2</sup>, AND K. K. PARKER<sup>1,2</sup><sup>1</sup>Disease Biophysics Group, School of Engineering and Applied Sciences, Harvard University, Cambridge, MA, <sup>2</sup>Wyss Institute for Biologically Inspired Engineering, Harvard University, Boston, MA**PS-7A-24-282** Use of a Thermoresponsive Polymer to Fabricate Uniform Tumor ModelsJ. A. REED<sup>1</sup>, J. P. FREYER<sup>1</sup>, AND H. E. CANAVAN<sup>1</sup><sup>1</sup>University of New Mexico, Albuquerque, NM**PS-7A-24-283** 3D *In Vitro* Liver Tissue Model System: HEPG2 Liver cells in 3D Alginate HydrogelsS-F. LAN<sup>1</sup>, AND B. STARLY<sup>2</sup><sup>1</sup>University of Oklahoma, Norman, OK, <sup>2</sup>University of Oklahoma, Norman, OK**Track: Translational Biomedical Engineering – PS-7A-25****Islet Generation/Transplantation: A Translational Perspective****PS-7A-25-284** Promoting Islet Engraftment using Locally Released S1P Pharmacological ModulatorsD. T. BOWERS<sup>1</sup>, S. TANNER<sup>1</sup>, P. CHHABRA<sup>2</sup>, K. L. BRAYMAN<sup>2</sup>, AND E. A. BOTCHWEY<sup>1</sup><sup>1</sup>University of Virginia, Charlottesville, VA, <sup>2</sup>University of Virginia, Charlottesville, VA**PS-7A-25-285** Evaluation of Macroporous Silicone Scaffolds for Islet Transplantation within an Alternative SiteE. PEDRAZA<sup>1</sup>, A-C. BRADY<sup>1</sup>, A. PILEGGI<sup>1</sup>, AND C. L. STABLER<sup>1</sup><sup>1</sup>University of Miami, Miami, FL**PS-7A-25-286** A Red Blood Cell Aggregometer Using an Air-Pressure Driven Disaggregation MethodJ. PARK<sup>1</sup>, Y. KANG<sup>1</sup>, M. KIM<sup>1</sup>, AND S. YANG<sup>1</sup><sup>1</sup>GIST, Gwangju, Jeonla, Korea, Republic of**PS-7A-25-287** Improvement of Hematocrit Measurement Accuracy in a Microfluidic Impedance SystemM. SON<sup>1</sup>, M. KIM<sup>1</sup>, AND S. YANG<sup>1</sup><sup>1</sup>GIST, Gwangju, Jeonnam, Korea, Republic of**PS-7A-25-288** Synergistic Interaction between Stress Waves and Cavitation in Stone Comminution during Shock Wave LithotripsyJ. LAUTZ<sup>1</sup>, S. REISS<sup>1</sup>, G. SANKIN<sup>1</sup>, W. N. SIMMONS<sup>1</sup>, AND P. ZHONG<sup>1</sup><sup>1</sup>Duke University, Durham, NC

**Track: Tissue Engineering \* – 7-1-1****Novel Biomaterials and Scaffolds – I**

**Chairs:** Adam Engler, Padma Rajagopalan  
Room 12A

**10:30AM OP-7-1-1A** Engineering Cell Adhesive PEG Hydrogels by Michael Addition and Photopolymerization

D. R. JONES<sup>1</sup>, J. ZHU<sup>1</sup>, AND R. E. MARCHANT<sup>1</sup>  
<sup>1</sup>Case Western Reserve University, Cleveland, OH

**10:45AM OP-7-1-1B** Radiation Crosslinked Polyurethane Shape Memory Polymers with Tunable Mechanical Properties for Biomedical Device Applications

K. HEARON<sup>1</sup>, T. S. WILSON<sup>2</sup>, AND D. J. MAITLAND<sup>1</sup>  
<sup>1</sup>Texas A&M University, College Station, TX, <sup>2</sup>Lawrence Livermore National Laboratory, Livermore, CA

**11:00AM OP-7-1-1C** New Biodegradable Fumerate and Maleate-Based Polymers for Bone Tissue Engineering

K. N. CICOTTE<sup>1,2</sup>, S. M. DIRK<sup>1</sup>, AND E. L. HEDBERG-DIRK<sup>2</sup>  
<sup>1</sup>Sandia National Laboratories, Albuquerque, NM, <sup>2</sup>University of New Mexico, Albuquerque, NM

**11:15AM OP-7-1-1D** Evaluation of the Osteointegration Potential of a Biphasic Scaffold for Tendon-Bone Healing

X. ZHANG<sup>1</sup>, K. L. MOFFAT<sup>1</sup>, X. S. LIU<sup>1</sup>, B. ZHOU<sup>1</sup>, X. GUO<sup>1</sup>, AND H. H. LU<sup>1</sup>  
<sup>1</sup>Columbia University, New York, NY

**11:30AM OP-7-1-1E** Dual Scaffolding System For The Engineering Of Muscle-Tendon Junctions

M. R. LADD<sup>1,2</sup>, S. LEE<sup>2</sup>, A. ATALA<sup>2</sup>, AND J. J. YOO<sup>1,2</sup>  
<sup>1</sup>Wake Forest/Virginia Tech, Winston Salem, NC, <sup>2</sup>Wake Forest Institute for Regenerative Medicine, Winston Salem, NC

**11:45AM OP-7-1-1F** Surface Functionalization of Hydrogels by Polyelectrolyte Multilayer Films for Tissue Engineering

S. YAMANLAR<sup>1,2</sup>, S. SANTI<sup>1,2</sup>, AND A. KHADEMHOSEINI<sup>1,2</sup>  
<sup>1</sup>Center for Biomedical Engineering, Brigham and Women's Hospital, Harvard Medical School, Cambridge, MA, <sup>2</sup>Harvard-MIT Division of Health Sciences and Technology, Massachusetts Institute of Technology, Cambridge, MA

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

**Track: Biomedical Imaging and Optics – 7-1-2****Molecular Imaging I – New Approaches and Technologies**

**Chairs:** Mark Borden, Jinyi Qi  
Room 12B

**10:30AM OP-7-1-2A** Imaging the Inflammation-Driven Neurodegeneration Associated with Alzheimer's Disease

E. ANDREOZZI<sup>1</sup>, AND A. LOUIE<sup>1</sup>  
<sup>1</sup>University of California, Davis, Davis, CA

**10:45AM OP-7-1-2B** Exploring the Benefit of Time-of-Flight PET

N. CAO<sup>1</sup>, R. H. HUESMAN<sup>2</sup>, W. W. MOSES<sup>2</sup>, AND J. QI<sup>1</sup>  
<sup>1</sup>University of California at Davis, Davis, CA, <sup>2</sup>Lawrence Berkeley National Lab, Berkeley, CA

**11:00AM OP-7-1-2C** Syntheses and T1 Relaxivity of Block Copolymers Based Gadolinium Encapsulated Nanoparticles

S. HOU<sup>1</sup>, S. TONG<sup>1</sup>, AND G. BAO<sup>1</sup>  
<sup>1</sup>Georgia Institute of Technology, Atlanta, GA

**11:15AM OP-7-1-2D** Lanthanide-doped SPIO Nanoparticles as a Non-Radiative, Multiplex Approach to Quantify Tumor Targeting

A. ELIAS<sup>1</sup>, AND A. TSOURKAS<sup>1</sup>  
<sup>1</sup>University of Pennsylvania, Philadelphia, PA

**11:30AM OP-7-1-2E** Ultrasound Molecular Imaging of  $\alpha_v\beta_3$  Integrin in Mouse Tumors

X. HU<sup>1</sup>, C. ANDERSON<sup>2</sup>, J. RYCHAK<sup>2</sup>, AND K. FERRARA<sup>1</sup>  
<sup>1</sup>University of California, Davis, Davis, CA, <sup>2</sup>Targeson, Inc, San Diego, CA

**11:45AM OP-7-1-2F** Bioorthogonal Chemistry Enhances Nanosensor Targeting to Cancer Cells

J. B. HAUN<sup>1</sup>, N. K. DEVARAJ<sup>1</sup>, H. LEE<sup>1</sup>, AND R. WEISSELEDER<sup>1</sup>  
<sup>1</sup>Massachusetts General Hospital, Boston, MA

**Track: Biomedical Imaging and Optics – 7-1-3****Imaging in Cancer Using Nanotechnology – I**

**Chairs:** Nichole Rylander, James Tunnell  
Room 19A

**10:30AM OP-7-1-3A** An Intein-mediated Click Conjugation Strategy for Improved Targeting of Nanoparticle Systems

A. ELIAS<sup>1</sup>, AND A. TSOURKAS<sup>1</sup>  
<sup>1</sup>University of Pennsylvania, Philadelphia, PA

**10:45AM OP-7-1-3B** Synthesis of a Hybrid Plasmonic-Superparamagnetic Contrast Agent for Magneto-Photo-Acoustic Imaging

R. L. TRUBY<sup>1</sup>, K. A. HOMAN<sup>1</sup>, M. QU<sup>1</sup>, M. MEHRMOHAMMADI<sup>1</sup>, AND S. EMELIANOV<sup>1</sup>  
<sup>1</sup>The University of Texas at Austin, Austin, TX

**11:00AM OP-7-1-3C** Imaging of Molecular Interactions Between Therapeutic Gold/Iron Nanoparticles and Lung Cancer Cells

J. O. TAM<sup>1</sup>, T. YOKOYAMA<sup>2</sup>, T. LARSON<sup>1</sup>, A. SCOTT<sup>2</sup>, S. KONDO<sup>2</sup>, J. A. ROTH<sup>2</sup>, R. RAMESH<sup>2</sup>, AND K. V. SOKOLOV<sup>1</sup>  
<sup>1</sup>University of Texas at Austin, Austin, TX, <sup>2</sup>MD Anderson Cancer Center, Houston, TX

**11:15AM OP-7-1-3D** Tumor Imaging With a Multifunctional Targeted-Reporter Complex via Reporter Enzyme Complementation

A-M. BROOME<sup>1</sup>, G. RAMAMURTHY<sup>1</sup>, K. LAVIK<sup>1</sup>, L. A. LIGGETT<sup>1</sup>, AND J. P. BASILION<sup>1</sup>  
<sup>1</sup>Case Western Reserve University, Cleveland, OH

**11:30AM OP-7-1-3E** Wide-Field Near-Infrared Narrow Band Imaging of Gold Nanoparticles' Distribution in Tumors

P. PUVANAKRISHNAN<sup>1</sup>, J. PARK<sup>1</sup>, P. DIAGARADJANE<sup>2</sup>, G. P. GOODRICH<sup>3</sup>, S. KRISHNAN<sup>2</sup>, AND J. W. TUNNELL<sup>1</sup>  
<sup>1</sup>The University of Texas at Austin, Austin, TX, <sup>2</sup>The University of Texas M.D Anderson Cancer Center, Houston, TX, <sup>3</sup>Nanospectra Biosciences Inc, Houston, TX

**11:45AM OP-7-1-3F** Gold Nanoshells as Potential Contrast Agents for Rapid Intraoperative Breast Cancer Detection

L. R. BICKFORD<sup>1</sup>, AND R. A. DREZEK<sup>1</sup>  
<sup>1</sup>Rice University, Houston, TX

**Track: Neural Engineering – 7-1-4****Brain-Computer Interfaces**

**Chairs:** Dan Moran, Patrick Wolf  
Room 19B

**10:30AM OP-7-1-4A** Spinal Cord Recordings from Descending Motor Tracts Using Multi-Wires for Command Signal Generation

A. PRASAD<sup>1</sup>, AND M. SAHIN<sup>1</sup>  
<sup>1</sup>New Jersey Institute of Technology, Newark, NJ

**10:45AM OP-7-1-4B** A Bidirectional Brain-Machine Interface with Motor Recordings and Sensory Microstimulation FeedbackJ. E. O'DOHERTY<sup>1</sup>, P. J. IFFT<sup>1</sup>, K. Z. ZHUANG<sup>1</sup>, M. A. LEBEDEV<sup>1</sup>, AND M. A. NICOLELIS<sup>1</sup>  
<sup>1</sup>Duke University, Durham, NC**11:00AM OP-7-1-4C** Decoding Functional Intention Using Near-infrared SpectroscopyT. CHAU<sup>1,2</sup>, S. POWER<sup>1</sup>, K. TAI<sup>2</sup>, S. LIDDLE<sup>3</sup>, AND T. FALK<sup>2</sup>  
<sup>1</sup>University of Toronto, Toronto, Ontario, Canada, <sup>2</sup>Bloorview Research Institute, Toronto, Ontario, Canada, <sup>3</sup>Massachusetts General Hospital, Boston, MA**11:15AM OP-7-1-4D** Toward Artificial Proprioception: Closing the Loop Through Cortical StimulationB. M. LONDON<sup>1</sup>, R. RUIZ TORRES<sup>1</sup>, AND L. E. MILLER<sup>1</sup>  
<sup>1</sup>Northwestern University, Chicago, IL**11:30AM OP-7-1-4E** Optimizing Intracortical Microstimulation Via Asymmetric PulsesA. KOIVUNIEMI<sup>1</sup>, AND K. OTTO<sup>2</sup>  
<sup>1</sup>Purdue University, Indianapolis, IN, <sup>2</sup>Purdue University, West Lafayette, IN**11:45AM OP-7-1-4F** A Model of the M1 Neuron During Movements of Fingers and the Wrist in Macaque MonkeysS. ACHARYA<sup>1</sup>, M. H. SCHIEBER<sup>2</sup>, AND N. V. THAKOR<sup>1</sup>  
<sup>1</sup>Johns Hopkins University, Baltimore, MD, <sup>2</sup>University of Rochester, Rochester, NY**Track: Cellular and Molecular Engineering – 7-1-5****Cellular and Subcellular Imaging****Chairs:** Kristen Carlson Maitland, Prabhas Moghe  
Room 18A**10:30AM OP-7-1-5A** Parsing Stem Cell Behaviors in Complex Microenvironments via High Content Imaging and ModelingE. LIU<sup>1</sup>, S. VEGA<sup>1</sup>, S. GORDONOV<sup>1</sup>, J. KIM<sup>1</sup>, AND P. V. MOGHE<sup>1</sup>  
<sup>1</sup>Rutgers University, Piscataway, NJ**10:45AM OP-7-1-5B** Anisotropically Patterned Cardiac Tissue Displays Mature Ca<sup>2+</sup> Handling *In Vitro*H. JIN<sup>1</sup>, H. LEE<sup>1</sup>, B. DABIRI<sup>1</sup>, A. W. FEINBERG<sup>1</sup>, AND K. K. PARKER<sup>1</sup>  
<sup>1</sup>Wyss Institute for Biologically Inspired Engineering, SEAS, Harvard University, Cambridge, MA**11:00AM OP-7-1-5C** In Situ Analyses of mRNA Splicing via DNA Logic GatesR. SCHWELLER<sup>1</sup>, AND M. DIEHL<sup>1</sup>  
<sup>1</sup>Rice University, Houston, TX**11:15AM OP-7-1-5D** Membrane Remodeling in the Footprint of Arrested Neutrophils Revealed Using DTIRF MicroscopyP. SUND<sup>1</sup>, E. GUTIERREZ<sup>2</sup>, A. GROISMAN<sup>2</sup>, AND K. LEY<sup>2,3</sup>  
<sup>1</sup>La Jolla Institute for Allergy and Immunology, La Jolla, CA, <sup>2</sup>University of California San Diego, La Jolla, CA, <sup>3</sup>La Jolla Institute for Allergy and Immunology, La Jolla, CA**11:30AM OP-7-1-5E** Digitizing Cell Lineage and Morphogenesis With Spectral Two-Photon MicroscopyH. C. GIBBS<sup>1</sup>, A. C. LEKVEN<sup>1</sup>, AND A. T. YEH<sup>1</sup>  
<sup>1</sup>Texas A&M University, College Station, TX**11:45AM OP-7-1-5F** CANCELED**Track: Cellular and Molecular Engineering – 7-1-6****Cell Adhesion – I****Chairs:** Julie Ji, Benjamin Keselowsky  
Room 18B**10:30AM OP-7-1-6A** CD11c/CD18 Expression is Upregulated on Blood Monocytes During Hypertriglyceridemia and Enhances Adhesion to VCAM-1R. M. GOWER<sup>1</sup>, H. WU<sup>2</sup>, C. M. BALLANTYNE<sup>2</sup>, A. A. KNOWLTON<sup>1</sup>, AND S. I. SIMON<sup>1</sup>  
<sup>1</sup>University of California Davis, Davis, CA, <sup>2</sup>Baylor College of Medicine, Houston, TX**10:45AM OP-7-1-6B** Mutating FimH of E. coli to Allosterically Affect Catch-bond Behavior as a Force-activated AdhesiveV. B. RODRIGUEZ<sup>1</sup>  
<sup>1</sup>University of Washington, Seattle, WA**11:00AM OP-7-1-6C** Membrane Cholesterol and Ethanol Together Differentially Regulate Neutrophil Tethering and RollingM. FURLOW<sup>1</sup>, AND S. DIAMOND<sup>1</sup>  
<sup>1</sup>University of Pennsylvania, Philadelphia, PA**11:15AM OP-7-1-6D** Neutrophil Shear-Induced Resistance to Activation via the Formyl Peptide ReceptorM. J. MITCHELL<sup>1</sup>, AND M. R. KING<sup>1</sup>  
<sup>1</sup>Cornell University, Ithaca, NY**11:30AM OP-7-1-6E** Determination Of Threshold Forces For Tether Formation In VesiclesD. J. STARK<sup>1</sup>, T. C. KILLIAN<sup>1</sup>, AND R. M. RAPHAEL<sup>1</sup>  
<sup>1</sup>Rice University, Houston, TX**11:45AM OP-7-1-6F** Characterization of Selectin-mediated Cell Binding Using the Micropatterning Technology and ModelingL. CHEUNG<sup>1</sup>, Z. TONG<sup>1</sup>, K. J. STEBE<sup>2</sup>, AND K. KONSTANTOPOULOS<sup>1</sup>  
<sup>1</sup>Johns Hopkins University, Baltimore, MD, <sup>2</sup>University of Pennsylvania, Philadelphia, PA**Track: Cardiovascular Engineering – 7-1-7****Innovations in Cardiovascular Bioengineering I: Cardiac****Chairs:** Nenad Bursac, Jeff Holmes  
Room 18C**10:30AM OP-7-1-7A** Morphomechanics of Embryonic Heart Tube FormationV. D. VARNER<sup>1</sup>, AND L. A. TABER<sup>1</sup>  
<sup>1</sup>Washington University, Saint Louis, MO**10:45AM OP-7-1-7B** Computational Modeling of Eccentric and Concentric Cardiac Growth through SarcomerogenesisS. GOKTEPE<sup>1</sup>, O. J. ABILEZ<sup>1</sup>, K. K. PARKER<sup>2</sup>, AND E. KUHL<sup>1</sup>  
<sup>1</sup>Stanford University, Stanford, CA, <sup>2</sup>Harvard University, Cambridge, MA**11:00AM OP-7-1-7C** Systems Analysis of the Cardiac Hypertrophy Signaling Network Using Automated ImagingK. A. RYALL<sup>1</sup>, AND J. J. SAUCERMAN<sup>1</sup>  
<sup>1</sup>University of Virginia, Charlottesville, VA**11:15AM OP-7-1-7D** Left Ventricular Wall Mechanics Improve During Endocardial Pacing In the Dyssynchronous Canine HeartE. J. HOWARD<sup>1</sup>, J. W. COVELL<sup>1</sup>, L. J. MULLIGAN<sup>2</sup>, A. D. MCCULLOCH<sup>1</sup>, J. H. OMENS<sup>1</sup>, AND R. C. KERCKHOFFS<sup>1</sup>  
<sup>1</sup>University of California, San Diego, La Jolla, CA, <sup>2</sup>Medtronic Inc., Mounds View, MN

**11:30AM OP-7-1-7E** Diffusion Tensor MRI Mapping of Two Local Myocardial Sheet Orientations with Histological ValidationG. L. KUNG<sup>1</sup>, T. C. NGUYEN<sup>2</sup>, A. ITOH<sup>2</sup>, S. SKARE<sup>2</sup>, N. B. INGELS JR.<sup>2</sup>, D. C. MILLER<sup>2</sup>, AND D. B. ENNIS<sup>1</sup><sup>1</sup>University of California, Los Angeles, CA, <sup>2</sup>Stanford University, Stanford, CA**11:45AM OP-7-1-7F** Novel Papillary Muscle Force Transducer: Tests and ResultsJ. B. ASKOV<sup>1,2</sup>, J. L. HONGE<sup>1</sup>, M. O. JENSEN<sup>1,2</sup>, H. NYGAARD<sup>1,2</sup>, J. M. HASENKAM<sup>1</sup>, AND S. L. NIELSEN<sup>1</sup><sup>1</sup>Aarhus University Hospital, Aarhus N, Aarhus, Denmark, <sup>2</sup>Engineering College of Aarhus, Aarhus C, Aarhus, Denmark**Track: Cardiovascular Engineering – 7-1-8**  
**Cardiovascular Fluid Dynamics – I****Chairs:** Alberto Aliseda, Wei Yin  
*Room 18D***10:30AM OP-7-1-8A** A Hemodynamic Comparison at Intracranial Bifurcations with Different Propensities for AneurysmsJ. M. ALFANO<sup>1</sup>, S. K. NATARAJAN<sup>1</sup>, AND H. MENG<sup>1</sup><sup>1</sup>State University of New York at Buffalo, Buffalo, NY**10:45AM OP-7-1-8B** Relationship of E and A Wave Pressure Distribution to Diastolic DysfunctionC. NIEBEL<sup>1</sup>, K. STEWART<sup>1</sup>, R. KUMAR<sup>2</sup>, T. OHARA<sup>2</sup>, P. VLACHOS<sup>1</sup>, AND W. LITTLE<sup>2</sup><sup>1</sup>Virginia Tech, Blacksburg, VA, <sup>2</sup>Wake Forest University Baptist Medical Center, Winston Salem, NC**11:00AM OP-7-1-8C** A New Insight into the Mechanism of Atrial Fibrillation Induced Endothelial Dysfunction: The Detrimental Effects of Irregular Shear StressN. JEN<sup>1</sup>, T. HSIAI<sup>1</sup>, AND H. MOHAMED<sup>2</sup><sup>1</sup>University of Southern California, Los Angeles, CA, <sup>2</sup>University of Utah, Salt Lake City, UT**11:15AM OP-7-1-8D** The Relationship Between Shear and Mass Transport in the Carotid Artery BifurcationR. GORDER<sup>1</sup>, AND A. ALISEDA<sup>1</sup><sup>1</sup>University of Washington, Seattle, WA**11:30AM OP-7-1-8E** Characterization of Pulsatile Flow in the Human Carotid Bifurcation with AgeW. JEONG<sup>1</sup>, AND J. SEONG<sup>1</sup><sup>1</sup>University of Central Oklahoma, Edmond, OK**11:45AM OP-7-1-8F** Pathological Shear Condition Alters Platelet Complement ActivationS. SHANMUGAVELAYUDAM<sup>1</sup>, D. A. RUBENSTEIN<sup>1</sup>, AND W. YIN<sup>1</sup><sup>1</sup>Oklahoma State University, Stillwater, OK**Track: Orthopedic and Rehabilitation Engineering – 7-1-9****Orthopedic Bioengineering & Imaging****Chairs:** Luis Cardoso, Yu Chen, Ron Mauck  
*Room 17A***10:30AM OP-7-1-9A** An Ultrasonic Method for Determining the Mechanical Properties of Ovine Tibia under Cyclic LoadingL. LIN<sup>1</sup>, F. SERRA-HSU<sup>1</sup>, S. FERRERI<sup>1</sup>, J. CHENG<sup>1</sup>, AND Y-X. QIN<sup>1</sup><sup>1</sup>State University of New York at Stony Brook, Stony Brook, NY**10:45AM OP-7-1-9B** Using Ultrasound Elastography to Characterize Aging Induced Muscle DegradationM. J. LEINWEBER<sup>1</sup>, A. COCHRAN<sup>1</sup>, AND Y. GAO<sup>1</sup><sup>1</sup>Cornell University, Ithaca, NY**11:00AM OP-7-1-9C** The Application of Micro-CT Arthrography in 3D Geometric Reconstruction of Soft and Hard Tissues in Small Animal Joint ModelX. I. GU<sup>1</sup>, D. J. LEONG<sup>1,2</sup>, N. MALDONADO<sup>3</sup>, E. WILLIAMS<sup>3</sup>, H. B. SUN<sup>1,2</sup>, AND L. CARDOSO<sup>1</sup><sup>1</sup>The Graduate Center and The City College of The City University of New York, New York, NY, <sup>2</sup>Mount Sinai School of Medicine, New York, NY, <sup>3</sup>City College of New York, New York, NY**11:15AM OP-7-1-9AD** Local Delivery of Sphingosine 1-Phosphate Receptor-Specific Drugs Enhances Allograft IncorporationC. S. HUANG<sup>1</sup>, AND E. A. BOTCHWEY<sup>1</sup><sup>1</sup>University of Virginia, Charlottesville, VA**11:30AM OP-7-1-9E** Perineural Delivery of sTNFRII Attenuates Symptoms Associated with Lumbar Radiculopathy in the RatK. D. ALLEN<sup>1</sup>, M. F. SHAMJI<sup>2</sup>, B. A. MATA<sup>1</sup>, M. GABR<sup>3</sup>, S. M. SINCLAIR<sup>1</sup>, P. Y. HWANG<sup>1</sup>, W. J. RICHARDSON<sup>1</sup>, AND L. A. SETTON<sup>1</sup><sup>1</sup>Duke University, Durham, NC, <sup>2</sup>Ottawa Hospital, Ottawa, Ontario, Canada**11:45AM OP-7-1-9F** Response of Pain Receptors in the Midbrain due to Painful RadiculopathyP. Y. HWANG<sup>1</sup>, M. F. SHAMJI<sup>2</sup>, L. JING<sup>1</sup>, M. GABR<sup>3</sup>, B. A. MATA<sup>3</sup>, K. D. ALLEN<sup>3</sup>, J. CHEN<sup>1</sup>, W. J. RICHARDSON<sup>3</sup>, AND L. A. SETTON<sup>1,3</sup><sup>1</sup>Duke University Department of Biomedical Engineering, Durham, NC, <sup>2</sup>Division of Neurosurgery, Ottawa Hospital, Ottawa, ON, Canada, <sup>3</sup>Duke University Department of Orthopaedic Surgery, Durham, NC**Track: Systems Biology, Bioinformatics and Computational Biology – 7-1-10****High-throughput Computational Biology****Chairs:** May Wang  
*Room 17B***10:30AM OP-7-1-10A** Rewirable Gene Regulatory Networks in Mammalian Preimplantation Embryonic DevelopmentD. XIE<sup>1</sup>, C-C. CHEN<sup>1</sup>, L. PTASZEK<sup>2</sup>, S. XIAO<sup>1</sup>, X. CAO<sup>1</sup>, L. HARRIS<sup>1</sup>, C. COWAN<sup>2</sup>, AND S. ZHONG<sup>1</sup><sup>1</sup>University of Illinois at Urbana-Champaign, Urbana, IL, <sup>2</sup>Massachusetts General Hospital, Boston, MA**10:45AM OP-7-1-10B** Ablation of HSV-1 Replication by Drug Combinations Developed through Feedback System ControlX. DING<sup>1</sup>, D. J. SANCHEZ<sup>1</sup>, A. SHAHANGIAN<sup>1</sup>, G. CHENG<sup>1</sup>, AND C-M. HO<sup>1</sup><sup>1</sup>University of California, Los Angeles, Los Angeles, CA**11:00AM OP-7-1-10C** Data-Driven Modeling Enhances Oncolytic Adenovirus TherapyN. BAGHERI<sup>1</sup>, M. SHIINA<sup>2</sup>, W. M. KORN<sup>2</sup>, AND D. LAUFFENBURGER<sup>1</sup><sup>1</sup>MIT, Cambridge, MA, <sup>2</sup>UCSF, San Francisco, CA**11:15AM OP-7-1-10D** Adaptive Model Predictive Control of Human Promyelocytic Leukemia Cell DifferentiationS. L. NOBLE<sup>1</sup>, AND A. E. RUNDELL<sup>1</sup><sup>1</sup>Purdue University, West Lafayette, IN**11:30AM OP-7-1-10E** Mutagenic HIV Promoter Library Uncovers Core Constitutive Transcription Factor Binding Sites That Modify Gene Expression NoiseK. MILLER-JENSEN<sup>1,2</sup>, AND D. V. SCHAFFER<sup>2</sup><sup>1</sup>Yale University, New Haven, CT, <sup>2</sup>UC Berkeley, Berkeley, CA

**11:45AM OP-7-1-10F** Measurements and Computational Modeling of Cerebrospinal Fluid Flow in HumansB. J. SWEETMAN<sup>1</sup>, A. A. LINNINGER<sup>1</sup>, AND R. PENN<sup>1</sup>  
<sup>1</sup>University of Illinois at Chicago, Chicago, IL**Track:AIMBE – 7-1-11****AIMBE Session**

Room 16A

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

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

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

**Track: Devices: Nano to Micro – 7-1-12****Biomems and Nanotech for Cellular Engineering**Chairs: Xuanhong Chen, Tejal Desai  
Room 16B**10:30AM OP-7-1-12A** Detecting Cell-Adhesive Sites in Extracellular Matrix using Force Spectroscopy MappingS. CHIRASATITSIN<sup>1</sup>, AND A. J. ENGLER<sup>1</sup>  
<sup>1</sup>University of California, San Diego, La Jolla, CA**10:45AM OP-7-1-12B** Oxygen Gradients for Open Well Cellular Cultures via Microfluidic SubstratesJ. LO<sup>1</sup>, AND D. T. EDDINGTON<sup>1</sup>  
<sup>1</sup>University of Illinois, Chicago, IL**11:00AM OP-7-1-12C** Patterning Cells Over Diamond-Like Carbon Electrochemical Electrodes Using Parylene C MicrowellsJ. Yao<sup>1,2</sup>, C. J. Mathai<sup>1</sup>, S. Gangopadhyay<sup>1</sup>, and K. D. Gillis<sup>1,2</sup>  
<sup>1</sup>University of Missouri, Columbia, MO, <sup>2</sup>Dalton Cardiovascular Research Center, Columbia, MO**11:15AM OP-7-1-12D** Real-time Live Cell Array for Monitoring Gene Expression in Mesenchymal Stem Cell DifferentiationP. LEI<sup>1</sup>, J. TIAN<sup>1</sup>, J. MOHARIL<sup>1</sup>, P. XU<sup>1</sup>, C. P. SCHAFFER<sup>1</sup>, AND S. T. ANDREADIS<sup>1,2</sup>  
<sup>1</sup>University at Buffalo-SUNY, Amherst, NY, <sup>2</sup>Center of Excellence in Bioinformatics and Life Sciences, Buffalo, NY**11:30AM OP-7-1-12E** A Single Cell Trapping Microarray and Automated Tracking of Clonal ExpansionA. J. RETTIE<sup>1</sup>, T. CHANG<sup>1</sup>, W. C. WATT<sup>1</sup>, AND A. FOLCH<sup>1</sup>  
<sup>1</sup>University of Washington, Seattle, WA**11:45AM OP-7-1-12F** Identification of Angiogenic Factors Through Reconfigurable Co-CulturesM. Y. KIM<sup>1</sup>, A. C. NEWMAN<sup>1</sup>, K. M. SPENCER<sup>1</sup>, P. H. CHAO<sup>1</sup>, K. L. DOOLEY<sup>1</sup>, C. C. HUGHES<sup>1</sup>, AND E. E. HUI<sup>1</sup>  
<sup>1</sup>University of California, Irvine, Irvine, CA**Track: Drug Delivery Systems \* – 7-1-13****Nucleic Acid Delivery – I**Chairs: Michelle Dawson, Craig Duvall  
Room 14**10:30AM OP-7-1-13A** Mediators of Intracellular Trafficking Enhance Transgene Expression Efficacy of Polymer-Plasmid DNA ComplexesS. BARUA<sup>1</sup>, J. RAMOS<sup>1</sup>, J. LEHRMAN<sup>1</sup>, AND K. REGE<sup>1</sup>  
<sup>1</sup>Arizona State University, Tempe, AZ**10:45AM OP-7-1-13B** Intracellular Transport of Linear-Dendritic Block Copolymer DNA Polyplexes: Characterization and ModulationD. BONNER<sup>1</sup>, C. LEUNG<sup>1</sup>, R. LANGER<sup>1</sup>, AND P. HAMMOND<sup>1</sup>  
<sup>1</sup>MIT, Cambridge, MA**11:00AM OP-7-1-13C** Self-Assembling DNA Nanostructures: Novel Carriers for Drug DeliveryH. LI<sup>1</sup>, Y-P. HO<sup>1</sup>, T. LABEAN<sup>2</sup>, AND K. LEONG<sup>1</sup>  
<sup>1</sup>Department of Biomedical Engineering, Duke University, Durham, NC, <sup>2</sup>Department of Chemistry, Duke University, Durham, NC**11:15AM OP-7-1-13D** - Novel Polymeric Nanoparticles as Gene Delivery Vectors for Treatment of Cystic FibrosisR. J. FIELDS<sup>1</sup>, C. CHENG<sup>1</sup>, C. HOIMES<sup>1</sup>, T. PATEL<sup>1</sup>, M. EGAN<sup>1</sup>, AND W. M. SALTZMAN<sup>1</sup>  
<sup>1</sup>Yale University, New Haven, CT**11:30AM OP-7-1-13E** Fibrin-conjugated VSV-g pseudotyped lentiviruses for localized gene delivery and live cell microarray applicationsR. M. PADMASHALI<sup>1</sup>, AND S. ANDREADIS<sup>1</sup>  
<sup>1</sup>University of Buffalo, Buffalo, NY**11:45AM OP-7-1-13F** Directed Evolution Yields Novel Adeno-Associated Virus Variants that Cross the Blood-Brain BarrierJ. M. BERGEN<sup>1</sup>, AND D. V. SCHAFFER<sup>1</sup>  
<sup>1</sup>UC Berkeley, Berkeley, CA

\* Drug Delivery Systems Track is sponsored by Acta Biomaterialia



**Track: New Frontiers in Bioengineering – 7-1-14****Immunobioengineering – I****Chairs:** George Georgiou, Jennifer Maynard**Room 15****10:30AM OP-7-1-14A** Rapid Generation of Monoclonal Antibodies Without Screening by Exploiting High-throughput DNA Sequencing of Immunized RepertoiresS. T. REDDY<sup>1</sup>, X. GE<sup>1</sup>, AND G. GEORGIU<sup>1</sup><sup>1</sup>University of Texas Austin, Austin, TX**10:45AM OP-7-1-14B** Palmitoylation Regulates Raft Affinity for the Majority of Cell Surface ProteinsI. LEVENTAL<sup>1</sup>, D. LINGWOOD<sup>1</sup>, AND K. SIMONS<sup>1</sup><sup>1</sup>Max Planck Institute for Cell Biology and Genetics, Dresden, Germany**11:00AM OP-7-1-14C** Designing Synthetic, Modular Peptide Antigen Delivery Systems Using Self-Assembling Peptide AmphiphilesA. TRENT<sup>1</sup>, M. BLACK<sup>1</sup>, AND M. TIRRELL<sup>2</sup><sup>1</sup>University of California, Santa Barbara, Berkeley, CA, <sup>2</sup>University of California, Berkeley, Berkeley, CA**11:15AM OP-7-1-14D** High-Throughput Sequencing: Antibody Repertoire Development in ZebrafishN. JIANG<sup>1</sup>, J. WEINSTEIN<sup>1</sup>, L. PENLAND<sup>1</sup>, R. WHITE III<sup>1</sup>, D. FISHER<sup>1</sup>, AND S. QUAKE<sup>1</sup><sup>1</sup>Stanford University, Stanford, CA**11:30AM OP-7-1-14E** Controlled Antigen Release in Mucosa for Oral VaccinationT. A. KHAN<sup>1</sup>, AND J. A. MAYNARD<sup>1</sup><sup>1</sup>The University of Texas at Austin, Austin, TX**11:45AM OP-7-1-14F** Novel Methods for the Discovery of Highly Potent Therapeutic AntibodiesX. GE<sup>1</sup>, AND G. GEORGIU<sup>1</sup><sup>1</sup>University of Texas, Austin, TX**Track: Tissue Engineering \* – 7-1-15****Nano- and Micro-Engineering in Tissue Engineering – I****Chairs:** Ketul Popat, Jessica Winter**Ballroom E****10:30AM OP-7-1-15A** Multivalent Ephrin-B2 Bioconjugates Enhance Neuronal Differentiation of Neural Stem CellsA. CONWAY<sup>1</sup>, R. ASHTON<sup>1</sup>, AND D. V. SCHAFFER<sup>1</sup><sup>1</sup>University of California, Berkeley, Berkeley, CA**10:45AM OP-7-1-15B** Multivalency Enhances the Potency of Sonic Hedgehog in Dopaminergic Differentiation of hESCsR. S. ASHTON<sup>1</sup>, J. POLLOCK<sup>1</sup>, K. HEALY<sup>1</sup>, R. S. KANE<sup>2</sup>, AND D. V. SCHAFFER<sup>1</sup><sup>1</sup>University of California Berkeley, Berkeley, CA, <sup>2</sup>Rensselaer Polytechnic Institute, Troy, NY**11:00AM OP-7-1-15C** Bioactive and Protein-like Synthetic Nanostructures From Peptide AmphiphilesW. SUH<sup>1</sup>, G. D. STUCKY<sup>2</sup>, AND M. V. TIRRELL<sup>1</sup><sup>1</sup>University of California, Berkeley, Berkeley, CA, <sup>2</sup>University of California, Santa Barbara, Santa Barbara, CA**11:15AM OP-7-1-15D** Synergistic Effect of Anisotropic Adhesive Cues on Neurite OutgrowthS. N. MASAND<sup>1</sup>, H. SUNDARARAGHAVAN<sup>2</sup>, AND D. SHREIBER<sup>1</sup><sup>1</sup>Rutgers, The State University of New Jersey, Piscataway, NJ, <sup>2</sup>The University of Pennsylvania, Philadelphia, PA**11:30AM OP-7-1-15E** Guided Assembly of Insulin-Expressing Islet-Like Cell Clusters on Polymeric Micro/NanowellsD. GALLEG0-PEREZ<sup>1</sup>, N. HIGUITA-CASTRO<sup>1</sup>, R. REEN<sup>1</sup>, M. PALACIO OCHOA<sup>1,2</sup>, S. SHARMA<sup>1</sup>, L. LEE<sup>1</sup>, J. LANNUTTI<sup>1</sup>, D. HANSFORD<sup>1</sup>, AND K. GOOCH<sup>1</sup><sup>1</sup>The Ohio State University, Columbus, OH, <sup>2</sup>Antioquia School of Engineering, Envigado, Antioquia, Colombia**11:45AM OP-7-1-15F** Optimization of Nano-scale Perfluorocarbon Emulsions for use in Cellular EncapsulationC. FRAKER<sup>1</sup>, AND C. L. STABLER<sup>1</sup><sup>1</sup>University of Miami, Miami, FL**\*Tissue Engineering Track sponsored by Kinetic Concepts, Inc.****Track: Tissue Engineering \* – 7-1-16****Neural Tissue Engineering – I****Chairs:** Kacy Cullen, Jennie Leach**Ballroom F****10:30AM OP-7-1-16A** Attention to Materials and Pore Structure Leads to Regeneration of Dura MaterP. B. SNOWHILL<sup>1</sup>, R. D. HUBBARD<sup>1</sup>, P. K. ALKEMA<sup>1</sup>, AND G. J. POMRINK<sup>1</sup><sup>1</sup>Integra LifeSciences, Plainsboro, NJ**10:45AM OP-7-1-16AB** Glycomimetic Functionalized Scaffolds for Peripheral Nerve RegenerationS. N. MASAND<sup>1</sup>, B. HAMMERLING<sup>1</sup>, I. PERRON<sup>2</sup>, J. CHEN<sup>1</sup>, M. SCHACHNER<sup>1</sup>, AND D. SHREIBER<sup>1</sup><sup>1</sup>Rutgers, The State University of New Jersey, Piscataway, NJ, <sup>2</sup>Rutgers, The State University of New Jersey, Philadelphia, NJ**11:00AM OP-7-1-16C** Injection of Schwann Cells into Acellular Cold-Preserved Nerve Grafts to Enhance Nerve RegenerationN. JESURAJ<sup>1</sup>, K. SANTOSA<sup>2</sup>, M. MACEWAN<sup>1,2</sup>, A. MOORE<sup>2</sup>, R. KASUKURTHI<sup>2</sup>, W. RAY<sup>2</sup>, E. FLAGG<sup>2</sup>, D. HUNTER<sup>2</sup>, G. BORSCHEL<sup>2,3</sup>, P. JOHNSON<sup>2</sup>, S. MACKINNON<sup>2</sup>, AND S. SAKIYAMA-ELBERT<sup>1</sup><sup>1</sup>Washington University in St. Louis, St. Louis, MO, <sup>2</sup>Washington University School of Medicine, St. Louis, MO, <sup>3</sup>University of Toronto, Toronto, Ontario, Canada**11:15AM OP-7-1-16AD** Hydrolytically Degradable Poly(ethylene glycol) Hydrogel as a Tunable Scaffold for Neural Tissue EngineeringS. P. ZUSTIAK<sup>1</sup>, AND J. B. LEACH<sup>1</sup><sup>1</sup>UMBC, Chemical & Biochemical Engineering, Baltimore, MD**11:30AM OP-7-1-16E** Hyaluronic Acid Scaffolds for Repair Strategies after Cervical Spinal Cord InjuryZ. Z. KHAING<sup>1</sup>, S. GEISSLER<sup>1</sup>, S. V. AGUILAR<sup>1</sup>, T. SCHALLERT<sup>1</sup>, AND C. E. SCHMIDT<sup>1</sup>UT Austin, Austin, TX**11:45AM OP-7-1-16F** Mouse Embryonic Stem Cell-derived Progenitor Motor Neurons for Transplantation After Spinal Cord InjuryD. MCCREEDY<sup>1</sup>, AND S. SAKIYAMA-ELBERT<sup>1</sup><sup>1</sup>Washington University in St. Louis, St. Louis, MO**\*Tissue Engineering Track sponsored by Kinetic Concepts, Inc.**

**Track: Tissue Engineering \* – 7-1-17****Musculoskeletal Tissue Engineering – I****Chairs:** Jeffrey Jacot, Johnna Temenoff**Ballroom G****10:30AM OP-7-1-17A** Co-regulation of Tendon and Muscle Progenitor Cells Via Paracrine Signaling in a 3D Culture SystemA. H. THOMAS<sup>1</sup>, A. G. BURBANK<sup>1</sup>, AND C. K. KUO<sup>1</sup><sup>1</sup>Tufts University, Medford, MA**10:45AM OP-7-1-17B** Selective Activation of Phospholipid Receptors Affects Progenitor Cell RecruitmentM. R. TINIU<sup>1</sup>, AND E. A. BOTCHWEY<sup>1</sup><sup>1</sup>University of Virginia, Charlottesville, VA**11:00AM OP-7-1-17C** Bone Marrow Stromal Cell Recruitment Enhances Local SIP Receptor-Initiated Vascular RemodelingA. O. AWOJODU<sup>1</sup>, L. S. SEFCIK<sup>1</sup>, B. R. WAMHOFF<sup>2</sup>, S. M. PEIRCE-COTTLER<sup>1</sup>, AND E. A. BOTCHWEY<sup>1</sup><sup>1</sup>University of Virginia - Department of Biomedical Engineering, Charlottesville, VA, <sup>2</sup>University of Virginia - Department of Cardiovascular Medicine, Charlottesville, VA**11:15AM OP-7-1-17D** Comparison of C2C12 Myoblast Line and Primary Human Skeletal Myoblasts for Muscle Tissue-EngineeringC. S. CHENG<sup>1</sup>, R. HARBUCK<sup>1</sup>, Y. EL-ABD<sup>1</sup>, W. E. KRAUS<sup>2</sup>, AND G. A. TRUSKEY<sup>1</sup><sup>1</sup>Duke University, Durham, NC, <sup>2</sup>Duke University Medical Center, Durham, NC**11:30AM OP-7-1-17E** Contractile Force of Engineered Skeletal Muscle Depends on Myofiber Density and Local AlignmentW. BIAN<sup>1</sup>, AND N. BURSAC<sup>1</sup><sup>1</sup>Duke University, Durham, NC**11:45AM OP-7-1-17F** Functional Restoration of Skeletal Muscle Defects Using Bioengineered Skeletal Muscle in RodentsM. MACHINGAL<sup>1,2</sup>, B. T. CORONA<sup>1</sup>, V. KESIREDDY<sup>1</sup>, W. ZHAO<sup>1</sup>, J. J. YOO<sup>1</sup>, AND G. J. CHRIST<sup>1</sup><sup>1</sup>Wake Forest Institute for Regenerative Medicine, Winston Salem, NC, <sup>2</sup>VT-WFU School of Biomedical Engineering and Sciences, Winston Salem, NC**\*Tissue Engineering Track sponsored by Kinetic Concepts, Inc.****Whitaker International Fellows and Scholars Program****10:30am - 12:00noon***Hilton Austin, Room 602*

**Track: Biomedical Engineering Education – PS-7B-1****Teaching Tools and Strategies****PS-7B-1-1** MU Bidesign & Innovation ProgramM. JAHNSEN<sup>1</sup>, P. DALE<sup>1</sup>, AND G. SCHELLER<sup>1</sup><sup>1</sup>University of Missouri, Columbia, MO**PS-7B-1-2** MOVED TO OP-9-3-5F**PS-7B-1-3** Fellowships in Research and Science Teaching (FIRST): A Unique Comprehensive Postdoctoral ExperienceS. E. STABENFELDT<sup>1</sup>, A. EISEN<sup>2</sup>, AND D. C. EATON<sup>2</sup><sup>1</sup>Georgia Institute of Technology / Emory University, Atlanta, GA, <sup>2</sup>Emory University, Atlanta, GA**Track: Biomedical Imaging and Optics – PS-7B-2****Teaching Tools and Strategies****PS-7B-2-4** Multiple Materials Density Calibration of Subject-specific Jaw and Vertebrae Bones for Mechanical Behavior Prediction by FEM ModellingJ. A. RAMOS<sup>1</sup>, A. VARGAS<sup>1</sup>, F. ALISTER<sup>1</sup>, F. SAHLI<sup>1</sup>, AND M. CAMPOS<sup>1</sup><sup>1</sup>Pontificia Universidad Catolica de Chile, Santiago, RM, Chile**Track: Cardiovascular Engineering – PS-7B-3****In Vitro and Multi-scale Models of Cardiovascular Disease****PS-7B-3-5** Cyclic Stretch Induces Endothelial to Mesenchymal Transdifferentiation in Mitral Valve Endothelial CellsK. BALACHANDRAN<sup>1,2</sup>, J. WYLIE-SEARS<sup>3</sup>, J. BISCHOFF<sup>3,4</sup>, E. AIKAWA<sup>4,5</sup>, R. A. LEVINE<sup>4,6</sup>, AND K. K. PARKER<sup>1,2</sup><sup>1</sup>Disease Biophysics Group, School of Engineering and Applied Sciences, Harvard University, Cambridge, MA, <sup>2</sup>Wyss Institute for Biologically Inspired Engineering, Harvard University, Boston, MA, <sup>3</sup>Children's Hospital Boston, Boston, MA, <sup>4</sup>Harvard Medical School, Boston, MA, <sup>5</sup>Brigham and Women's Hospital, Boston, MA, <sup>6</sup>Massachusetts General Hospital, Boston, MA**PS-7B-3-6** High Contrast MicroCT Imaging of Coronary Arteries with Vulnerable Plaque for Biomechanical ModelingA. A. KELLY<sup>1</sup>, N. MALDONADO<sup>1</sup>, S. CHAKRABORTI<sup>1</sup>, Y. VENGRENYUK<sup>2</sup>, L. CARDOSO<sup>1</sup>, AND S. WEINBAUM<sup>1</sup><sup>1</sup>City College of New York, New York, NY, <sup>2</sup>New York University, New York, NY**PS-7B-3-7** Postprandial Triglyceride-Rich Lipoproteins Differentially Modulate Vascular Endothelial Cell Inflammatory ResponsesY. I. WANG<sup>1</sup>, J. SCHULZE<sup>1</sup>, S. I. SIMON<sup>1</sup>, AND A. G. PASSERINI<sup>1</sup><sup>1</sup>University of California, Davis, Davis, CA**Track: Cardiovascular Engineering – PS-7B-4****Microvasculature, Angiogenesis, and Capillary Patches****PS-7B-4-8** Highly Permeable Silicon Nanomembranes Promote Endothelial Vacuolization and Tube FormationB. J. NEHILLA<sup>1</sup>, N. PETUKHOV<sup>2</sup>, AND J. L. MCGRATH<sup>1</sup><sup>1</sup>University of Rochester, Rochester, NY, <sup>2</sup>Webster High School, Webster, NY**PS-7B-4-9** Image-based Quantification of Vascular Network Development Within a Perfusion CircuitJ. A. RYTLEWSKI<sup>1</sup>, L. GEUSS<sup>1</sup>, AND L. J. SUGGS<sup>1</sup><sup>1</sup>UT Austin, Austin, TX**PS-7B-4-10** Fibronectin Polymerization and Actin Polarization Drive VasculogenesisJ. P. CALIFANO<sup>1</sup>, AND C. A. REINHART-KING<sup>1</sup><sup>1</sup>Cornell University, Ithaca, NY**PS-7B-4-11** Modeling the Angiogenic Response of the Neurovasculature in IschemiaR. REKHI<sup>1</sup>, A. AREVALOS<sup>1</sup>, J. JUNG<sup>1</sup>, B. LONG<sup>1</sup>, AND A. A. QUTUB<sup>1</sup><sup>1</sup>Rice University, Houston, TX**PS-7B-4-12** Fibril Alignment Improves Microvasculature Formation by Human Blood Outgrowth Endothelial Cells in Fibrin GelK. T. MORIN<sup>1</sup>, AND R. T. TRANQUILLO<sup>1</sup><sup>1</sup>University of Minnesota, Minneapolis, MN**PS-7B-4-13** - Impact of Extracellular Matrix Stiffness on Angiogenic PatterningP-F. LEE<sup>1</sup>, K. J. BAYLESS<sup>1</sup>, AND A. T. YE<sup>1</sup><sup>1</sup>Texas A&M University, College Station, TX**PS-7B-4-14** Tissue Stiffness and Microvascularized Tissue DevelopmentA-C. LIN<sup>1</sup>, AND C. MILLER<sup>1</sup><sup>1</sup>Saint Louis University, St Louis, MO**PS-7B-4-15** Gradient Deposition of Growth Factors Via Electrospinning for Precise Spatiotemporal Angiogenic TherapiesR. B. MONTERO<sup>1</sup>, AND F. M. ANDREOPOULOS<sup>1</sup><sup>1</sup>University of Miami, Coral Gables, FL**PS-7B-4-16** Modulation of NO Bioavailability by Red Blood Cells in MicrocirculationP. DEONIKAR<sup>1</sup>, AND M. KAVDIA<sup>1</sup><sup>1</sup>University of Arkansas, Fayetteville, AR**PS-7B-4-17** Shear Stress Controls Capillary Sprouting in a Microfluidic DeviceJ. W. SONG<sup>1</sup>, AND L. L. MUNN<sup>1</sup><sup>1</sup>Massachusetts General Hospital/Harvard Medical School, Charlestown, MA**PS-7B-4-18** Bio-CAD for Tissue Scaffolding for Transplant Therapy of Congenital Hypoplasia of the Left VentricleW. L. MONDY<sup>1</sup>, J. G. JACOT<sup>2,3</sup>, AND C. CASTELEYN<sup>4</sup><sup>1</sup>Baylor College of Medicine, Houston, TX, <sup>2</sup>Rice University, Houston, TX, <sup>3</sup>Texas Children's Hospital, Houston, TX, <sup>4</sup>Ghent University, Ghent, East Flanders, Belgium**PS-7B-4-19** CANCELED**PS-7B-4-20** Influence of Permeability on Shear Stress Distribution Along Capillary SproutsW. WANG<sup>1</sup>, P. C. STAPOR<sup>1</sup>, W. L. MURFEE<sup>1</sup>, AND D. B. KHISMATULLIN<sup>1</sup><sup>1</sup>Tulane University, New Orleans, LA**PS-7B-4-21** Effect of Antiangiogenic Agents on Tumor Vasculature and Microenvironment in Orthotopic Tumor ModelsD. A. LACORRE<sup>1</sup>, W. S. KAMOUN<sup>1</sup>, J. Y. PERENTES<sup>1</sup>, S. V. KOZIN<sup>1</sup>, E. DI TOMASO<sup>1</sup>, D. G. DUDA<sup>1</sup>, R. K. JAIN<sup>1</sup>, AND L. L. MUNN<sup>1</sup><sup>1</sup>Edwin L. Steele Laboratory, Massachusetts General Hospital, Boston, MA**PS-7B-4-22** Novel Reducible L-Lysine Copolymers as a Nonviral Gene Carrier for Ischemic Heart DiseaseM. ISMAIL NOUNOU<sup>1</sup>, S. CHUNG<sup>1</sup>, K. EMMANOUIL<sup>1</sup>, T. PHAM<sup>1</sup>, Z. LU<sup>1</sup>, B. MCCONNELL<sup>1</sup>, AND M. BIKRAM<sup>1</sup><sup>1</sup>University of Houston, Houston, TX**PS-7B-4-23** The Interplay of Cyclic Strain and Vascular Endothelial Growth Factor in rRegulating AngiogenesisJ. WILKINS<sup>1</sup>, A. KUBOTA<sup>1</sup>, AND Y-T. E. SHIU<sup>1,2</sup><sup>1</sup>Department of Bioengineering, University of Utah, Salt Lake City, UT, <sup>2</sup>Department of Medicine, University of Utah, Salt Lake City, UT

**PS-7B-4-24** A Mathematical Framework for Predicting Oxygen Transport and Vessel Remodeling in TumorsJ. A. TYRRELL<sup>1</sup>, W. S. KAMOUN<sup>2</sup>, AND L. L. MUNN<sup>3</sup><sup>1</sup>Thomson Reuters, New York, NY, <sup>2</sup>Massachusetts General Hospital, Boston, MA, <sup>3</sup>Harvard Medical School, Charlestown, MA**PS-7B-4-25** A Bottom-Up Approach To Vascular Tissue EngineeringS. COLLINS<sup>1</sup>, AND Y-J. GENG<sup>1</sup><sup>1</sup>UT Health Science Center-Houston, Houston, TX**Track: Cellular and Molecular Engineering – PS-7B-5****Cellular and Sub-cellular Imaging****PS-7B-5-26** Visualizing Calcium Signaling in Live Endothelial Cells Under Mechanical VibrationW. S. NISHITANI<sup>1</sup>, T. A. SAIF<sup>1</sup>, AND Y. WANG<sup>1</sup><sup>1</sup>University of Illinois at Urbana-Champaign, Urbana, IL**PS-7B-5-27** Molecular Engineering and Live Cell ImagingY. WANG<sup>1</sup><sup>1</sup>University of Illinois at Urbana Champaign, Urbana, IL**PS-7B-5-28** Deriving Volume-based Mass Profiles Using Confocal Microscopy and Time-lapse Dark Field ImagingL. MILLET<sup>1</sup>, K. PARK<sup>1</sup>, AND R. BASHIR<sup>1</sup><sup>1</sup>University of Illinois at Urbana Champaign, Urbana, IL**PS-7B-5-29** Strategies to Modulate Calcium Signals and Induce Calcium InfluxE. PHAM<sup>1</sup>, AND K. TRUONG<sup>1</sup><sup>1</sup>University of Toronto, Toronto, Ontario, Canada**PS-7B-5-30** Using X-ray Tomography to Get a Three-Dimensional Representation of Cell Growth in ScaffoldsJ. CARTER<sup>1</sup>, AND C. AGRAWAL<sup>1</sup><sup>1</sup>University of Texas San Antonio, San Antonio, TX**PS-7B-5-31** Quantitative Analysis of Glucocorticoid Receptor Sub-Cellular Movement in Sheared Endothelial CellsA. NAYEBOSADRI<sup>1</sup>, AND J. Y. JI<sup>2</sup><sup>1</sup>Purdue University, West Lafayette, IN, <sup>2</sup>Indiana University Purdue University Indianapolis, Indianapolis, IN**PS-7B-5-32** Ligand Binding Effects on Lateral Diffusion of Host Cell Receptors at HIV-1 Virological SynapseR. KALYANA SUNDARAM<sup>1</sup>, A. BASTIAN<sup>1</sup>, G. ENG<sup>2</sup>, K. MCFADDEN<sup>3</sup>, M. CONTARINO<sup>3</sup>, I. M. CHAIKEN<sup>3</sup>, AND E. S. PAPAZOGLU<sup>1</sup><sup>1</sup>Drexel University, Philadelphia, PA, <sup>2</sup>Duke University, Durham, NC, <sup>3</sup>Drexel University College of Medicine, Philadelphia, PA**PS-7B-5-33** SIRT1 Inhibition Induces Oxidative Stress in Endothelial CellsD. T. NGUYEN<sup>1</sup>, AND M. KAVDIA<sup>1</sup><sup>1</sup>University of Arkansas, Fayetteville, AR**Track: Devices: Nano to Micro – PS-7B-6****Biosensors, Bio-Interfaces and Implantable Devices****PS-7B-6-34** Non-labeled, Real-time Detection of HINI DNA Hybridization Using Combined QCM-D and EIS SystemS. P. PRIETO<sup>1</sup>, AND H. J. KWON<sup>1</sup><sup>1</sup>Andrews University, Berrien Springs, MI**PS-7B-6-35** Recharging Implanted Electronics With an Electric FieldT. JOCHUM<sup>1</sup>, Z. ABZUG<sup>1</sup>, AND P. WOLF<sup>1</sup><sup>1</sup>Duke University, Durham, NC**PS-7B-6-36** Imaging Analysis of Carbohydrate Microarray: ToF-SIMS, SPRi and Multivariate AnalysisF. CHENG<sup>1</sup>, K. BOLLES<sup>2</sup>, AND D. M. RATNER<sup>1</sup><sup>1</sup>University of Washington, Seattle, WA, <sup>2</sup>Whitman College, Walla Walla, WA**PS-7B-6-37** DNA Dehybridization PhotolithographyS. B. RAJEWALE<sup>1</sup>, L. HUANG<sup>1</sup>, S-W. TAM-CHANG<sup>1</sup>, AND N. G. PUBLICOVER<sup>1</sup><sup>1</sup>University of Nevada-Reno, Reno, NV**PS-7B-6-38** Oxygen Sensitive MicrowellsE. SINKALA<sup>1</sup>, AND D. T. EDDINGTON<sup>1</sup><sup>1</sup>University of Illinois at Chicago, Chicago, IL**PS-7B-6-39** TNF Capture Dynamics within Hemoadsorption Beads Used to Treat SepsisJ. KIMMEL<sup>1,2</sup>, C. LACKO<sup>3</sup>, R. DELUDE<sup>1</sup>, AND W. FEDERSPIEL<sup>1,2</sup><sup>1</sup>University of Pittsburgh, Pittsburgh, PA, <sup>2</sup>McGowan Institute for Regenerative Medicine, Pittsburgh, PA, <sup>3</sup>Carnegie Mellon University, Pittsburgh, PA**PS-7B-6-40** Simulation of Label-free Biosensors With a Photonic Crystal Open CavityS. XIAO<sup>1</sup>, S. HUSSAIN<sup>1</sup>, R. PETERSON<sup>1</sup>, AND J. YE<sup>1</sup><sup>1</sup>UTSA, San Antonio, TX**PS-7B-6-41** Photonic Crystal Biosensor Label-Free Imaging to Screen for Natural Products that are Cytotoxic to Pancreatic Cancer CellsS. GEORGE<sup>1</sup><sup>1</sup>University of Illinois at Urbana Champaign, Urbana, IL**PS-7B-6-42** Label-Free Prehybridization Imaging of Printed DNA Microarrays for Spot Quality AnalysisS. GEORGE<sup>1</sup><sup>1</sup>University of Illinois at Urbana Champaign, Urbana, IL**PS-7B-6-43** Development of a Food Quality Monitor Based on Miniature Flexible pH SensorsW-D. HUANG<sup>1</sup>, S. DEB<sup>1</sup>, Y. SEO<sup>1</sup>, AND J-C. CHIAO<sup>1</sup><sup>1</sup>University of Texas at Arlington, Arlington, TX**PS-7B-6-44** An Integrated Circuit for Wireless Load-Modulation TranspondersY-S. SEO<sup>1</sup>, W-D. HUANG<sup>1</sup>, AND J-C. CHIAO<sup>1</sup><sup>1</sup>University of Texas at Arlington, Arlington, TX**PS-7B-6-45** Novel Double Lumen Catheter for Delivery of Materials at the Tissue-implant InterfaceA. PERAMO<sup>1</sup>, AND C. MARCELO<sup>1</sup><sup>1</sup>University of Michigan, Ann Arbor, MI**PS-7B-6-46** Conducting Polymer Devices for Control of Cell AdhesionA. M. WAN<sup>1</sup>, E. ISMAILOVA<sup>2</sup>, D. J. BROOKS<sup>1</sup>, C. K. OBER<sup>1</sup>, D. GOURDON<sup>1</sup>, C. FISCHBACH<sup>1</sup>, AND G. G. MALLIARAS<sup>1,2</sup><sup>1</sup>Cornell University, Ithaca, NY, <sup>2</sup>Ecole Nationale Supérieure des Mines de Saint-Etienne, Gardanne, France**PS-7B-6-47** Single-Biomolecule Detection using Polymer-based Photonic Crystal BiosensorsB. HAMZA<sup>1</sup>, Y. LIU<sup>1</sup>, AND J. DAWSON<sup>1</sup><sup>1</sup>West Virginia University, Morgantown, WV**PS-7B-6-48** Influence of Recognition Element Conformation and Conjugation Parameters on FET Protein SensorsT. R. NICHOLSON III<sup>1,2</sup>, S. K. GUPTA<sup>1,2</sup>, P. CASAL<sup>1,2</sup>, X. WEN<sup>1</sup>, H-H. WU<sup>1</sup>, W. LU<sup>1</sup>, L. BRILLSON<sup>1</sup>, AND S. C. LEE<sup>1,2</sup><sup>1</sup>The Ohio State University, Columbus, OH, <sup>2</sup>Dorothy Davis Heart and Lung Institute, Columbus, OH

**PS-7B-6-49** Detection of Picomolar Levels of Protein Analyte in Physiologic Buffer Using a Planar BioFETS. K. GUPTA<sup>1</sup>, X. WEN<sup>1</sup>, P. CASAL<sup>1</sup>, M. PALACIO<sup>1</sup>, H. H. WU<sup>1</sup>, W. LU<sup>1</sup>, L. BRILLSON<sup>1</sup>, B. BHUSHAN<sup>1</sup>, AND S. C. LEE<sup>1</sup><sup>1</sup>The Ohio State University, Columbus, OH**PS-7B-6-50** Receptor Conjugation Strategies and FET Protein Sensor PerformanceP. CASAL<sup>1</sup>, S. K. GUPTA<sup>1</sup>, T. R. NICHOLSON III<sup>1</sup>, X. R. WEN<sup>1</sup>, M. L. PALACIO<sup>1</sup>, H. H. WU<sup>1</sup>, W. L. LU<sup>1</sup>, B. L. BHUSHAN<sup>1</sup>, L. J. BRILLSON<sup>1</sup>, AND S. C. LEE<sup>1</sup><sup>1</sup>Ohio State University, Columbus, OH**PS-7B-6-51** Tuning Adhesion Failure Strength For Tissue-Specific ApplicationsN. ARTZI<sup>1,2</sup>, A. ZEIGER<sup>1</sup>, F. BOEHNING<sup>3</sup>, A. B. RAMOS<sup>1,4</sup>, K. V. VLIET<sup>1</sup>, AND E. EDELMAN<sup>1,2</sup><sup>1</sup>MIT, Cambridge, MA, <sup>2</sup>Brigham and Women Hospital, Harvard Medical School, Boston, MA, <sup>3</sup>MIT, Concord, MA, <sup>4</sup>Institut Quimic de Sarria, Barcelona, Spain, Spain**PS-7B-6-52** Design of a Tissue Implantable Lactate Sensor for Continuous *In Vivo* MonitoringD. A. BAKER<sup>1</sup><sup>1</sup>University of California, San Diego, La Jolla, CA**PS-7B-6-53** Interferometric Imaging Biosensor for Single Pathogen DetectionG. DAABOUL<sup>1</sup><sup>1</sup>Boston University, Boston, MA**PS-7B-6-54** A Novel Sensor for Continuous Glucose MonitoringJ. V. VEETIL<sup>1</sup>, S. JIN<sup>1</sup>, AND K. YE<sup>1</sup><sup>1</sup>University of Arkansas, Fayetteville, AR**PS-7B-6-55** Encapsulation of a Con-A/Glycodendrimer Glucose Sensing Assay using Microporated Hydrogel SpheresB. M. CUMMINS<sup>1</sup>, M. PISHKO<sup>1</sup>, E. SIMANEK<sup>1</sup>, AND G. COTÉ<sup>1</sup><sup>1</sup>Texas A&M University, College Station, TX**PS-7B-6-56** Electrokinetic Sample Preparation for Electrochemical Assays: Towards Point-Of-Care Diagnosis of Urinary Tract InfectionsL. M. SIN<sup>1</sup>, V. GAU<sup>2</sup>, J. LIAO<sup>3</sup>, AND P. WONG<sup>1</sup><sup>1</sup>University of Arizona, Tucson, AZ, <sup>2</sup>GeneFluidics Inc, Monterey Park, CA, <sup>3</sup>University of Stanford, Palo Alto, CA**PS-7B-6-57** Effect of Protein-Affinity Ligands in Molecular Imprinting of Proteins in Thin Films of HydrogelA. AVALOS<sup>1</sup>, AND A. NADARAJAH<sup>1</sup><sup>1</sup>University of Toledo, Toledo, OH**PS-7B-6-58** Measuring Dynamic Properties of Round Window Membrane by Electromagnetic Force StimulationD. NAKMALI<sup>1</sup>, X. ZHANG<sup>1</sup>, AND R. Z. GAN<sup>1</sup><sup>1</sup>University of Oklahoma, Norman, OK**PS-7B-6-59** Shape Memory Polymers with Silicon-Containing SegmentsD. ZHANG<sup>1</sup>, S. L. PRUKOP<sup>1</sup>, M. L. GIESE<sup>1</sup>, AND M. A. GRUNLAN<sup>1</sup><sup>1</sup>Texas A&M University, College Station, TX**PS-7B-6-60** Impedimetric Characterization of Biomimetic Hydrogels Coated on Interdigitated Microsensor Electrode Arrays (IMEs)L. YANG<sup>1</sup>, A. GUISEPPi-WILSON<sup>2</sup>, AND A. GUISEPPi-ELIE<sup>3</sup><sup>1</sup>North Carolina Central University, Durham, NC, <sup>2</sup>ABTECH Scientific, Inc., Richmond, VA, <sup>3</sup>Clemson University, Clemson, SC**PS-7B-6-61** Optical Biosensor based on Protein à “ Nanoparticle Composite BiomaterialsR. MAJITHIA<sup>1</sup>, J. A. JAMISON<sup>2</sup>, J. PATTERSON<sup>2</sup>, S. E. BONDOS<sup>2</sup>, AND K. E. MEISSNER<sup>1</sup><sup>1</sup>Texas A&M University, College Station, TX, <sup>2</sup>Texas A&M Health Science Center, College Station, TX**PS-7B-6-62** Compact Interferometric Reflectance Imaging BiosensorA. REDDINGTON<sup>1</sup>, AND R. VEDULA<sup>2</sup><sup>1</sup>Boston University, Boston, MA, <sup>2</sup>Tuffs University, Boston, MA**PS-7B-6-63** Multicolor Microcontact Printing of Proteins on Porous Silica for Patterned ImmunoassayE. NG<sup>1</sup>, E. BLINKA<sup>1</sup>, K. LOEFFLER<sup>1</sup>, Y. HU<sup>1</sup>, A. GOPAL<sup>1</sup>, K. HOSHINO<sup>1</sup>, X. LIU<sup>2</sup>, M. FERRARI<sup>2</sup>, AND X. ZHANG<sup>1</sup><sup>1</sup>University of Texas at Austin, Austin, TX, <sup>2</sup>University Health Science Center, Houston, TX**PS-7B-6-64** A Phantom That Mimics Optical and Flow Properties of Liver for Developing a Perfusion SensorT. J. KING<sup>1</sup>, T. J. AKL<sup>1</sup>, R. LONG<sup>1</sup>, M. J. MCSHANE<sup>1</sup>, M. N. ERICSON<sup>2</sup>, M. WILSON<sup>3,4</sup>, AND G. L. COTÉ<sup>1</sup><sup>1</sup>Texas A&M University, College Station, TX, <sup>2</sup>Oak Ridge National Laboratory, Oak Ridge, TN, <sup>3</sup>University of Pittsburgh, Pittsburgh, PA, <sup>4</sup>VA Pittsburgh Healthcare System, Pittsburgh, PA**PS-7B-6-65** Photonic Polymers for Chemical and Biological SensingO. B. AYYUB<sup>1</sup>, J. SEKOWSKI<sup>2</sup>, AND P. KOFINAS<sup>1</sup><sup>1</sup>University of Maryland, College Park, MD, <sup>2</sup>US Army Edgewood Chemical Biological Center, Aberdeen Proving Ground, MD**PS-7B-6-66** Effects of Nanoscale Topography and Charge on Endothelial Cell Spreading and ProliferationJ. S. SILVERSTEIN<sup>1</sup>, E. PARYAVI<sup>1</sup>, H. ARANDA-ESPINOZA<sup>1</sup>, B. J. DAIR<sup>2</sup>, AND P. KOFINAS<sup>1</sup><sup>1</sup>University of Maryland, College Park, MD, <sup>2</sup>Food and Drug Administration, Silver Spring, MD**PS-7B-6-67** Miniature Biosensor for Detecting Hydrogen Peroxide Release from a Small Cell PopulationJ. YAN<sup>1</sup>, V. PERDOSAZ<sup>2</sup>, J. ENOMOTO<sup>1</sup>, A. SIMONIAN<sup>2</sup>, AND A. REVZIN<sup>1</sup><sup>1</sup>University of California, Davis, Davis, CA, <sup>2</sup>Auburn University, Auburn, AL**PS-7B-6-68** Response and Stability Optimization of Microsphere Glucose Sensors Utilizing Catalase and NanofilmsB. COLLIER<sup>1</sup>, AND M. J. MCSHANE<sup>1</sup><sup>1</sup>Texas A&M University, College Station, TX**PS-7B-6-69** Activity of Layer-by-Layer Immobilized Glutamate OxidaseS. M. TANGUTOORU<sup>1</sup>, V. L. KOPPARTHY<sup>1</sup>, H. T. ALSHAKHOURI<sup>1</sup>, M. A. DECOSTER<sup>1</sup>, AND E. J. GUILBEAU<sup>1</sup><sup>1</sup>Louisiana Tech University, Ruston, LA**PS-7B-6-70** Microfluidic Devices to Monitor Single Cardiac Physiology Under Hypoxic ConditionsI. A. GES<sup>1</sup>, AND F. BAUDENBACHER<sup>1</sup><sup>1</sup>Vanderbilt University, Nashville, TN**PS-7B-6-71** Optimizing Protein Recognitive Hydrogel Systems for Biosensor ApplicationsD. KRYSIO<sup>1</sup>, AND N. PEPPAS<sup>1</sup><sup>1</sup>The University of Texas at Austin, Austin, TX**PS-7B-6-72** A Novel Cancer Therapeutic Device for Circulating Tumor Cell Elimination From BloodM. ZHOU<sup>1</sup>, R. HAROUAKA<sup>1</sup>, AND S. ZHENG<sup>1</sup><sup>1</sup>Pennsylvania State University, University Park, PA**Track: Drug Delivery Systems – PS-7B-7****Targeted Drug Delivery****PS-7B-7-73** Design And *In Vitro* Performance Of A Novel Theranostic SystemS. SRINIVASAN<sup>1</sup>, B. G. VILENTCHOUK<sup>1</sup>, W. DRIESSEN<sup>2</sup>, B. PRONETH<sup>2</sup>, P. DECUZZI<sup>3</sup>, W. ARAP<sup>2</sup>, R. PASQUALINI<sup>2</sup>, AND M. FERRARI<sup>1</sup><sup>1</sup>University of Texas at Houston, Houston, TX, <sup>2</sup>MD Anderson Cancer Center, Houston, TX, <sup>3</sup>University of Magna Graecia Viale Europa - LOC, Germaneto Catanzaro, Italy**PS-7B-7-74** Bioimpedance Tuning Electroporation for Optimizing Targeted Intradermal DNA DeliveryJ. MEDRANO<sup>1</sup>, R. CONNOLLY<sup>1</sup>, J. I. REY<sup>1</sup>, A. ANDERSON<sup>1</sup>, R. GITLIN<sup>1</sup>, AND M. JAROSZESKI<sup>1</sup><sup>1</sup>University of South Florida, Tampa, FL

**PS-7B-7-75** EphrinA1-conjugated Liposomes for Targeted Delivery of Chemotherapeutic Agents to Glioblastoma CellsH. CHO<sup>1</sup>, W. LEE<sup>1</sup>, J. M. SAUL<sup>2</sup>, AND Y. W. LEE<sup>1</sup><sup>1</sup>Virginia Tech-Wake Forest University, Blacksburg, VA, <sup>2</sup>Virginia Tech-Wake Forest University, Winston-Salem, NC**PS-7B-7-76** Swellable Microparticles for Sustained Release Drug Delivery to The Lung Using Propellant Driven Metered Dose InhalersP. SELVAM<sup>1</sup>, I. M. EL-SHERBINY<sup>1</sup>, AND H. D. SMYTH<sup>1</sup><sup>1</sup>University of Texas at Austin, Austin, TX**PS-7B-7-77** Logic-Embedded Vectors for Intracellular Partitioning and Exocytosis of NanoparticlesR. E. SERDA<sup>1</sup>, A. MACK<sup>1</sup>, A. VAN DE VEN<sup>1</sup>, S. FERRATI<sup>1</sup>, B. GODIN<sup>1</sup>, AND M. FERRARI<sup>1,2</sup><sup>1</sup>UTHSC, Houston, TX, <sup>2</sup>MD Anderson Cancer Center, Houston, TX**PS-7B-7-78** Multi-functional Hydrogel Nanocomposite for Drug Delivery ApplicationsA. QURESHI<sup>1</sup>, AND D. HAYES<sup>1</sup><sup>1</sup>Louisiana State University and LSU Agricultural Center, Baton Rouge, LA**PS-7B-7-79** Integrated and Multiplexed Fabrication of Micro and Nano Biodegradable Particles Using a Novel Electrospray ProcessB. ALMERIA<sup>1</sup>, T. M. FAHMY<sup>1</sup>, AND A. GOMEZ<sup>1</sup><sup>1</sup>Yale University, New Haven, CT**PS-7B-7-80** N-acetylgalactosamine Functionalized Dendrimers as Liver-Targeted Drug CarriersS. H. MEDINA<sup>1</sup>, V. TEKUMALLA<sup>1</sup>, M. CHEVLIKOV<sup>1</sup>, D. S. SHEWACH<sup>1</sup>, W. D. ENSMINGER<sup>1</sup>, AND M. E. EL-SAYED<sup>1</sup><sup>1</sup>University of Michigan, Ann Arbor, MI**PS-7B-7-81** Use of the Angular Spectrum Approach for Estimating the 3-D Acoustic Field Transmitted Through SkullJ. L. RAYMOND<sup>1</sup>, S. M. CHRZANOWSKI<sup>1</sup>, C. K. HOLLAND<sup>1</sup>, AND G. J. SHAW<sup>1</sup><sup>1</sup>University of Cincinnati, Cincinnati, OH**PS-7B-7-82** Uptake and Clearance of Spherical Gold Nanoparticles in 3D Liver MimicsC. J. DETZEL<sup>1</sup>, AND P. RAJAGOPALAN<sup>1</sup><sup>1</sup>Virginia Polytechnic Institute and State University, Blacksburg, VA**PS-7B-7-83** Molecular Probes for Visualization of HIV Protease InhibitionH. YAO<sup>1</sup>, J. V. VELICHAMTHOTU<sup>1</sup>, K. YE<sup>1</sup>, AND S. JIN<sup>1</sup><sup>1</sup>University of Arkansas, Fayetteville, AR**PS-7B-7-84** Effect of Formulation Factors on Chitosan Particle PropertiesB. KOPPOLU<sup>1</sup>, AND D. A. ZAHAROFF<sup>1</sup><sup>1</sup>University of Arkansas, Fayetteville, AR**PS-7B-7-85** Significance of Electrostatic Properties of M cells with Respect to Microparticle UptakeP. JREU<sup>1</sup>, T. RAJAPAKSA<sup>1</sup>, D. LO<sup>1</sup>, AND V. G. J. RODGERS<sup>1</sup><sup>1</sup>University of California, Riverside, CA**PS-7B-7-86** Theranostic Nanoparticles for Cancer Diagnosis and TreatmentA. WADAJKAR<sup>1,2</sup>, P. RAJAN<sup>1,2</sup>, Z. BHAVSAR<sup>1,2</sup>, B. KOPPOLU<sup>1,2</sup>, Y. ZHANG<sup>1,2</sup>, W. CUI<sup>2</sup>, L. TANG<sup>1,2</sup>, J. YANG<sup>1,2</sup>, AND K. T. NGUYEN<sup>1,2</sup><sup>1</sup>UT Arlington, Arlington, TX, <sup>2</sup>UT Southwestern Medical Center, Dallas, TX**PS-7B-7-87** Electrostatic Contribution of Poly (Lactic-co-Glycolic) Acid Nanoparticles for Immunization of the Mucosal SystemK. M. BENNETT<sup>1</sup>, T. E. RAJAPAKSA<sup>1</sup>, V. G. RODGERS<sup>1</sup>, AND D. D. LO<sup>1</sup><sup>1</sup>University of California Riverside, Riverside, CA**PS-7B-7-88** Triggering Drug Release from Temperature Sensitive Liposomes via Photothermal Heating of Hollow Gold NanoshellsN. FORBES<sup>1</sup>, AND J. ZASADZINSKI<sup>1</sup><sup>1</sup>University of California, Santa Barbara, Santa Barbara, CA**PS-7B-7-89** Targeted Therapeutic Gene Delivery by Sonoporation in Inflammatory Bowel DiseaseJ. L. TLAXCA<sup>1</sup>, C. R. ANDERSON<sup>2</sup>, J. J. RYCHAK<sup>2</sup>, A. L. KLIBANOV<sup>1</sup>, AND M. B. LAWRENCE<sup>1</sup><sup>1</sup>University of Virginia, Charlottesville, VA, <sup>2</sup>Targeson, Inc, San Diego, CA**PS-7B-7-90** Infusion-Pressure Transducer System to Determine Hydraulic Conductivity in Soft TissuesT. NOBREGA<sup>1</sup>, J. H. KIM<sup>1</sup>, AND M. SARNTINORANONT<sup>1</sup><sup>1</sup>University of Florida, Gainesville, FL**PS-7B-7-91** Effect of Plasticizers on the Properties of Drug Delivery FilmsC. L. RABEK<sup>1</sup>, D. PULEO<sup>1</sup>, AND T. DZIUBLA<sup>1</sup><sup>1</sup>UNIVERSITY OF KENTUCKY, LEXINGTON, KY**PS-7B-7-92** In Situ Composite Hydrogel System for Treatment of Complex WoundsN. V. APHALE<sup>1,2</sup>, H. XU<sup>1,2</sup>, D. GYAWALI<sup>1,2</sup>, A. WADAJKAR<sup>1,2</sup>, L. TANG<sup>1,2</sup>, J. YANG<sup>1,2</sup>, AND K. NGUYEN<sup>1,2</sup><sup>1</sup>University of Texas at Arlington, Arlington, TX, <sup>2</sup>University of Texas Southwestern Medical Center, Dallas, TX**PS-7B-7-93** Aptamer-Functionalized Biomaterials for Pulsatile Proteins ReleaseB. SOONTORNWORAJIT<sup>1</sup>, J. ZHOU<sup>1</sup>, AND Y. WANG<sup>1</sup><sup>1</sup>University of Connecticut, Storrs, CT**PS-7B-7-94** Size-dependent Biodistribution and Retention of Nanoparticles After Intravenous Administration in MiceW-Y. LIAO<sup>1</sup>, C-W. TANG<sup>1</sup>, A. TANG<sup>1</sup>, M-Y. CHANG<sup>2</sup>, AND P. HSIEH<sup>2</sup><sup>1</sup>Institute of Clinical Medicine & Research Center of Clinical Medicine, Tainan, Taiwan, Tainan, Taiwan, Taiwan, <sup>2</sup>Institute of Biomedical Engineering, National Cheng Kung University, Tainan, Taiwan, Tainan, Taiwan, Taiwan**PS-7B-7-95** Photochemical Sensitization of Liposomes for Controlled Drug ReleaseR. T. KOZIKOWSKI<sup>1</sup>, B. WEBER<sup>1</sup>, G. HOCHHAUS<sup>1</sup>, AND B. S. SORG<sup>1</sup><sup>1</sup>University of Florida, Gainesville, FL**PS-7B-7-96** Vascular Targeting of Multistage VectorsA. MACK<sup>1</sup>, S. FERRATI<sup>1</sup>, M. FERRARI<sup>1,2</sup>, AND R. SERDA<sup>1</sup><sup>1</sup>University of Texas Health Science Center, Houston, TX, <sup>2</sup>Rice University, Houston, TX**PS-7B-7-97** Cylindrical Micelles Targeted to B-cell LymphomasB. HARRIS<sup>1</sup>, AND P. DALHAIMER<sup>1</sup><sup>1</sup>Univ. of Tennessee, Knoxville, TN**PS-7B-7-98** Dynamic Docking Method in Virtual ScreeningT. YANG<sup>1</sup><sup>1</sup>The University of Texas at Austin, Austin, TX**PS-7B-7-99** Magnetic Multilayer Nanoparticles for Targeted and Controlled Drug Delivery and Skin Cancer ImagingZ. BHAVSAR<sup>1,2</sup>, B. KOPPOLU<sup>1,2</sup>, A. WADAJKAR<sup>1,2</sup>, W. CUI<sup>2</sup>, AND K. T. NGUYEN<sup>1,2</sup><sup>1</sup>UT Arlington, Arlington, TX, <sup>2</sup>UT Southwestern Medical Center, Dallas, TX**PS-7B-7-100** Virus-Inspired Design Principles of Nanoparticles as Therapeutic AgentsS. ZHANG<sup>1</sup>, H. YUAN<sup>1</sup>, J. LI<sup>2</sup>, AND G. BAO<sup>3</sup><sup>1</sup>Penn State University, University Park, PA, <sup>2</sup>Univ. Pennsylvania, Philadelphia, PA, <sup>3</sup>Georgia Tech, Atlanta, GA**PS-7B-7-101** Microsphere-based Delivery of Betamethasone to Differentiating Human Mesenchymal Stem CellsT. RICHEY<sup>1</sup>, M. SMITH<sup>1</sup>, B. THANOO<sup>1</sup>, K. J. PENICK<sup>2</sup>, AND J. F. WELTER<sup>2</sup><sup>1</sup>Oakwood Laboratories, Oakwood, OH, <sup>2</sup>Case Western Reserve University, Cleveland, OH**PS-7B-7-102** Cylinders vs. Spheres: Biofluid Shear Thinning in Driven Nanoparticle TransportJ. A. CRIBB<sup>1</sup>, T. MEEHAN<sup>2</sup>, S. M. SHAH<sup>3</sup>, K. SKINNER<sup>1</sup>, AND R. SUPERFINE<sup>1</sup><sup>1</sup>UNC - Chapel Hill, Chapel Hill, NC, <sup>2</sup>University of Queensland, St. Lucia, QLD, Australia, <sup>3</sup>University of Cambridge, Cambridge, England, United KingdomPS = Poster Session  
OP = Oral Presentation

**PS-7B-7-103** Ultrasound-enabled Non-invasive Transdermal Transport of Liposomes as Drug Delivery VehiclesA. NGUYEN<sup>1</sup>, Y. SUNNY<sup>1</sup>, E. PAPAZOGLU<sup>1</sup>, AND P. LEWIN<sup>1</sup><sup>1</sup>Drexel University, Philadelphia, PA**PS-7B-7-104** Potency Enhancement of gp120-targeted HIV-1 Entry Inhibitors Conjugated to Gold Nanoparticles.A. ROSEMARY BASTIAN<sup>1</sup>, R. K. SUNDARAM<sup>1</sup>, S. RAJAGOPAL<sup>1</sup>, K. MCFADDEN<sup>1</sup>, K. KANTHARAJU<sup>1</sup>, E. PAPAZOGLU<sup>1</sup>, AND I. CHAIKEN<sup>1</sup><sup>1</sup>Drexel University, Philadelphia, PA**PS-7B-7-105** Antibody Presentation Localized to Lipid Microdomains for Enhanced Liposome Binding to EndotheliumD. ALMEDA<sup>1</sup>, AND D. T. AUGUSTE<sup>1</sup><sup>1</sup>Harvard University, Cambridge, MA**PS-7B-7-106** Stealth-Targeted Liposomes for Invasive Mould InfectionsN. L. CHAVAN<sup>1</sup><sup>1</sup>University of Houston, Houston, TX**PS-7B-7-107** Characterization of Nanoparticle Targeted Delivery in MicrocirculationY. LIU<sup>1</sup>, J. TAN<sup>1</sup>, AND K. NGUYEN<sup>1</sup><sup>1</sup>University of Texas at Arlington, Arlington, TX**Track: Drug Delivery Systems – PS-7B-8****Translation Drug Delivery and Clinical Trials****PS-7B-8-108** Deep Sequencing Analysis of Clinical HIV SamplesS. M. WILLERTH<sup>1</sup>, H. PEDRO<sup>1</sup>, A. P. ARKIN<sup>1</sup>, AND D. V. SCHAFER<sup>1</sup><sup>1</sup>University of California-Berkeley, Berkeley, CA**PS-7B-8-109** Improving Ethacrynic Acid Delivery Based on Cellular Pharmacokinetic and Pharmacodynamic AnalysesF. YUAN<sup>1</sup>, AND C-W. LIN<sup>1</sup><sup>1</sup>Duke University, Durham, NC**PS-7B-8-110** Development of Microspheres for Controlled Release of Thymosin -4 in the Ischemic MyocardiumJ. E. THATCHER<sup>1</sup>, K. NGUYEN<sup>2</sup>, Z. SCHELLY<sup>2</sup>, I. BOCK-MARQUETTE<sup>1</sup>, R. EBERHART<sup>1</sup>, AND J. M. DIMAIO<sup>1</sup><sup>1</sup>UT Southwestern Medical Center, Dallas, TX, <sup>2</sup>University of Texas at Arlington, Arlington, TX**PS-7B-8-111** Cell Type Specific Nano-ToxicologyS. FERRATI<sup>1</sup>, A. MACK<sup>1</sup>, M. FERRARI<sup>1,2</sup>, AND R. SERDA<sup>1</sup><sup>1</sup>University of Texas Health Science Center, Houston, TX, <sup>2</sup>Rice University, Houston, TX**PS-7B-8-112** Confinement and Concentration Effects on Glucose Transport in NanochannelsA. ZIEMYS<sup>1</sup>, A. GRATTONI<sup>1</sup>, D. FINE<sup>1</sup>, F. HUSSAIN<sup>2</sup>, AND M. FERRARI<sup>1,3</sup><sup>1</sup>The University of Texas Health Science Center - Houston, Houston, TX, <sup>2</sup>University of Houston, Houston, TX, <sup>3</sup>The University of Texas M. D. Anderson Cancer Center, Houston, TX**Track: Neural Engineering – PS-7B-9****Sensory Neural Prosthetics****PS-7B-9-113** Afferent Stimulation of Sacral Dermatomes Suppresses Urethral Reflexes After Chronic SCIJ. L. MCCOIN<sup>1,2</sup>, N. BHADRA<sup>1,2</sup>, AND K. J. GUSTAFSON<sup>1,2</sup><sup>1</sup>Case Western Reserve University, Cleveland, OH, <sup>2</sup>Louis Stokes VA Medical Center, Cleveland, OH**PS-7B-9-114** High Frequency Electric Stimulation of Retinal Neurons Elicits Physiological Signaling PatternsS. FRIED<sup>1,2</sup>, C. CAI<sup>1,3</sup>, J. RIZZO<sup>1,4</sup>, AND Q. REN<sup>3</sup><sup>1</sup>Boston VA Healthcare System, Boston, MA, <sup>2</sup>Mass General Hospital / Harvard Medical School, Boston, MA, <sup>3</sup>Shanghai Jiao-Tong University, Shanghai, Shanghai, China, People's Republic of, <sup>4</sup>Mass. Eye and Ear Infirmary, Boston, MA**PS-7B-9-115** Selective Activation of Retinal Neurons with Sinusoidal Electric StimulationD. K. FREEMAN<sup>1,2</sup>, J. F. RIZZO III<sup>1,3</sup>, AND S. I. FRIED<sup>1,2</sup><sup>1</sup>Boston VA Healthcare System, Boston, MA, <sup>2</sup>Massachusetts General Hospital, Harvard Medical School, Boston, MA, <sup>3</sup>Massachusetts Eye and Ear Infirmary, Harvard Medical School, Boston, MA**PS-7B-9-116** Three-Dimensional 160-Site Microelectrode Array for Cochlear Nucleus Mapping StudiesSR. M-E. MERRIAM<sup>1</sup>, S. DEHMEL<sup>1</sup>, O. SRIVANNAVIT<sup>1</sup>, S. E. SHORE<sup>1</sup>, AND K. D. WISE<sup>1</sup><sup>1</sup>University of Michigan, Ann Arbor, MI**PS-7B-9-117** Ultra-High Photosensitivity Vertical Nanowire Arrays for Retinal ProsthesisM. L. KHRAICHE<sup>1</sup>, G. SILVA<sup>1</sup>, G. CAUWENBERGHS<sup>1</sup>, D. WANG<sup>1</sup>, Y. LO<sup>1</sup>, AND W. FREEMAN<sup>2</sup><sup>1</sup>UCSD, San Diego, CA, <sup>2</sup>Jacobs Retina Center, San Diego, CA**PS-7B-9-118** Two Classes of Action Potentials are Initiated by Electric Stimulation of Retinal Ganglion CellsC. CAI<sup>1,2</sup>, Q. REN<sup>2</sup>, AND S. FRIED<sup>1,3</sup><sup>1</sup>Mass General Hospital / Harvard Medical School, Boston, MA, <sup>2</sup>Shanghai Jiao-Tong University, Shanghai, Shanghai, China, People's Republic of, <sup>3</sup>Boston VA Healthcare System, Jamaica Plain, MA**PS-7B-9-119** Activation of Inner-Ear Hair Cells and Afferent Neurons by Pulsed Infrared RadiationS. M. RAJGURU<sup>1</sup>, G. M. DITTA<sup>2</sup>, R. D. RABBITT<sup>2,3</sup>, C-P. RICHTER<sup>1,4</sup>, AND S. M. HIGHSTEIN<sup>3</sup><sup>1</sup>Northwestern University, Chicago, IL, <sup>2</sup>University of Utah, Salt Lake City, UT, <sup>3</sup>Marine Biological Laboratory, Woods Hole, MA, <sup>4</sup>Northwestern University, Evanston, IL**PS-7B-9-120** Effects of Stimulus Pulse Parameters on Eye Movement Responses to Stimulation Delivered by a Vestibular ProsthesisN. S. DAVIDOVICS<sup>1</sup>, G. Y. FRIDMAN<sup>2</sup>, B. S. CHIANG<sup>1</sup>, AND C. DELLA SANTINA<sup>1</sup><sup>1</sup>Johns Hopkins University, Baltimore, MD, <sup>2</sup>Johns Hopkins University, Pikesville, MD**Track: Neural Engineering – PS-7B-10****Translational Neural Engineering****PS-7B-10-121** Electromagnetic Interference on Intraoperative Neurophysiological Monitoring SignalsA. FARAJIDAVAR<sup>1</sup>, J. SEIFERT<sup>1</sup>, J. STEARNS<sup>1</sup>, M. ROMERO<sup>1</sup>, AND J-C. CHIAO<sup>1</sup><sup>1</sup>The University of Texas at Arlington, Arlington, TX**Track: New Frontiers in Bioengineering – PS-7B-11****Cell and Subcellular Mechanics****PS-7B-11-122** Suppressing Non-specific Interactions Between Solid Surfaces Used for Single-molecule Force MeasurementsS. UPADHYAYULA<sup>1</sup>, S. BISHOP<sup>1</sup>, N. JOHNSON<sup>1</sup>, T. QUINATA<sup>1</sup>, P. NALLAGATLA<sup>1</sup>, S. GUPTA<sup>1</sup>, AND V. VULLEV<sup>1</sup><sup>1</sup>University of California, Riverside, Riverside, CA**PS-7B-11-123** Compression Instrument for Meso-Scale Tissue Experiments (CITE)D. W. EVANS<sup>1,2</sup>, AND J. L. SPARKS<sup>1,2</sup><sup>1</sup>Virginia Tech - Wake Forest Center for Injury Biomechanics, Winston Salem, NC, <sup>2</sup>Virginia Tech - Wake Forest University School of Biomedical Engineering and Sciences, Winston Salem, NC

**PS-7B-11-124** Microparticle Motion Control by Microbeam Ultrasound: A Potential Single Cell ManipulatorJ. LEE<sup>1</sup>, S.-Y. TEH<sup>2</sup>, A. LEE<sup>2</sup>, H. KIM<sup>1</sup>, C. LEE<sup>1</sup>, AND K. K. SHUNG<sup>1</sup><sup>1</sup>University of Southern California, Los Angeles, CA, <sup>2</sup>University of California at Irvine, Irvine, CA**PS-7B-11-125** The Stress-State and Strain-Rate Dependency of Human Placenta TissueB. WEED<sup>1</sup>, A. BORAZJANI<sup>1</sup>, S. PATNAIK<sup>1</sup>, R. PRABHU<sup>1</sup>, M. HORSTEMEYER<sup>1</sup>, L. WILLIAMS<sup>1</sup>, AND J. LIAO<sup>1</sup><sup>1</sup>Mississippi State University, Mississippi State, MS**PS-7B-11-126** Exploring Cellular Mechanotransduction, One Molecule at a TimeM. R. MOFRAD<sup>1</sup><sup>1</sup>University of California, Berkeley, Berkeley, CA**PS-7B-11-127** Mechanical Modeling of Morphology and Morphogenetic Events in the Drosophila EyeS. HILGENFELDT<sup>1,2</sup>, I. M. GEMP<sup>2</sup>, AND R. A. CARTHEW<sup>2</sup><sup>1</sup>University of Illinois at Urbana-Champaign, Urbana, IL, <sup>2</sup>Northwestern University, Evanston, IL**PS-7B-11-128** Modeling the Coherent and Autonomous Biomechanical Behavior of Cells Using an Agent-Based ApproachN. I. MOLDOVAN<sup>1</sup><sup>1</sup>Davis Heart and Lung Research Institute, The Ohio State University, Columbus, OH**PS-7B-11-129** In Situ Force Mapping of Mammary Gland TransformationJ. I. LOPEZ<sup>1</sup>, AND V. WEAVER<sup>1</sup><sup>1</sup>UCSF, San Francisco, CA**PS-7B-11-130** Inhibition of Hsp90 for Enhanced In Vitro Photothermal Ablation of Cancer CellsS. K. SHIMP III<sup>1</sup>, J. WHITNEY<sup>1</sup>, B. WILL<sup>1</sup>, C. ZAWASKI<sup>1</sup>, AND M. N. RYLANDER<sup>1</sup><sup>1</sup>Virginia Tech, Blacksburg, VA**PS-7B-11-131** Probing Mechanisms of Mechano-sensitive Differentiation in Mesenchymal Stem CellsA. W. HOLLE<sup>1</sup>, N. S. JOSHI<sup>1</sup>, D. VIJAYRAGHAVAN<sup>1</sup>, AND A. J. ENGLER<sup>1</sup><sup>1</sup>UC San Diego, La Jolla, CA**PS-7B-11-132** Molecular Mechanics of Filamin: FLNA Repeats 16-17 Response to Applied ForceH. PEZESHKI<sup>1</sup>, AND M. R. MOFRAD<sup>1</sup><sup>1</sup>University of California, Berkeley, Berkeley, CA**PS-7B-11-133** Mechanosensitivity of Cardiac Cells and Its Implication on Myocardial InfarctionX. TANG<sup>1</sup>, P. BAJAJ<sup>1</sup>, R. BASHIR<sup>1</sup>, AND T. A. SAIF<sup>1</sup><sup>1</sup>University of Illinois at Urbana-Champaign, Urbana, IL**PS-7B-11-134** Lamins & Granulopoiesis – How Altered Nuclear Mechanics Can Improve Passage Through Narrow SpacesA. ROWAT<sup>1</sup>, D. E. JAALOUK<sup>2</sup>, D. A. WEITZ<sup>1</sup>, AND J. LAMMERDING<sup>2</sup><sup>1</sup>Harvard University, Cambridge, MA, <sup>2</sup>Brigham and Women's Hospital/Harvard Medical School, Cambridge, MA**Track: Orthopedic and Rehabilitation Engineering – PS-7B-12****Orthopaedic Bioengineering****PS-7B-12-135** Developing Active Ankle Foot Orthosis by Using SMA WiresM. BHADANE<sup>1</sup>, AND M. ELAHINIA<sup>1</sup><sup>1</sup>University of Toledo, Toledo, OH**PS-7B-12-136** Quantitative Analysis of an AFO Cut-Line Measurement TechniqueT. J. WARRICK<sup>1</sup>, S. BIELBY<sup>1</sup>, E. SKEWES<sup>2</sup>, R. BROOKS<sup>2</sup>, D. BENSON<sup>2</sup>, C. DUNNING<sup>1</sup>, AND J. D. DESJARDINS<sup>1</sup><sup>1</sup>Clemson University, Clemson, SC, <sup>2</sup>Shriners Hospital of Greenville SC, Greenville, SC**PS-7B-12-137** An FE Model for Stress Reduction at the Skin-Implant Interface of Osseointegrated ProsthesisS. YERNENI<sup>1,2</sup>, AND T. A. KUIKEN<sup>1,2</sup><sup>1</sup>Northwestern University, Evanston, IL, <sup>2</sup>Rehabilitation Institute of Chicago, Chicago, IL**PS-7B-12-138** Characterization of Goat Adipose and Bone Marrow Derived Stem Cells For Orthopaedic TherapiesD. B. NEIDRE<sup>1</sup>, A. SARATHY<sup>1</sup>, J. TREFF<sup>1</sup>, Z. GARZA<sup>2</sup>, A. NEIDRE<sup>3</sup>, J. POSER<sup>4</sup>, AND R. P. FARRAR<sup>1</sup><sup>1</sup>The University of Texas at Austin, Austin, TX, <sup>2</sup>The University of Texas Health Science Center at San Antonio, San Antonio, TX, <sup>3</sup>South Texas Orthopaedic and Spinal Surgery Associates, San Antonio, TX, <sup>4</sup>SpineSmith Partners LTD, Austin, TX**PS-7B-12-139** Shear-Plane Motion in Unicondylar Knee Replacements with Change to Simulated Soft-Tissue ConstraintJ. B. MATHENY<sup>1</sup>, B. L. ROACH<sup>1</sup>, M. SPINELLI<sup>1</sup>, AND J. D. DESJARDINS<sup>1</sup><sup>1</sup>Clemson University, Clemson, SC**PS-7B-12-140** Comparative Analysis of Retrieved Genesis II UHMWPE Articulating Against OxZr vs. CoCr Femoral ComponentsH. M. CASH<sup>1</sup>, E. ALVAREZ<sup>1</sup>, M. E. ELPERS<sup>1</sup>, M. E. WABLER<sup>1</sup>, F. R. VOSS<sup>2</sup>, AND J. D. DESJARDINS<sup>1</sup><sup>1</sup>Clemson University, Clemson, SC, <sup>2</sup>University of South Carolina, Columbia, SC**PS-7B-12-141** Analysis and Damage Characterization of PS Total Knee Joint Replacement PostsE. E. SLOAN<sup>1</sup>, E. ALVAREZ<sup>1</sup>, M. E. ELPERS<sup>1</sup>, H. M. CASH<sup>1</sup>, M. E. WABLER<sup>1</sup>, AND J. D. DESJARDINS<sup>1</sup><sup>1</sup>Clemson University, Clemson, SC**PS-7B-12-142** Modeling Variations in Varus-Valgus Laxity in the Healthy Knee JointB. MORSE<sup>1</sup>, C. CLARY<sup>2</sup>, A. J. CYR<sup>3</sup>, P. D. FUNKENBUSH<sup>1</sup>, L. MALETSKY<sup>3</sup>, AND A. L. LERNER<sup>1</sup><sup>1</sup>University of Rochester, Rochester, NY, <sup>2</sup>DePuy Orthopaedics, Warsaw, IN, <sup>3</sup>University of Kansas, Lawrence, KS**PS-7B-12-143** Cervical Endplates are Affected by Incomplete Length of Annular Fibers: A Finite AnalysisM. HUSSAIN<sup>1</sup>, R. E. GAY<sup>2</sup>, AND K-N. AN<sup>3</sup><sup>1</sup>Logan University, Chesterfield, MO, <sup>2</sup>Mayo Clinic, Rochester, MN, <sup>3</sup>Mayo Clinics, Rochester, MN**PS-7B-12-144** Inner Trabecular Bone is More Affected Than Outer Cortical Bone Due to Incomplete Annular FibersM. HUSSAIN<sup>1</sup>, R. E. GAY<sup>2</sup>, AND K-N. AN<sup>3</sup><sup>1</sup>Logan University, Chesterfield, MO, <sup>2</sup>Mayo Clinic, Rochester, MN, <sup>3</sup>Mayo Clinics, Rochester, MN**PS-7B-12-145** Evaluation of a Novel Battery-Powered Spinal InstrumentS. VADAPALLI<sup>1</sup>, S. SUMMY<sup>1</sup>, A. MAHAJAN<sup>2</sup>, D. WOODS<sup>1</sup>, J. BHARADWAJ<sup>1</sup>, B. STEELE<sup>1</sup>, AND E. SAHAGUN<sup>1</sup><sup>1</sup>Medtronic Spinal and Biologics, Memphis, TN, <sup>2</sup>The University of Akron, Akron, OH**PS-7B-12-146** A Thermal Model for Bone Drilling with Application to Orthopaedic SurgeryJ. LEE<sup>1</sup>, Y. RABIN<sup>1</sup>, AND B. OZDOGANLAR<sup>1</sup><sup>1</sup>Carnegie Mellon University, Pittsburgh, PA**PS-7B-12-147** Characterization of High Precision Experimental Model of Graded Bilateral Distraction Spinal InjuryM. ROMERO<sup>1</sup>, J. STEARNS<sup>1</sup>, B. ELMER<sup>1</sup>, J. SEIFERT<sup>1</sup>, AND D. SUCATO<sup>2</sup><sup>1</sup>University of Texas at Arlington, Arlington, TX, <sup>2</sup>Texas Scottish Rite Hospital for Children, Dallas, TX



## Track: Orthopedic and Rehabilitation Engineering – PS-7B-13

### Orthopaedic Biomaterials

#### PS-7B-13-148 Orthopedic Wear-debris-particulates Elicit a Size and Dose Dependent Response by RAW 264.7 Cells

S. SAHA<sup>1</sup>, AND M. MUSIB<sup>1</sup>

<sup>1</sup>SUNY Downstate Medical Center, Brooklyn, NY

#### PS-7B-13-149 Active Functional Scaffold for Bone Regeneration

D. S. OH<sup>1</sup>, J. SON<sup>1</sup>, C. BAE<sup>1,2</sup>, A. MARK<sup>1</sup>, AND S. CHOI<sup>1,3</sup>

<sup>1</sup>The University of Texas at San Antonio, San Antonio, TX, <sup>2</sup>Chonnam National University, Gwangju, Gwangju, Korea, Republic of, <sup>3</sup>Chungbuk National University, Cheongju, Chungbuk, Korea, Republic of

#### PS-7B-13-150 Damage Scoring and Surface Roughness Analysis to Assess Oxinium and Standard CoCr Femoral Component Scratching in Total Knee Replacements

M. E. WABLER<sup>1</sup>, E. ALVAREZ<sup>1</sup>, M. E. ELPERS<sup>1</sup>, H. M. CASH<sup>1</sup>, H. A. DEMOS<sup>2</sup>, H. D. SCHUTTE JR.<sup>2</sup>, AND J. D. DESJARDINS<sup>1</sup>

<sup>1</sup>Clemson University, Clemson, SC, <sup>2</sup>Medical University of South Carolina, Charleston, SC

#### PS-7B-13-151 The Incorporation of Organic Polymers Into Bone Cements Based on Glass Polyalkenoate Chemistry

M. R. TOWLER<sup>1</sup>, A. W. WREN<sup>1</sup>, A. COUGHLAN<sup>1</sup>, AND N. M. CUMMINS<sup>2</sup>

<sup>1</sup>Alfred University, Alfred, NY, <sup>2</sup>University of Limerick, Limerick, Limerick, Ireland

#### PS-7B-13-152 Microencapsulation of Cyanoacrylate for Development of Self-Healing Bone Cement

A. B. BROCHU<sup>1</sup>, AND W. M. REICHERT<sup>1</sup>

<sup>1</sup>Duke University, Durham, NC

#### PS-7B-13-153 Effects of Hydroxyapatite Coated Iron Oxide Nanoparticles on Osteoblast Functions

N. L. TRAN<sup>1</sup>, AND T. J. WEBSTER<sup>1</sup>

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

#### PS-7B-13-154 Mechanical Characterization of Polydimethylsiloxane for Microsystems Applications

J. MARTIN<sup>1</sup>, S. SRIPADA<sup>2</sup>, P. SETHU<sup>2</sup>, AND M. SAUNDERS<sup>1</sup>

<sup>1</sup>University of Kentucky, Lexington, KY, <sup>2</sup>University of Louisville, Louisville, KY

#### PS-7B-13-155 Comparative Analysis of Damage to Retrieved Femoral and Tibial NexGen PS Components

M. E. ELPERS<sup>1</sup>, E. ALVAREZ<sup>1</sup>, H. M. CASH<sup>1</sup>, M. E. WABLER<sup>1</sup>, B. BURNIKEL<sup>2</sup>, J. RODRIGO<sup>2</sup>, AND J. D. DESJARDINS<sup>1</sup>

<sup>1</sup>Clemson University, Clemson, SC, <sup>2</sup>Greenville Hospital System/Steadman Hawkins Clinic of the Carolinas, Greenville, SC

#### PS-7B-13-156 Histomorphometry of Varying Hydroxyapatite Scaffold Architectures *In Vivo*

B. M. SINGLETON<sup>1</sup>, J. W. HERNANDEZ<sup>1</sup>, M. R. APPLEFORD<sup>1</sup>, J. WALKER<sup>2</sup>, T. GUDA<sup>2</sup>, M. PILIA<sup>1</sup>, J-S. SON<sup>1</sup>, D. S. OH<sup>1</sup>, J. L. ONG<sup>1</sup>, AND J. WENKE<sup>2</sup>

<sup>1</sup>University of Texas at San Antonio, San Antonio, TX, <sup>2</sup>US Army Institute of Surgical Research, San Antonio, TX

#### PS-7B-13-157 Fatigue Resistant Surface Crosslinked UHMWPE for Total Joints

E. ORAL<sup>1,2</sup>, S. L. ROWELL<sup>1</sup>, A. L. NEILS<sup>1</sup>, AND O. K. MURATOGLU<sup>1,2</sup>

<sup>1</sup>Massachusetts General Hospital, Boston, MA, <sup>2</sup>Harvard Medical School, Boston, MA

#### PS-7B-13-158 Assessment of New Damage Scoring Methodology for Total Knee Replacement Retrieval Analysis

E. ALVAREZ<sup>1</sup>, M. E. ELPERS<sup>1</sup>, H. M. CASH<sup>1</sup>, M. E. WABLER<sup>1</sup>, AND J. D. DESJARDINS<sup>1</sup>

<sup>1</sup>Clemson University, Clemson, SC

#### PS-7B-13-159 Multi-release Model of Resorbable Bilayer Membranes for Bone Regeneration

A. SATSANGI<sup>1,2</sup>, B. XIAO<sup>1,2</sup>, AND J. ONG<sup>1</sup>

<sup>1</sup>University of Texas at San Antonio, San Antonio, TX, <sup>2</sup>University of Texas Health Science Center at San Antonio, San Antonio, TX

#### PS-7B-13-160 Coralline Calcium Phosphate Analysis for Bone Graft Applications

B. E. POLLOT<sup>1</sup>, T. GUDA<sup>1,2</sup>, S. OH<sup>1</sup>, AND J. ONG<sup>1</sup>

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#### PS-7B-13-161 Effects of Curvature on Varying Silk Fibroin/Hydroxyapatite on Stromal Cells *In Vitro*

M. PILIA<sup>1,2</sup>, B. M. SINGLETON<sup>1,2</sup>, S. M. CRUMLETT<sup>1,2</sup>, AND M. R. APPLEFORD<sup>1</sup>

<sup>1</sup>University of Texas at San Antonio, San Antonio, TX, <sup>2</sup>University of Texas Health Science Center at San Antonio, San Antonio, TX

#### PS-7B-13-162 BMP-2 - Bound Hydroxyapatite Implants

S. SHIELDS<sup>1</sup>, D. OH<sup>1</sup>, AND J. L. ONG<sup>1</sup>

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## Track: Orthopedic and Rehabilitation Engineering – PS-7B-14

### Orthopaedic Cellular Engineering

#### PS-7B-14-163 AGEs Promote *In Vitro* Bone Resorption Activities of Human Cortical Bone

D. BHATTACHARYA<sup>1</sup>, X. N. DONG<sup>1</sup>, X. WANG<sup>1</sup>, Q. AN<sup>2</sup>, AND J. XU<sup>2</sup>

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## Track: Respiratory Engineering – PS-7B-15

### Lung Computational Fluid Dynamics and Particle Deposition

#### PS-7B-15-164 Semi-infinite Gas Bubble Propagation in a 2D Channel with a Mucus Layer

C-F. TAI<sup>1</sup>, AND J. B. GROTEBERG<sup>1</sup>

<sup>1</sup>University of Michigan, Ann Arbor, MI

#### PS-7B-15-165 Oxygenation of Blood Flowing in a Porous-Walled Microchannel

J. WRIGHT<sup>1</sup>, R. C. EBERHART<sup>2</sup>, AND C-J. CHUONG<sup>1</sup>

<sup>1</sup>University of Texas at Arlington, Arlington, TX, <sup>2</sup>UT Southwestern Medical Center, Dallas, TX

#### PS-7B-15-166 Large Eddy Simulations Of Turbulent Flow And Particle Transport In A Human Airway Model

H. RADHAKRISHNAN<sup>1</sup>, AND S. C. KASSINOS<sup>1</sup>

<sup>1</sup>University of Cyprus, Nicosia, Nicosia, Cyprus

#### PS-7B-15-167 A Computational Study of Surfactant Biophysical Interactions During Pulsatile Airway Reopening

J. E. PILLERT<sup>1</sup>, H. FUJIOKA<sup>1</sup>, D. HALPERN<sup>2</sup>, AND D. P. GAVER<sup>1</sup>

<sup>1</sup>Tulane University, New Orleans, LA, <sup>2</sup>University of Alabama, Tuscaloosa, Alabama

#### PS-7B-15-168 The Development of DSP Techniques to Estimate Stress Fields in Biological Two-phase Flows

J. W. THIEMAN<sup>1</sup>, B. J. SMITH<sup>1</sup>, AND D. P. GAVER<sup>1</sup>

<sup>1</sup>Tulane University, New Orleans, LA

#### PS-7B-15-169 Multiscale Modeling of the Rodent Respiratory System

S. KABLAN<sup>1</sup>, A. P. KUPPRAT<sup>2</sup>, R. A. CORLEY<sup>2</sup>, J. P. CARSON<sup>2</sup>, K. R. MINARD<sup>2</sup>, R. E. JACOB<sup>2</sup>, M. P. HLASTALA<sup>1</sup>, AND D. R. EINSTEIN<sup>2</sup>

<sup>1</sup>University of Washington, Seattle, WA, <sup>2</sup>Pacific Northwest National Laboratory, Richland, WA

**PS-7B-15-170** Transient Displacement of a Gas Finger in a Channel Filled by a Bingham FluidP. ZAMANKHAN<sup>1</sup>, S. TAKAYAMA<sup>1</sup>, AND J. GROTEBERG<sup>1</sup><sup>1</sup>University of Michigan, Ann Arbor, MI**PS-7B-15-171** Flow and Particle Dispersion in Prototypical and Strain-driven CT-based Acinar ModelsH. KUMAR<sup>1</sup>, Y. YIN<sup>1</sup>, D. VASILESCU<sup>1,2</sup>, M. TAWHAI<sup>3</sup>, E. A. HOFFMAN<sup>1</sup>, AND C-L. LIN<sup>1</sup><sup>1</sup>The University of Iowa, Iowa City, IA, <sup>2</sup>Philipps University, Marburg, Germany, <sup>3</sup>The University of Auckland, Auckland, New Zealand**PS-7B-15-172** Developing a MDCT-based Breathing Lung Model for CFD Simulation of Air FlowY. YIN<sup>1</sup>, J. CHOI<sup>1</sup>, E. A. HOFFMAN<sup>1</sup>, AND C-L. LIN<sup>1</sup><sup>1</sup>The University of Iowa, Iowa City, IA**PS-7B-15-173** Multiscale Subject Specific Breathing Lung SimulationJ. CHOI<sup>1</sup>, Y. YIN<sup>1</sup>, M. H. TAWHAI<sup>3</sup>, E. A. HOFFMAN<sup>1</sup>, AND C-L. LIN<sup>1</sup><sup>1</sup>The University of Iowa, Iowa City, IA, <sup>2</sup>Bioengineering Institute, The University of Auckland, Auckland, New Zealand**Track: Respiratory Engineering – PS-7B-16****Mechanobiology in the Lung****PS-7B-16-174** Optimization of the Geometry of the Unrestrained Acoustic PlethysmographJ. REYNOLDS<sup>1</sup>, AND D. FRAZER<sup>1</sup><sup>1</sup>NIOSH, Morgantown, WV**PS-7B-16-175** Interpreting H of the Constant Phase Model in Terms of the Recruitment – De-recruitment (R-D) Model for Excised LungsD. FRAZER<sup>1</sup>, J. REYNOLDS<sup>1</sup>, T. GOLDSMITH<sup>1</sup>, M. JACKSON<sup>1</sup>, W. MCKINNEY<sup>1</sup>, AND A. AFSHARI<sup>1</sup><sup>1</sup>NIOSH, Morgantown, WV**PS-7B-16-176** The Effects of Mechanotransduction on Airway Smooth Muscle Protein ExpressionC. MILLER<sup>1</sup><sup>1</sup>Saint Louis University, St Louis, MO**PS-7B-16-177** Evaluation of Cellular Damage Near Bifurcations in a Model of AtelectraumaD. MARTIN<sup>1</sup>, A-M. JACOB<sup>1</sup>, AND D. P. GAVER<sup>1</sup><sup>1</sup>Tulane University, New Orleans, LA**PS-7B-16-178** Effects of Static Stretch on the Deterioration of Lung Parenchyma by Interstitial CollagenaseE. YI<sup>1</sup>, E. BARTOLAK-SUKI<sup>1</sup>, S. SATO<sup>1</sup>, T. BLUTE<sup>1</sup>, AND B. SUKI<sup>1</sup><sup>1</sup>Boston University, Boston, MA**PS-7B-16-179** Probing Softness of Parietal Pleural Surface by Atomic Force MicroscopyJ. KIM<sup>1</sup>, J. P. BUTLER<sup>1,2</sup>, AND S. H. LORING<sup>1</sup><sup>1</sup>Beth Israel Deaconess Medical Center and Harvard Medical School, Boston, MA, <sup>2</sup>Harvard School of Public Health, Boston, MA**PS-7B-16-180** Effects of Cyclic Stretch on Collagen Secretion and Integrin  $\beta 1$  in Cultured Mouse FibroblastsE. BARTOLAK-SUKI<sup>1,2</sup>, R. SUKI<sup>1</sup>, AND B. SUKI<sup>1</sup><sup>1</sup>Boston University, Boston, MA, <sup>2</sup>Cellultraf Sci., Inc., Boston, MA**Track: Systems Biology, Bioinformatics and Computational Biology – PS-7B-17****Multiscale Modeling****PS-7B-17-181** Utility of Simple Algorithms in Heart Rate Signal Quality AssessmentsK. M. LEE<sup>1</sup>, M. J. BULLER<sup>1</sup>, W. J. THARION<sup>1</sup>, J. PISANI<sup>2</sup>, S. R. GORDON<sup>2</sup>, AND B. A. BEIDLEMAN<sup>1</sup><sup>1</sup>US Army Research Institute of Environmental Medicine, Natick, MA, <sup>2</sup>Hidalgo, Ltd, Swavesey, United Kingdom**PS-7B-17-182** The Value of Biomedical Simulation Environments to Future Human Space Flight MissionsL. MULUGETA<sup>1</sup>, J. G. MYERS<sup>2</sup>, N. G. SKYTLAND<sup>3</sup>, AND S. H. PLATTS<sup>3</sup><sup>1</sup>Universities Space Research Association, Houston, TX, <sup>2</sup>NASA - Glenn Research Center, Cleveland, OH, <sup>3</sup>NASA - Johnson Space Center, Houston, TX**PS-7B-17-183** Multi-scale Modeling of Tumor Necrosis Factor-regulated Granuloma Formation in TuberculosisM. FALLAHI-SICHANI<sup>1</sup>, M. EL-KEBIR<sup>2,3</sup>, S. MARINO<sup>2</sup>, D. E. KIRSCHNER<sup>2</sup>, AND J. J. LINDERMAN<sup>1</sup><sup>1</sup>University of Michigan, Ann Arbor, MI, <sup>2</sup>University of Michigan Medical School, Ann Arbor, MI, <sup>3</sup>VU University Amsterdam, Amsterdam, Netherlands**PS-7B-17-184** 3D Finite Element Modeling of Human Ear from Ear Canal to Cochlea in Otitis Media with EffusionR. Z. GAN<sup>1</sup>, F. YANG<sup>1</sup>, AND X. ZHANG<sup>1</sup><sup>1</sup>University of Oklahoma, Norman, OK**PS-7B-17-185** Common Gene Network Motifs for Multistability and Cell DifferentiationX. WANG<sup>1</sup>, AND J. J. COLLINS<sup>2</sup><sup>1</sup>Arizona State University, Tempe, AZ, <sup>2</sup>Boston University, Boston, MA**PS-7B-17-186** Biomechanical Modeling of Eye Trauma for Different Orbit AnthropometriesA. A. WEAVER<sup>1,2</sup>, K. L. LOFTIS<sup>1,2</sup>, S. M. DUMA<sup>1,3</sup>, AND J. D. STITZEL<sup>1,2</sup><sup>1</sup>Virginia Tech-Wake Forest University Center for Injury Biomechanics, Winston-Salem, NC, <sup>2</sup>Wake Forest University School of Medicine, Winston-Salem, NC, <sup>3</sup>Virginia Polytechnic Institute and State University, Blacksburg, VA**PS-7B-17-187** Evaluation of Different Projectiles in Matched Experimental Eye Impact SimulationsA. A. WEAVER<sup>1,2</sup>, E. A. KENNEDY<sup>3</sup>, S. M. DUMA<sup>1,4</sup>, AND J. D. STITZEL<sup>1,2</sup><sup>1</sup>Virginia Tech-Wake Forest University Center for Injury Biomechanics, Winston-Salem, NC, <sup>2</sup>Wake Forest University School of Medicine, Winston-Salem, NC, <sup>3</sup>Bucknell University, Lewisburg, PA, <sup>4</sup>Virginia Polytechnic Institute and State University, Blacksburg, VA**PS-7B-17-188** Quantitative Analysis of Damage Evolution in Porcine Liver via Interruption Testing ApproachJ. CHEN<sup>1</sup>, B. BRAZILE<sup>1</sup>, L. PRIDDY<sup>1</sup>, M. HORSTEMEYER<sup>1</sup>, L. WILLIAMS<sup>1</sup>, AND J. LIAO<sup>1</sup><sup>1</sup>Mississippi State University, Mississippi State, MS**PS-7B-17-189** Collagen Fiber Damage Assessed With Multiscale Mechanical ModelsE. A. SANDER<sup>1</sup>, M. F. HADI<sup>1</sup>, AND V. H. BAROCAS<sup>1</sup><sup>1</sup>University of Minnesota, Minneapolis, MN**PS-7B-17-190** High Rate Stress-strain Behavior: A Comparative Study of Brain, Liver, and TendonJ. CLEMMER<sup>1</sup>, J. CHEN<sup>1</sup>, J. LIAO<sup>1</sup>, L. WILLIAMS<sup>1</sup>, L. PRIDDY<sup>1</sup>, R. PRABHU<sup>2</sup>, AND M. HORSTEMEYER<sup>1,2</sup><sup>1</sup>Mississippi State University, Mississippi State University, MS, <sup>2</sup>Center for Advanced Vehicular Systems, Starkville, MS**PS-7B-17-191** Humans Exploit Redundancy to Control Step Variability in Treadmill WalkingJ. B. DINGWELL<sup>1</sup>, J. JOHN<sup>2</sup>, AND J. P. CUSUMANO<sup>3</sup><sup>1</sup>University of Texas, Austin, TX, <sup>2</sup>Penn State University, University Park, PA, <sup>3</sup>Pennsylvania State University, University Park, PA

**PS-7B-17-192 Rule-Based Simulation of Vein Graft Remodeling**M. HWANG<sup>1</sup>, S. A. BERCELI<sup>1,2</sup>, M. GARBEY<sup>2</sup>, AND R. TRAN-SON-TAY<sup>1</sup><sup>1</sup>University of Florida, Gainesville, FL, <sup>2</sup>Malcom Randall VAMC, Gainesville, FL, <sup>3</sup>University of Houston, Houston, TX**PS-7B-17-193 Computational Analysis of Endothelial Dysfunction on Free Radical Transport in Microcirculation**S. KAR<sup>1</sup>, AND M. KAVDIA<sup>1</sup><sup>1</sup>University of Arkansas, Fayetteville, AR**PS-7B-17-194 Predicting the Dynamics of Arbitrarily Shaped Micro/Nanoparticles in a Capillary Flow**M. D. DE TULLIO<sup>1</sup>, G. ADRIANI<sup>1</sup>, P. DECUZZI<sup>2</sup>, P. DE PALMA<sup>1</sup>, AND G. PASCAZIO<sup>1</sup><sup>1</sup>Politecnico di Bari, Bari, Bari, Italy, <sup>2</sup>The University of Texas Medical School at Houston, Houston, TX**PS-7B-17-195 Modeling Circadian Rhythms in Human Endotoxemia**J. D. SCHEFF<sup>1</sup>, S. E. CALVANO<sup>2</sup>, S. F. LOWRY<sup>2</sup>, AND I. P. ANDROULAKIS<sup>1</sup><sup>1</sup>Rutgers University, Piscataway, NJ, <sup>2</sup>UMDNJ-Robert Wood Johnson Medical School, New Brunswick, NJ**PS-7B-17-196 Modeling of Bioheat Transfer in Human Kidney and Experimental Validation *In Vivo***Y. FENG<sup>1</sup>, D. PAREKH<sup>2</sup>, J. A. LONG<sup>1</sup>, R. CANTY<sup>1</sup>, AND L. DAVILA<sup>1</sup><sup>1</sup>UTSA, San Antonio, TX, <sup>2</sup>UTHSCSA, San Antonio, TX**PS-7B-17-197 New Tools for Multiscale Cell-to-Organ Modeling Using Deformable 3D Atlases**J. P. CARSON<sup>1</sup>, T. JU<sup>2</sup>, AND I. A. KAKADIARIS<sup>3</sup><sup>1</sup>Pacific Northwest National Lab, Richland, WA, <sup>2</sup>Washington University in St. Louis, St. Louis, MO, <sup>3</sup>University of Houston, Houston, TX**PS-7B-17-198 Promoting Behavioral Rules to Agents in Modeling Angiogenesis**B. LONG<sup>1</sup>, AND A. QUTUB<sup>1</sup><sup>1</sup>Rice University, Houston, TX**PS-7B-17-199 Application of a Novel Soft Tissue Modulus Evaluation Assay to Breast Tumor Tissue**S. BARNES<sup>1</sup>, AND M. MIGA<sup>1</sup><sup>1</sup>Vanderbilt University, Nashville, TN**PS-7B-17-200 Multi-scale Agent-based Modeling of Human Endotoxemia**T. T. NGUYEN<sup>1</sup>, S. S. CALVANO<sup>2</sup>, S. F. LOWRY<sup>2</sup>, AND I. P. ANDROULAKIS<sup>1</sup><sup>1</sup>Rutgers University, Piscataway, NJ, <sup>2</sup>UMDNJ-Robert Wood Johnson Medical School, New Brunswick, NJ**PS-7B-17-201 Multiscale Disease Model of Heart Failure and Renal Disease with Therapeutic Application in Drug R&D**A. SARKAR<sup>1</sup>, M. K. HALLOW<sup>1</sup>, A. SOUBRET<sup>1</sup>, G. HELMLINGER<sup>1</sup>, R. SARANGAPANI<sup>1</sup>, S. ERMAKOV<sup>2</sup>, A. LO<sup>2</sup>, M. RODRIGO<sup>2</sup>, J. BEH<sup>2</sup>, H. D. LEON<sup>2</sup>, AND A. GEORGIEVA<sup>1</sup><sup>1</sup>Novartis Pharmaceuticals, East Hanover, NJ, <sup>2</sup>Entelos Inc., Foster City, CA**PS-7B-17-202 Combination of Top-Down and Bottom-Up Tumor Modeling Including Chemotherapeutic Drug Treatment**B. M. FOX<sup>1</sup>, R. A. MOFFITT<sup>1</sup>, AND M. D. WANG<sup>1</sup><sup>1</sup>Georgia Institute of Technology, Atlanta, GA**Track: Systems Biology, Bioinformatics and Computational Biology – PS-7B-18****Signals and Networks in Cancer and Disease****PS-7B-18-203 Olive: A Software Tool for Identifying Fusion Transcripts in Cancer Using RNA-Seq**C. BEITEL<sup>1</sup>, AND J. MA<sup>1</sup><sup>1</sup>University of Illinois at Urbana-Champaign, Urbana, IL**PS-7B-18-204 Modeling the Kinetics of Hsp90 Inhibition to Reduce Immune Mediated Inflammation**S. K. SHIMP<sup>1</sup>, E. M. COURTNEY<sup>1</sup>, C. M. REILLY<sup>2,3</sup>, AND M. N. RYLANDER<sup>1</sup><sup>1</sup>Virginia Tech, Blacksburg, VA, <sup>2</sup>Virginia College of Osteopathic Medicine, Blacksburg, VA, <sup>3</sup>Virginia-Maryland Regional College of Veterinary Medicine, Blacksburg, VA**PS-7B-18-205 Mathematical Model of Hematopoietic Stem Cell Differentiation after Transplantation**S. M. PEARCE<sup>1</sup>, AND A. E. RUNDELL<sup>1</sup><sup>1</sup>Purdue University, West Lafayette, IN**PS-7B-18-206 Analysis of ErbB Inhibitor Sensitivity and ErbB Network Patterns in Epithelial Ovarian Cancer**R. D. PRASAD<sup>1</sup>, K. L. POLLOCK<sup>1</sup>, AND P. K. KREEGER<sup>1</sup><sup>1</sup>University of Wisconsin - Madison, Madison, WI**Track: Tissue Engineering – PS-7B-19****Neural Tissue Engineering****PS-7B-18-207 Autonomic Function of Assessment in Patients with Kidney Failure Before and After Hemodialysis Using Kernel Method and Entrainment Techniques**A. K. KAMAL<sup>1</sup><sup>1</sup>Tennessee Tech University, Cookeville, TN**PS-7B-18-208 Short and Long-Term Changes in Circulatory protein and cytokine profiles Following Burn and CLP Treatments**M. A. ORMAN<sup>1</sup>, I. ANDROULAKIS<sup>1</sup>, M. IERAPETITOU<sup>1</sup>, AND F. BERTHIAUME<sup>1</sup><sup>1</sup>Rutgers University, Piscataway, NJ**PS-7B-18-209 Gene Expression Profiling of Short- and Long-Term Changes in Rat Liver Following Burn Injury and CLP Treatment**Q. QIAN YANG<sup>1</sup>, M. A. ORMAN<sup>1</sup>, I. ANDROULAKIS<sup>1</sup>, F. BERTHIAUME<sup>1</sup>, AND M. IERAPETITOU<sup>1</sup><sup>1</sup>Rutgers University, Piscataway, NJ**PS-7B-18-210 Phosphorylation of Alanine-Directed Substrates by MAP-Kinases: an Over-looked Specificity?**T. S. KAOUD<sup>1</sup>, M. A. RAINEY<sup>2</sup>, L. LIU<sup>3</sup>, AND K. N. DALBY<sup>1</sup><sup>1</sup>Division of Medicinal Chemistry, College of Pharmacy, University of Texas at Austin, TX, Austin, TX, <sup>2</sup>Graduate Program in Molecular Biology, University of Texas at Austin, Austin, TX, <sup>3</sup>Graduate Program in Biochemistry, University of Texas at Austin, Austin, TX**PS-7B-18-211 Optimizing Alignment Algorithms to Quantify Cancer Signals in Next-Generation Sequencing Data**J. H. PHAN<sup>1</sup>, J. DALE<sup>1</sup>, C. F. QUO<sup>1</sup>, R. M. PARRY<sup>1</sup>, T. H. STOKES<sup>1</sup>, AND M. D. WANG<sup>1</sup><sup>1</sup>Georgia Tech and Emory University, Atlanta, GA**PS-7B-18-212 Computational Studies of the Effects of Interpersonal Variability on Cancer Drug Efficacy**L. CHU<sup>1</sup>, AND F. MAC GABHANN<sup>1</sup><sup>1</sup>Johns Hopkins University, Baltimore, MD**PS-7B-18-213 Modeling Insulin-mediated Growth Factor Signaling and Its Role in Diabetes**A. CHAKRABARTI<sup>1</sup>, S. NAYAK<sup>1</sup>, J. P. LEQUIEU<sup>1</sup>, AND J. D. VARNER<sup>1</sup><sup>1</sup>Cornell University, Ithaca, NY**PS-7B-19-214 Neurite Growth in PEG-Fibronectin Conjugate Hydrogels**W. ZHOU<sup>1,2</sup>, AND R. K. WILLITS<sup>1,2</sup><sup>1</sup>Saint Louis University, St. Louis, MO, <sup>2</sup>University of Akron, Akron, OH**PS-7B-19-215 Guidance of Dorsal Root Ganglion Neurites and Schwann Cells by Biomimetic Schwann Cell Topography**J. A. RICHARDSON<sup>1</sup>, C. W. REMENTER<sup>1</sup>, AND D. HOFFMAN-KIM<sup>1</sup><sup>1</sup>Brown University, Providence, RI

**PS-7B-19-216** Neural Tissue Engineering Scaffolds with Simultaneous Nanofibrous, Electrical, and Neurotrophic CuesC. A. MILROY<sup>1</sup>, J. Y. LEE<sup>1</sup>, AND C. E. SCHMIDT<sup>1</sup><sup>1</sup>University of Texas, Austin, TX**PS-7B-19-217** Neurite Growth in PEG Gels: Effect of Mechanical Stiffness and Laminin ConcentrationL. M. MARQUARDT<sup>1</sup>, AND R. K. WILLITS<sup>1</sup><sup>1</sup>Saint Louis University, St. Louis, MO**PS-7B-19-218** Effect of Additives on Neurite Growth in Collagen GelsS. SAHU<sup>1</sup>, K. E. SWINDLE-REILLY<sup>1</sup>, AND R. K. WILLITS<sup>1</sup><sup>1</sup>Saint Louis University, Saint Louis, MO**PS-7B-19-219** Controlled Release of Neurotrophic Factors from Silk Films for Nerve Cell FunctionA. R. NECTOW<sup>1</sup>, E. M. PRITCHARD<sup>1</sup>, AND D. L. KAPLAN<sup>1</sup><sup>1</sup>Tufts University, Medford, MA**PS-7B-19-220** Alignment of Basal Lamina Protein Extract Nanofibers and Its Effect on Schwann Cell Orientation.B. J. MUNDO<sup>1,2</sup>, R. L. MILLER<sup>1,2</sup>, AND P. J. VANDEVORD<sup>1,2</sup><sup>1</sup>Wayne State University, Detroit, MI, <sup>2</sup>John D. Dingell Veterans Affairs Medical Center, Detroit, MI**PS-7B-19-221** A Novel Plant Derived Scaffold for Tissue Engineering and Regenerative MedicineS. LENAGHAN<sup>1</sup>, K. SERPERSU<sup>1</sup>, L. XIA<sup>1</sup>, W. HE<sup>1</sup>, AND M. ZHANG<sup>2</sup><sup>1</sup>UTK, Knoxville, TN, <sup>2</sup>University of Tennessee, Knoxville, TN**PS-7B-19-222** Directing Neurite Outgrowth with Coaxial Electrospun Nanofibers Incorporating Nerve Growth Factor Concentration Gradient.. HANDARMIN<sup>1</sup>, AND S. CHEW<sup>1</sup><sup>1</sup>Nanyang Technological University, Singapore, Singapore, Singapore**PS-7B-19-223** Long Term Evaluation of Axonal Guidance Conduits Implanted into the Completely Transected Adult Rat Spinal CordA. HURTADO<sup>1,2</sup>, J. M. CREGG<sup>3</sup>, H. B. WANG<sup>4</sup>, D. F. WENDELL<sup>1</sup>, J. W. McDONALD<sup>1,2</sup>, AND R. J. GILBERT<sup>3</sup><sup>1</sup>Hugo W. Moser Research Institute at Kennedy Krieger, Baltimore, MD, <sup>2</sup>Johns Hopkins University, Baltimore, MD, <sup>3</sup>Michigan Technological University, Houghton, MI, <sup>4</sup>Syracuse University, Syracuse, NY**PS-7B-19-224** Significant stimulation of Glioblastoma Multiforme derived Conditioned Medium on Neuronal GrowthS. VASUDEVAN<sup>1</sup>, N. HALL<sup>1</sup>, AND Y-T. KIM<sup>1</sup><sup>1</sup>University of Texas at Arlington, Arlington, TX**PS-7B-19-225** Guiding Neuronal Cells in 3-Dimensions Using a Composite Scaffold SystemD. S. HERNANDEZ<sup>1</sup>, S. K. SEIDLITS<sup>1</sup>, C. E. SCHMIDT<sup>1</sup>, AND J. B. SHEAR<sup>1</sup><sup>1</sup>The University of Texas at Austin, Austin, TX**PS-7B-19-226** The Effect of Cell Viability on the Mechanical Properties of Acute Rat Brain Tissue SlicesS. J. LEE<sup>1</sup>, J. SUN<sup>2</sup>, H. XIE<sup>3</sup>, M. KING<sup>3</sup>, AND M. SARNTINORANONT<sup>1</sup><sup>1</sup>Department of Mechanical and Aerospace Engineering, Gainesville, FL, <sup>2</sup>Electrical and Computer Engineering, Gainesville, FL, <sup>3</sup>Pharmacology and Therapeutics, Gainesville, FL**PS-7B-19-227** Tissue Engineered Microconduits for Targeted Restoration of Axonal TractsD. CULLEN<sup>1</sup>, M. TANG-SCHOMER<sup>1</sup>, V. E. JOHNSON<sup>1</sup>, A. R. PATEL<sup>1</sup>, K. D. BROWNE<sup>1</sup>, AND D. H. SMITH<sup>1</sup><sup>1</sup>University of Pennsylvania, Philadelphia, PA**Track: Tissue Engineering – PS-7B-20****Novel Biomaterials and Scaffolds****PS-7B-20-228** Development of a Transplantable Liver Graft Using Decellularized Liver MatrixB. UYGUN<sup>1</sup>, A. SOTO-GUTIERREZ<sup>2</sup>, H. YAGI<sup>3</sup>, M-L. IZAMIS<sup>1</sup>, M. GUZZARDI<sup>1</sup>, F. BERTHIAUME<sup>1</sup>, Y. NAHMIA<sup>1</sup>, M. YARMUSH<sup>1</sup>, AND K. UYGUN<sup>1</sup><sup>1</sup>Massachusetts General Hospital, Harvard Medical School, Shriners Hospitals for Children, Boston, MA, <sup>2</sup>Children's Hospital of Pittsburgh, McGowan Institute for Regenerative Medicine and University of Pitt, Pittsburgh, PA, <sup>3</sup>Keio University School of Medicine, Tokyo, Japan**PS-7B-20-229** Engineering Compliant Polymeric Substrata for Myocardial ContractilityC. LEBLON<sup>1</sup>, AND S. JEDLICKA<sup>1</sup><sup>1</sup>Lehigh University, Bethlehem, PA**PS-7B-20-230** Mechanical Properties and In Vitro Cytocompatibility of Nanocomposite Polymer HydrogelsP. SCHEXNAILDER<sup>1</sup>, A. GAHARWAR<sup>1</sup>, C-J. WU<sup>1</sup>, AND G. SCHMIDT<sup>1</sup><sup>1</sup>Purdue University, West Lafayette, IN**PS-7B-20-231** Rotary Jet-Spinning: A Novel Technique of Nanofibrous Scaffold FabricationM. R. BADROSSAMAY<sup>1,2</sup>, H. A. MCILWEE<sup>1,2</sup>, J. A. GOSS<sup>1,2</sup>, AND K. K. PARKER<sup>1,2</sup><sup>1</sup>Disease Biophysics Group, School of Engineering and Applied Sciences, Harvard University, Cambridge, MA, <sup>2</sup>Wyss Institute for Biologically Inspired Engineering, Harvard University, Boston, MA**PS-7B-20-232** Chondrogenitor Cells Differentiation on 3D DBM ScaffoldS. CAI<sup>1</sup>, K. KUWAHARA<sup>1</sup>, Z. YANG<sup>1</sup>, AND B. HAN<sup>1</sup><sup>1</sup>University of Southern California, Los Angeles, CA**PS-7B-20-233** Tunable Degradation in Protein/Synthetic Electrospun CompositesJ. KLUGE<sup>1</sup>, E. GIL<sup>2</sup>, D. L. KAPLAN<sup>2</sup>, AND R. L. MAUCK<sup>1</sup><sup>1</sup>University of Pennsylvania, Philadelphia, PA, <sup>2</sup>Tufts University, Medford, MA**PS-7B-20-234** Silk-Human Tropoelastin Blend BiomaterialsX. HU<sup>1</sup>, X. WANG<sup>1</sup>, J. RNJAK<sup>2</sup>, A. S. WEISS<sup>2</sup>, AND D. L. KAPLAN<sup>1</sup><sup>1</sup>Tufts University, Medford, MA, <sup>2</sup>The University of Sydney, Sydney, NSW, Australia**PS-7B-20-235** Influencing Elastin Production In Vitro Using an Elastin Mimetic PeptideD. PATEL<sup>1</sup>, R. MENON<sup>1</sup>, AND L. TAITE<sup>1</sup><sup>1</sup>Georgia Institute of Technology, Atlanta, GA**PS-7B-20-236** Fabrication of Functional Hydrogel Nano-structures for Biomolecule ConjugationsR. T-S. LAM<sup>1</sup>, J-W. JANG<sup>1</sup>, P. L. STILES<sup>1</sup>, AND S. R. NETTIKADAN<sup>1</sup><sup>1</sup>Nanolnk, Inc., Skokie, IL**PS-7B-20-237** Assessment of Using Laponite Cross-linked Poly(ethylene oxide) as Biomaterial for Bone RepairA. K. GAHARWAR<sup>1</sup>, P. J. SCHEXNAILDER<sup>1</sup>, C-J. WU<sup>1</sup>, B. KLINE<sup>1</sup>, AND G. SCHMIDT<sup>1</sup><sup>1</sup>Purdue University, West Lafayette, IN**PS-7B-20-238** Predicting and Improving Gaseous Exchange in Composite Biomaterial ConstructsJ. C. WHITE<sup>1</sup>, W. L. STOPPEL<sup>1</sup>, S. C. ROBERTS<sup>1</sup>, AND S. R. BHATIA<sup>1</sup><sup>1</sup>University of Massachusetts Amherst, Amherst, MA

**PS-7B-20-239 Novel Methacrylated Gellan Gum Hydrogels with Tunable Mechanical Properties**D. F. COUTINHO<sup>1,2</sup>, S. SANT<sup>3</sup>, H. SHIN<sup>3,4</sup>, J. T. OLIVEIRA<sup>1,5</sup>, M. E. GOMES<sup>1,5</sup>, N. NEVES<sup>1,5</sup>, A. KHADEMHOSEINI<sup>2,3</sup>, AND R. REIS<sup>1,6</sup><sup>1</sup>Bs Research Group, Biomaterials Biodegradables and Biomimetics, Guimarães, Portugal, <sup>2</sup>Harvard MIT Division of Health Sciences and Technology, Cambridge, MA, <sup>3</sup>Center for Biomedical Engineering, Department of Medicine, Brigham and Womens Hospital, Cambridge, MA, <sup>4</sup>Department of Materials Science and Engineering, Massachusetts Institute of Technology, Cambridge, MA, <sup>5</sup>IBB, Institute for Biotechnology and Bioengineering, PT Government Associated Laboratory, Braga, Portugal, <sup>6</sup>IBB Institute for Biotechnology and Bioengineering, PT Government Associated Laboratory, Braga, Portugal**PS-7B-20-240 PC12 Behavior in Modular PEG Scaffolds: Effects of Stiffness and Protein Concentration**R. A. SCOTT<sup>1</sup>, AND R. K. WILLITS<sup>1</sup><sup>1</sup>Saint Louis University, St. Louis, MO**PS-7B-20-241 Novel Polyurethane/Carbon Nanofiber Composites for Bladder Cancer Applications**M. Tsang<sup>1</sup>, Y. W. Chun<sup>1</sup>, and T. J. Webster<sup>1</sup><sup>1</sup>Brown University, Providence, RI**PS-7B-20-242 Elastin Mimetic Hybrid Polymers as Conductive Scaffolds for Tissue Engineering**S. E. GRIESHABER<sup>1</sup>, A. J. FARRAN<sup>1</sup>, K. L. KIICK<sup>1</sup>, AND X. JIA<sup>1</sup><sup>1</sup>University of Delaware, Newark, DE**PS-7B-20-243 Unique Electrochemically Synthesized Polypyrrole:poly(lactic-co-glycolic acid) Blends for Biomedical Applications**L. FORCINITI<sup>1</sup>, N. K. GUIMARD<sup>1</sup>, S. LEE<sup>1</sup>, AND C. E. SCHMIDT<sup>1</sup><sup>1</sup>The University of Texas at Austin, Austin, TX**PS-7B-20-244 Biocompatible Detachable Polyelectrolyte Multilayer Films for Applications in Tissue Engineering**A. L. LARKIN<sup>1</sup>, R. M. DAVIS<sup>1</sup>, AND P. RAJAGOPALAN<sup>1</sup><sup>1</sup>Virginia Tech, Blacksburg, VA**PS-7B-20-245 Development of Gold Nanoparticle Entrapped Polyethylene Terephthalate for Soft Tissue Repair**O. E. WHELOVE<sup>1</sup>, AND S. A. GRANT<sup>1</sup><sup>1</sup>University of Missouri, Columbia, MO**PS-7B-20-246 Characterization of Salt Templated Hyaluronic Acid Hydrogels for Neural Wound Healing**R. C. THOMAS<sup>1</sup>, AND C. E. SCHMIDT<sup>1</sup><sup>1</sup>University of Texas at Austin, Austin, TX**PS-7B-20-247 Use of PNIPAAm-PEG, an Injectable Scaffold for Spinal Cord Repair, in an In Vivo Rodent Model of Spinal Cord Injury**L. CONOVA<sup>1,2</sup>, J. VERNENGO<sup>3</sup>, Y. JIN<sup>2</sup>, I. FISCHER<sup>2</sup>, B. NEUHUBER<sup>2</sup>, AND A. LOWMAN<sup>1</sup><sup>1</sup>Drexel University, Philadelphia, PA, <sup>2</sup>Drexel University College of Medicine, Philadelphia, PA, <sup>3</sup>Rowan University, Glassboro, NJ**PS-7B-20-248 Bile Acid and Cholesterol Metabolism in 3D Liver Mimics**C. J. DETZEL<sup>1</sup>, Y. KIM<sup>1</sup>, AND P. RAJAGOPALAN<sup>1</sup><sup>1</sup>Virginia Polytechnic Institute and State University, Blacksburg, VA**PS-7B-20-249 Characterizing an Agarose-PEG Interpenetrating Network Hydrogel for Cartilage Tissue Engineering**B. J. DEKOSKY<sup>1</sup>, N. H. DORMER<sup>1</sup>, G. C. INGAVLE<sup>1</sup>, M. S. DETAMORE<sup>1</sup>, AND S. H. GEHRKE<sup>1</sup><sup>1</sup>University of Kansas, Lawrence, KS**PS-7B-20-250 PDMSstar-PEG Hydrogel Scaffolds with Tunable Properties**B. M. BAILEY<sup>1</sup>, K. HUI<sup>1</sup>, AND M. A. GRUNLAN<sup>2</sup><sup>1</sup>Texas A&M University, College Station, TX, <sup>2</sup>Texas A&M University, College Station, TX**PS-7B-20-251 Mechanical and Structural Characteristics of Multi-Component Biopolymer Networks**L. HYLAND<sup>1</sup>, M. TARABAN<sup>1</sup>, AND Y. YU<sup>1</sup><sup>1</sup>University of Maryland-College Park, College Park, MD**PS-7B-20-252 Modular PEG Scaffolds: Examination of Microgel Fabrication Conditions and Scaffold Properties**L. VANDIVER<sup>1</sup>, J. STUKEL<sup>1</sup>, AND R. K. WILLITS<sup>1,2</sup><sup>1</sup>Saint Louis University, St. Louis, MO, <sup>2</sup>University of Akron, Akron, OH**PS-7B-20-253 Double-Gelling Hydrogels for Endovascular Embolization of Aneurysms**H. H. BEARAT<sup>1</sup>, C. PAUKEN<sup>1</sup>, AND B. L. VERNON<sup>1</sup><sup>1</sup>Arizona State University, Tempe, AZ**PS-7B-20-254 Controlling Morphology of Blown Shape Memory Polyurethane Foams**P. SINGHAL<sup>1</sup>, T. S. WILSON<sup>2</sup>, AND D. J. MAITLAND<sup>1</sup><sup>1</sup>Texas A&M University, College Station, TX, <sup>2</sup>Lawrence Livermore National Laboratory, Livermore, CA**PS-7B-20-255 Synthetic Substrates for the Study of the Impact of Material Mechanics on Cellular Functions**A. T. LEONARD<sup>1</sup>, J. R. FUNSTON<sup>1</sup>, K. N. CICOTTE<sup>1,2</sup>, AND E. L. HEDBERG-DIRK<sup>1</sup><sup>1</sup>University of New Mexico, Albuquerque, NM, <sup>2</sup>Sandia National Laboratories, Albuquerque, NM**PS-7B-20-256 Controlled Deposition of Electrospun Silk Fiber Meshes with Anisotropic Mechanical Properties**R. R. JOSE<sup>1</sup>, R. ELIA<sup>1</sup>, AND R. A. PEATTIE<sup>1</sup><sup>1</sup>Tufts University, Medford, MA**PS-7B-20-257 Effects of Carbon Nanotube-Collagen Scaffolds on Cell Proliferation, Differentiation, and Inflammatory Response in Mesenchymal Stem Cells**R. BAKTUR<sup>1</sup>, AND S. KWON<sup>1</sup><sup>1</sup>Utah State University, Logan, UT**PS-7B-20-258 Self-assembled Three-dimensional Conductive Scaffolds for Stimulated Cell Culture**J-O. YOU<sup>1</sup>, M. RAFAT<sup>1</sup>, G. YE<sup>1</sup>, AND D. T. AUGUSTE<sup>1</sup><sup>1</sup>Harvard University, Cambridge, MA**PS-7B-20-259 Novel Bioactive Hydrogels for Aneurysm Treatment**M. RAFAT<sup>1</sup>, AND D. T. AUGUSTE<sup>1</sup><sup>1</sup>Harvard University, Cambridge, MA**PS-7B-20-260 A Plant (Chinese Yam) Derived Scaffold for Tissue Engineering**L. XIA<sup>1</sup>, S. LENAGHAN<sup>1</sup>, A. WILLS<sup>1</sup>, AND M. ZHANG<sup>2</sup><sup>1</sup>UTK, Knoxville, TN, <sup>2</sup>University of Tennessee, Knoxville, TN**PS-7B-20-261 Development of an In Vitro Model for Studying Corneal Epithelial-Stromal Interactions**W. M. PETROLL<sup>1</sup>, L. MA<sup>1</sup>, AND D. M. ROBERTSON<sup>1</sup><sup>1</sup>Southwestern Medical Center, Dallas, TX**PS-7B-20-262 Engineered Matrix Mimetics Support Assembly of a Growth-Promoting Fibronectin Matrix**D. C. ROY<sup>1</sup>, AND D. C. HOCKING<sup>1</sup><sup>1</sup>University of Rochester, Rochester, NY**PS-7B-20-263 Thermomechanical Characterization and Model Predictions of a Polyurethane Shape Memory Polymer**B. L. VOLK<sup>1</sup>, D. C. LAGOUDAS<sup>1</sup>, AND D. J. MAITLAND<sup>1</sup><sup>1</sup>Texas A&M University, College Station, TX**PS-7B-20-264 Selective improvement of TNF Capture in a Cytokine Hemoadsorption Device Using Immobilized anti-TNF**M. V. DILEO<sup>1</sup>, AND W. J. FEDERSPIEL<sup>1</sup><sup>1</sup>University of Pittsburgh, Pittsburgh, PA**PS-7B-20-265 Micro-Computed Tomography Characterization of Shape Memory Polymer Foams**J. N. RODRIGUEZ<sup>1</sup>, A. MUSCHENBORN<sup>1</sup>, F. J. CLUBB<sup>1</sup>, T. S. WILSON<sup>2</sup>, AND D. J. MAITLAND<sup>1</sup><sup>1</sup>Texas A&M University, College Station, TX, <sup>2</sup>Lawrence Livermore National Laboratory, Livermore, CA

**PS-7B-20-266** Keratin Biomaterials for Tissue Engineering and Regenerative Medicine ApplicationsJ. ROUSE<sup>1</sup>, AND M. VAN DYKE<sup>1</sup><sup>1</sup>Wake Forest University School of Medicine, Winston Salem, NC**PS-7B-20-267** Water Absorption Influence on the Properties of Shape Memory PolymerY-J. YU<sup>1</sup>, P. SINGHAL<sup>1</sup>, T. S. WILSON<sup>2</sup>, AND D. J. MAITLAND<sup>1</sup><sup>1</sup>Texas A&M University, College Station, TX, <sup>2</sup>Lawrence Livermore National Laboratory, Livermore, CA**PS-7B-20-268** Investigation of Polycaprolactone and Hydroxyapatite Whiskers ScaffoldG. B. CAMARGO CARDOSO<sup>1</sup>, P. B. REGO<sup>1</sup>, S. L. RAMOS<sup>1</sup>, C. A. ZAVAGLIA<sup>1</sup>, AND A. F. ARRUDA<sup>1</sup><sup>1</sup>Unicamp, Campinas, São Paulo, Brazil**PS-7B-20-269** Designing Fibrin Microthread-Based Scaffolds for Skeletal Muscle RegenerationJ. GRASMAN<sup>1,2</sup>, C. MALCUI<sup>2,3</sup>, R. PAGE<sup>1,3</sup>, T. DOMINKO<sup>1,3</sup>, AND G. PINS<sup>1,2</sup><sup>1</sup>Worcester Polytechnic Institute, Worcester, MA, <sup>2</sup>Bioengineering Institute, Worcester, MA, <sup>3</sup>CellThera Inc., Worcester, MA**PS-7B-20-270** Preparation and Characterization of a Skeletal Muscle ECM ScaffoldM. T. WOLF<sup>1</sup>, K. A. DALY<sup>1</sup>, AND S. F. BADYLAK<sup>1</sup><sup>1</sup>University of Pittsburgh, Pittsburgh, PA**PS-7B-20-271** Hybrid Biomaterials for Biomedical ApplicationsE. REATEGUI<sup>1</sup>, L. KASINKAS<sup>1</sup>, AND A. AKSAN<sup>1</sup><sup>1</sup>University of Minnesota, Minneapolis, MN**PS-7B-20-272** Redox-Initiated Crosslinking of Cellulosic Hydrogels or Soft Tissue AugmentationM. S. GUPTA<sup>1</sup>, E. S. COOPER<sup>1</sup>, A. T. REZA<sup>1</sup>, AND S. B. NICOLL<sup>1</sup><sup>1</sup>The City College of New York, New York, NY**PS-7B-20-273** Evaluation of Electrospun Scaffolds for the Expansion of Precursors of Insulin-producing CellsM. PALACIO-OCHOA<sup>1,2</sup>, D. GALLEGU-PEREZ<sup>1</sup>, N. HIGUITA-CASTRO<sup>1</sup>, J. JOHNSON<sup>1</sup>, J. J. LANNUTTI<sup>1</sup>, K. J. GOOCH<sup>1</sup>, AND D. J. HANSFORD<sup>1</sup><sup>1</sup>The Ohio State University, Columbus, OH, <sup>2</sup>Antioquia School of Engineering, Envigado, Antioquia, Colombia**PS-7B-20-274** Role of Ascorbic Acid in S-transnitrosation Reaction - A kinetic AnalysisJ. GU<sup>1</sup>, V. MUTHUVIJAYAN<sup>2</sup>, AND R. LEWIS<sup>3</sup><sup>1</sup>Oklahoma State University, Stillwater, OK, <sup>2</sup>Johns Hopkins University, Baltimore, MD, <sup>3</sup>Brigham Young University, Provo, UT**PS-7B-20-275** Photo-polymerizable Nitric Oxide-releasing ElastomersY. WANG<sup>1</sup>, AND G. A. AMEER<sup>1,2</sup><sup>1</sup>Northwestern University, Evanston, IL, <sup>2</sup>Northwestern University, Chicago, IL**PS-7B-20-276** Mimicking the Extracellular Matrix via Controlled Multiple Thickness Deposition of Electrospun MatsR. ELIA<sup>1</sup>, R. R. JOSE<sup>1</sup>, AND R. A. PEATTIE<sup>1</sup><sup>1</sup>Tufts University, Medford, MA**PS-7B-20-277** Bactericidal Effect of Iron Oxide Nanoparticles on *Staphylococcus aureus*N. L. TRAN<sup>1</sup>, A. MIR<sup>2</sup>, D. MALLIK<sup>2</sup>, A. SINHA<sup>2</sup>, S. NAYAR<sup>2</sup>, AND T. J. WEBSTER<sup>1</sup><sup>1</sup>Brown University, Providence, RI, <sup>2</sup>National Metallurgical Laboratory, Jamshedpur, Jharkhand, India**PS-7B-20-278** Engineering Enabled Biomimetic Corneal StromaS. BANDA<sup>1</sup>, AND Y-T. KIM<sup>1</sup><sup>1</sup>University of Texas at Arlington, Arlington, TX**PS-7B-20-279** Synthesis and Characterization of Crosslinked Urethane-doped Block Polyester ElastomersA. KOLASNIKOV<sup>1</sup>, R. T. TRAN<sup>1</sup>, AND J. YANG<sup>1</sup><sup>1</sup>The University of Texas at Arlington, Arlington, TX**PS-7B-20-280** Design and Implementation of a Novel Nanofiber Dural SubstituteM. R. MACEWAN<sup>1</sup>, J. XIE<sup>1</sup>, W. Z. RAY<sup>1</sup>, D. SIEWE<sup>1</sup>, AND Y. XIA<sup>1</sup><sup>1</sup>Washington University, Saint Louis, MO**PS-7B-20-281** Adjustment of Hydrogel Scaffold Properties to Induce Responses of Corneal Epithelial CellsL. REIS<sup>1</sup>, AND P. SIT<sup>1</sup><sup>1</sup>Louisiana Tech University, Ruston, LA**PS-7B-20-282** Laser Microfabricated Poly(glycerol Sebacate) Scaffolds for Heart Valve Tissue EngineeringN. MASOUMI<sup>1</sup>, A. JEAN<sup>1</sup>, A. PARKAR<sup>1</sup>, AND G. C. ENGELMAYR<sup>1</sup><sup>1</sup>The Pennsylvania State University, University Park, PA**PS-7B-20-283** Engineered Basal Lamina: Fabrication and Its Biomedical ApplicationsS. BANDA<sup>1</sup>, S. VASUDEVAN<sup>1</sup>, D. TAMULY<sup>1</sup>, AND Y-T. KIM<sup>1</sup><sup>1</sup>University of Texas at Arlington, Arlington, TX**PS-7B-20-284** Studies on Silicon Stabilized Nano-sized alpha-Tricalcium Phosphate Based CementsP. KUMTA<sup>1</sup>, AND A. ROY<sup>1</sup><sup>1</sup>University of Pittsburgh, Pittsburgh, PA**PS-7B-20-285** The Role of Magnesium Substitution on the Properties and *In Vitro* Bioactivity of Brushite CementsP. KUMTA<sup>1</sup>, S. SINGH<sup>1</sup>, AND A. ROY<sup>1</sup><sup>1</sup>University of Pittsburgh, Pittsburgh, PA**PS-7B-20-286** Mechanical and Cellular Response to Biomineralization of Ovalbumin Scaffolds for Bone Tissue EngineeringK. T. SHEETS<sup>1</sup>, AND A. W. MORGAN<sup>1</sup><sup>1</sup>Virginia Tech, Blacksburg, VA**PS-7B-20-287** Structural Transition Induced by Mechanical Shear in a Novel Peptide-Amphiphile SystemK. MEGLEY<sup>1</sup>, W. SUH<sup>1</sup>, AND M. TIRRELL<sup>1</sup><sup>1</sup>UC Berkeley, Berkeley, CA**PS-7B-20-288** Tissue Density Culture in a GAG-based Microcapsules as a Foundation for Modular Tissue EngineeringR. T. ANNAMALAI<sup>1</sup>, D. R. ARMANT<sup>1</sup>, AND H. W. MATTHEW<sup>1</sup><sup>1</sup>Wayne State University, Detroit, MI**PS-7B-20-289** Vapor-Phase Nano-Textured Coating of Biocompatible Organic Films on Solid State SurfacesS. VIDYALA<sup>1</sup>, S. GOYAL<sup>2</sup>, Y-T. KIM<sup>1</sup>, AND S. M. IOBAL<sup>1</sup><sup>1</sup>University of Texas Arlington, Arlington, TX, <sup>2</sup>Life Technologies Corporation, Carlsbad, CA

**Track: Tissue Engineering \* – 7-2-1****Novel Biomaterials and Scaffolds – II**

Chairs: Jason Burdick, Seda Kizilel

Room 12A

**1:30PM OP-7-2-1A Cellular Behavior on a Novel Continuously Graded Scaffold That Mimics an Orthopaedic Interface**S. SAMAVEDI<sup>1</sup>, A. S. GOLDSTEIN<sup>1</sup>, S. A. GUELCHER<sup>2</sup>, AND A. W. MORGAN<sup>1</sup><sup>1</sup>Virginia Polytechnic Institute & State University, Blacksburg, VA, <sup>2</sup>Vanderbilt University, Nashville, TN**1:45PM OP-7-2-1B Electrospun Scaffolds with Depth-wise Chemical and Mechanical Gradients to Increase Cell Infiltration**H. G. SUNDARARAGHAVAN<sup>1</sup>, AND J. A. BURDICK<sup>1</sup><sup>1</sup>University of Pennsylvania, Philadelphia, PA**2:00PM OP-7-2-1C Oxygen Generating Biomaterials for Ischemic Tissue Salvage and Function**C. L. WARD<sup>1,2</sup>, B. T. CORONA<sup>1</sup>, J. J. YOO<sup>1</sup>, B. S. HARRISON<sup>1,2</sup>, AND G. J. CHRIST<sup>1,2</sup><sup>1</sup>Wake Forest University Health Sciences, Winston-Salem, NC, <sup>2</sup>School of Biomedical Engineering and Sciences, Winston-Salem, NC**2:15PM OP-7-2-1D Development of Fully Biodegradable Polymeric "Quantum Dots"**Y. ZHANG<sup>1</sup>, R. TRAN<sup>1</sup>, D. GYAWALI<sup>1</sup>, AND J. YANG<sup>1</sup><sup>1</sup>University of Texas at Arlington, Arlington, TX**2:30PM OP-7-2-1E Ruthenium Catalyzed Cross-Linking of Engineered Arterial Tissue**J. W. BJORK<sup>1</sup>, AND R. T. TRANQUILLO<sup>1</sup><sup>1</sup>University of Minnesota, Minneapolis, MN**2:45PM OP-7-2-1F Development of Synthetic Viruses for Tissue Regenerating Materials**S-W. LEE<sup>1,2</sup>, W. CHUNG<sup>1</sup>, AND S. YOO<sup>1</sup><sup>1</sup>University of California, Berkeley, Berkeley, CA, <sup>2</sup>Lawrence Berkeley National Laboratory, Berkeley, CA

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

**Track: Biomedical Imaging and Optics – 7-2-2****Molecular Imaging II – Synthesis and In Vitro Imaging**

Chairs: Anne Marie Broome, Andrew Tsourkas

Room 12B

**1:30PM OP-7-2-2A A Genetically Engineered Ratiometric Bioluminescent Sensor for Oxidative Stress**J. CZUPRYNA<sup>1</sup>, AND A. TSOURKAS<sup>1</sup><sup>1</sup>University of Pennsylvania, Philadelphia, PA**1:45PM OP-7-2-2B Ratiometric BiMolecular Beacons for the Sensitive Detection of RNA in Single Living Cells**X. ZHANG<sup>1</sup>, A. K. CHEN<sup>1</sup>, A. SHAH<sup>1</sup>, M. A. BEHLKE<sup>2</sup>, AND A. TSOURKAS<sup>1</sup><sup>1</sup>University of Pennsylvania, Philadelphia, PA, <sup>2</sup>Integrated DNA Technologies, Inc., Coralville, IA**2:00PM OP-7-2-2C A Novel Fluorogenic Probe for Imaging Endogenous Proteins in Living Cells**S. DUBLIN<sup>1</sup>, Y. ZHANG<sup>1</sup>, Z. ZHENG<sup>1</sup>, AND G. BAO<sup>1</sup><sup>1</sup>Georgia Institute of Technology, Atlanta, GA**2:15PM OP-7-2-2D Design of Reactive Fluorogenic Probes for Imaging Small Molecules**N. K. DEVARAJ<sup>1</sup>, S. HILDERBRAND<sup>1</sup>, AND R. WEISSLEDER<sup>1</sup><sup>1</sup>Massachusetts General Hospital, Boston, MA**2:30PM OP-7-2-2E Imaging Multiple Fluorophore Lifetimes with Diffuse Optical Tomography**R. NOTHDURFT<sup>1</sup>, M. BEREZIN<sup>1</sup>, S. ACHILEFU<sup>1</sup>, AND J. CULVER<sup>1</sup><sup>1</sup>Washington University School of Medicine, St. Louis, MO**2:45PM OP-7-2-2F Static SIMS Imaging Identification of Individual Cells in Mixed Phenotype Cultures**C. A. BARNES<sup>1</sup>, J. BRISON<sup>1</sup>, D. G. CASTNER<sup>1</sup>, AND B. D. RATNER<sup>1</sup><sup>1</sup>University of Washington, Seattle, WA**Track: Biomedical Imaging and Optics – 7-2-3****Imaging in Cancer Using Nanotechnology – II**

Chairs: Bahram Anvari, James Basilion

Room 19A

**1:30PM OP-7-2-3A MRI Tracking of Intracellular Delivery of Tumor-Targeting Nanoparticles Triggered by Molecular Interactions With ICAM-1**R. WONG<sup>1,2</sup>, X. CHEN<sup>1</sup>, T. LIU<sup>1,2</sup>, Y. A. YANG<sup>3</sup>, Y. WANG<sup>1,2</sup>, AND M. M. JIN<sup>1,2</sup><sup>1</sup>Cornell University, Ithaca, NY, <sup>2</sup>Cornell University - Weill Medical College, New York, NY, <sup>3</sup>Ocean Nanotech, LLC, Springdale, AR**1:45PM OP-7-2-3B Ultrasonic Evaluation of Tumor Response to VEGF Blockade using Size-Selected Microbubbles**S. R. SIRSI<sup>1</sup>, C. C. CHEN<sup>1</sup>, S. L. HERNANDEZ<sup>2</sup>, J. HUANG<sup>2</sup>, T. B. JOHUNG<sup>2</sup>, D. J. YAMASHIRO<sup>2</sup>, J. J. KANDEL<sup>2</sup>, S. HOMMA<sup>2</sup>, AND M. A. BORDEN<sup>2</sup><sup>1</sup>Columbia University, New York, NY, <sup>2</sup>Columbia University Medical Center, New York, NY**2:00PM OP-7-2-3C An Iodinated Nanoparticle Contrast Agent for Evaluating the Efficacy of Nano-Therapeutics**K. B. GHAGHADA<sup>1</sup>, R. BHAVANE<sup>1</sup>, M. SRIVASTAVA<sup>1</sup>, G. ESPINOSA<sup>1</sup>, AND A. ANNAPRAGADA<sup>1</sup><sup>1</sup>The University of Texas Health Science Center, Houston, TX**2:15PM OP-7-2-3D Development of Cancer Enzyme Triggered Fluorescent Nano-Contrast Agent**J. WANG<sup>1</sup>, S. BISWAS<sup>1</sup>, M. NANTZ<sup>1</sup>, S. ACHILEFU<sup>2</sup>, AND K. A. KANG<sup>1</sup><sup>1</sup>University of Louisville, Louisville, KY, <sup>2</sup>Washington University, St. Louis, MO**2:30PM OP-7-2-3E In Vitro Optical Imaging of HeLa Cancer Cells with BSA-coated Polymeric Nanocapsules Containing ICG**B. JUNG<sup>1</sup>, AND B. ANVARI<sup>1</sup><sup>1</sup>University of California, Riverside, Riverside, CA**2:45PM OP-7-2-3F Mesoporous Silicon Magnetic Nanoconstructs as superior MRI Contrast Agents**R. SETHI<sup>1</sup>, J. ANANTA<sup>1</sup>, X. LIU<sup>2</sup>, J. BANKSON<sup>3</sup>, M. FERRARI<sup>2</sup>, L. WILSON<sup>1</sup>, AND P. DECUZZI<sup>2</sup><sup>1</sup>Rice University, Houston, TX, <sup>2</sup>University of Texas - HSCH, Houston, TX, <sup>3</sup>MD Anderson Cancer Center, Houston, TX**Track: Neural Engineering – 7-2-4****Motor Neural Prosthetics**

Chairs: Kenneth Gustafson, Paul Yoo

Room 19B

**1:30PM OP-7-2-4A A Neuroprosthesis for Restoring Arm and Hand Function in Individuals with C1-C4 Spinal Cord Injury**R. KIRSCH<sup>1</sup><sup>1</sup>Case Western Reserve University, Cleveland, OH

**1:45PM OP-7-2-4B** Decoding Simple Grasp Movements from the Human Subdural ElectrooculogramS. ACHARYA<sup>1</sup>, M. S. FIFER<sup>1</sup>, H. L. BENZ<sup>1</sup>, N. E. CRONE<sup>1</sup>, AND N. V. THAKOR<sup>1</sup>  
<sup>1</sup>Johns Hopkins University, Baltimore, MD**2:00PM OP-7-2-4C** The Target Achievement Control Test: Evaluating real-time myoelectric pattern recognition controlA. M. SIMON<sup>1</sup>, L. J. HARGROVE<sup>1,2</sup>, B. A. LOCK<sup>1</sup>, AND T. A. KUIKEN<sup>1,2</sup>  
<sup>1</sup>Rehabilitation Institute of Chicago, Chicago, IL, <sup>2</sup>Northwestern University, Chicago, IL**2:15PM OP-7-2-4D** Peripheral Nerve Electrodes in Clinical ApplicationsD. J. TYLER<sup>1</sup>  
<sup>1</sup>Case Western Reserve University, Cleveland, OH**2:30PM OP-7-2-4E** Differential Activity of Pudendal Nerve Afferents During MicturitionP. B. YOO<sup>1</sup>, AND W. M. GRILL<sup>1</sup>  
<sup>1</sup>Duke University, Durham, NC**2:45PM OP-7-2-4F** Functional Stimulation of Peripheral Motor Axons Via Neuroregenerative Sieve MicroelectrodesM. R. MACEWAN<sup>1</sup>, E. ZELLMER<sup>1</sup>, D. SIEWE<sup>1</sup>, J. WHEELER<sup>1</sup>, S. SAKIYAMA-ELBERT<sup>1</sup>, AND D. MORAN<sup>1</sup>  
<sup>1</sup>Washington University, Saint Louis, MO**Track: Cellular and Molecular Engineering – 7-2-5 Molecular Engineering – I**Chairs: Helim Aranda-Espinoza, Laura Segatori  
Room 18A**1:30PM OP-7-2-5A** Characterization and Informed Design of Downregulating Epidermal Growth Factor Receptor AntibodiesJ. B. SPANGLER<sup>1</sup>, AND K. D. WITTRUP<sup>1</sup>  
<sup>1</sup>Massachusetts Institute of Technology, Cambridge, MA**1:45PM OP-7-2-5B** Engineering Human Arginase as a Novel Chemotherapeutic Agent for the Treatment of Hepatocellular CarcinomaE. STONE<sup>1</sup>, L. CHANTRANUPONG<sup>1</sup>, C. GONZALES<sup>1</sup>, AND G. GEORGIU<sup>1</sup>  
<sup>1</sup>University of Texas at Austin, Austin, TX**2:00PM OP-7-2-5C** Investigating the Aggregation, Structure, and Activity of DNA Binding bZip Peptide AmphiphilesR. MARULLO<sup>1</sup>, AND M. TIRRELL<sup>2</sup>  
<sup>1</sup>University of California, Santa Barbara, Berkeley, CA, <sup>2</sup>University of California, Berkeley, Berkeley, CA**2:15PM OP-7-2-5D** Engineering High Affinity Knottin Peptides Targeting Tumor Marker CAIX for Cancer ImagingS. J. MOORE<sup>1</sup>, AND J. R. COCHRAN<sup>1</sup>  
<sup>1</sup>Stanford University, Stanford, CA**2:30PM OP-7-2-5E** Modification of Adeno-Associated Virus Capsid Conformational Change Behavior Using Error-Prone PCRM. A. MUSICK<sup>1,2</sup>, K. I. MCCONNELL<sup>1</sup>, C. CHEN<sup>1</sup>, AND J. SUH<sup>1</sup>  
<sup>1</sup>Rice University, Houston, TX, <sup>2</sup>Baylor College of Medicine, Houston, TX**2:45PM OP-7-2-5F** Micropatterning of Aptamer Beacons to Create Cytokine-Sensing SurfacesN. TULEUOVA<sup>1,2</sup>, J. SEO<sup>1</sup>, E. RAMANULOV<sup>2</sup>, AND A. REVZIN<sup>1</sup>  
<sup>1</sup>University of California, Davis, CA, <sup>2</sup>National Center for Biotechnology, Astana, Kazakhstan**Track: Cellular and Molecular Engineering – 7-2-6****Cell Mechanics**Chairs: William Hancock, David Odde  
Room 18B**1:30PM OP-7-2-6A** Adipose Progenitor Cells Promote Mammary Tumor Stiffness by Altering Fibronectin MechanicsE. M. CHANDLER<sup>1</sup>, M. SAUNDERS<sup>1</sup>, D. GOURDON<sup>1</sup>, AND C. FISCHBACH<sup>1</sup>  
<sup>1</sup>Cornell University, Ithaca, NY**1:45PM OP-7-2-6B** Cytoskeletal Fluidization Potentiates cell Realignment During Uniaxial Cyclic Cell StretchingA. L. IORDAN<sup>1</sup>, R. KRISHNAN<sup>2</sup>, N. MIZRAHI<sup>2</sup>, K. RAJENDRAN<sup>2</sup>, A. MARINKOVIC<sup>2</sup>, J. P. BUTLER<sup>2</sup>, J. J. FREDBERG<sup>2</sup>, AND D. STAMENOVIC<sup>1</sup>  
<sup>1</sup>Boston University, Boston, MA, <sup>2</sup>Harvard School of Public Health, Boston, MA**2:00PM OP-7-2-6C** Effect of DDR Receptors on Mechanical Properties of Extracellular MatrixS. M. TABBAA<sup>1</sup>, A. BLISSETT<sup>1</sup>, L. SIVAKUMAR<sup>1</sup>, M. STEVENSON<sup>1</sup>, A. MORSS<sup>1</sup>, G. P. LAFYATIS<sup>1</sup>, K. GOOCH<sup>1</sup>, AND G. AGARWAL<sup>1</sup>  
<sup>1</sup>The Ohio State University, Columbus, OH**2:15PM OP-7-2-6AD** Quantized Velocities of Microtubule-Based Motors in a Living Cell and the Effect of Cargo SizeJ. A. LAIB<sup>1</sup>, B. DHAMANKAR<sup>1</sup>, AND W. GUILFORD<sup>1</sup>  
<sup>1</sup>University of Virginia, Charlottesville, VA**2:30PM OP-7-2-6E** The Role of Nuclear-Cytoskeletal Coupling in Intracellular Force TransmissionM. L. LOMBARDI<sup>1</sup>, D. JAALOUK<sup>1</sup>, C. SHANAHAN<sup>2</sup>, K. ROUX<sup>3</sup>, AND J. LAMMERDING<sup>1</sup>  
<sup>1</sup>Brigham and Women's Hospital/Harvard Medical School, Cambridge, MA, <sup>2</sup>King's College London, London, United Kingdom, <sup>3</sup>University of Florida, Gainesville, FL**2:45PM OP-7-2-6F** 3D Multiscale Molecular Model of Muscle Contraction and RelaxationS. M. MIJALOVICH<sup>1,2</sup>, O. KAYSER-HERALD<sup>1</sup>, R. J. GILBERT<sup>2</sup>, AND M. A. GEEVES<sup>3</sup>  
<sup>1</sup>Harvard School of Public Health, Boston, MA, <sup>2</sup>Caritas St. Elizabeth's Medical Center, Boston, MA, <sup>3</sup>University of Kent, Canterbury, Kent, United Kingdom**Track: Cardiovascular Engineering - 7-2-7****Cardiac Electrophysiology**Chairs: Elizabeth Lipke, Abhijit Patwardhan  
Room 18C**1:30PM OP-7-2-7A** Electrical Coupling of Ventricular Myocytes is Dependent on Cx43 Density and Myofibril OrganizationM. L. MCCAIN<sup>1,2</sup>, T. DESPLANTEZ<sup>2</sup>, N. A. GEISSE<sup>1</sup>, H. HINNEN<sup>2</sup>, A. G. KLEBER<sup>2</sup>, AND K. K. PARKER<sup>1,3</sup><sup>1</sup>Disease Biophysics Group, School of Engineering and Applied Sciences, Harvard University, Cambridge, MA, <sup>2</sup>Department of Physiology, University of Bern, Bern, Switzerland, <sup>3</sup>Wyss Institute for Biologically Inspired Engineering, Harvard University, Boston, MA**1:45PM OP-7-2-7B** Engineering Cardiac Form and Function through Cyclic Stretch and Extracellular Matrix PatterningM. L. MCCAIN<sup>1,2</sup>, M. D. BRIGHAM<sup>1,2</sup>, A. W. FEINBERG<sup>1,2</sup>, P. W. ALFORD<sup>1,2</sup>, S. P. SHEEHY<sup>1,2</sup>, A. GROSBERG<sup>1,2</sup>, J. A. GOSS<sup>1,2</sup>, AND K. K. PARKER<sup>1,2</sup><sup>1</sup>Disease Biophysics Group, School of Engineering and Applied Sciences, Harvard University, Cambridge, MA, <sup>2</sup>Wyss Institute for Biologically Inspired Engineering, Harvard University, Boston, MA**2:00PM OP-7-2-7C-** Embryonic Stem Cell-Derived Cardiomyocytes Require Supporting Cells to Form 3D Functional MyocardiumB. LIAU<sup>1</sup>, N. CHRISTOFOROU<sup>1</sup>, K. LEONG<sup>1</sup>, AND N. BURSAC<sup>1</sup>  
<sup>1</sup>Duke University, Durham, NC



**2:15PM OP-7-2-7D** Optogenetic Control of Human Pluripotent Stem Cell-Derived CardiomyocytesO. ABILEZ<sup>1</sup>, J. J. BAUGH<sup>1</sup>, M. L. GORREPATI<sup>1</sup>, C. LEE-MESSER<sup>1</sup>, M. HUANG<sup>1</sup>, R. PRAKASH<sup>1</sup>, K. D. WILSON<sup>1</sup>, F. JIA<sup>1</sup>, J. YU<sup>1</sup>, J. C. WU<sup>1</sup>, K. DEISSEROTH<sup>1</sup>, AND C. K. ZARINS<sup>1</sup><sup>1</sup>Stanford University, Stanford, CA**2:30PM OP-7-2-7E** Simultaneous Optical Mapping of Transmembrane Potential and Wall Motion in Isolated, Perfused HeartsE. B. BOURGEOIS<sup>1</sup>, A. D. BACHTEL<sup>1</sup>, G. P. WALCOTT<sup>1</sup>, AND J. M. ROGERS<sup>1</sup><sup>1</sup>University of Alabama at Birmingham, Birmingham, AL**2:45PM OP-7-2-7F** Role of iPLA2 Activation in the Response of the Diabetic Rat Heart to Acute IschemiaP. RAHNEMA<sup>1</sup>, Y. SHIMONI<sup>1</sup>, AND A. NYGREN<sup>1</sup><sup>1</sup>University of Calgary, Calgary, Alberta, Canada**Track: Cardiovascular Engineering - 7-2-8****Cardiovascular Fluid Dynamics - II**

Chairs: Jonathan Butcher, Alison Marsden

Room 18D

**1:30PM OP-7-2-8A** Lymph Transport in Rat Mesenteric Lymphatics Experiencing Edemagenic StressE. RAHBAR<sup>1</sup>, T. AKL<sup>1</sup>, D. C. ZAWIEJA<sup>2</sup>, G. L. COTE<sup>1</sup>, AND J. E. MOORE JR.<sup>1</sup><sup>1</sup>Texas A&M University, College Station, TX, <sup>2</sup>Texas A&M Health Science Center, Temple, TX**1:45PM OP-7-2-8B** Changes in Wall Shear Stress Generated by Outflow Tract Banding in the Hearts of Chick EmbryosA. LIU<sup>1</sup>, A. TROYER<sup>1</sup>, X. YIN<sup>1</sup>, Z. MA<sup>1</sup>, A. NICKERSON<sup>1</sup>, R. WANG<sup>1</sup>, K. THORNBURG<sup>1</sup>, AND S. RUGONYI<sup>1</sup><sup>1</sup>Oregon Health & Science University, Portland, OR**2:00PM OP-7-2-8C** Hemodynamic Patterning of Avian Embryonic HeartH. C. YALCIN<sup>1</sup>, A. SHEKHAR<sup>1</sup>, K. BHARADWAJ<sup>1</sup>, AND J. T. BUTCHER<sup>1</sup><sup>1</sup>Cornell University, Ithaca, NY**2:15PM OP-7-2-8D** Characterization of the Outflow Tract-Aortic Arch Angle During Embryonic Development in the ChickW. J. KOWALSKI<sup>1</sup>, N. C. TESLOVICH<sup>1</sup>, O. DUR<sup>1</sup>, B. B. KELLER<sup>2</sup>, AND K. PEKKAN<sup>1</sup><sup>1</sup>Carnegie Mellon University, Pittsburgh, PA, <sup>2</sup>Cardiovascular Innovation Institute, University of Louisville, Louisville, KY**2:30PM OP-7-2-8E** Achieving an Optimal Hepatic Flow Distribution Via a Customized Y-graft Design for the Fontan SurgeryA. L. MARSDEN<sup>1</sup>, W. YANG<sup>1</sup>, I. VIGNON-CLEMENTEL<sup>2</sup>, AND J. A. FEINSTEIN<sup>3</sup><sup>1</sup>UCSD, La Jolla, CA, <sup>2</sup>INRIA, Cedex, France, <sup>3</sup>Stanford University, Palo Alto, CA**2:45PM OP-7-2-8F** A Lumped Parameter Model for the Measurement of O<sub>2</sub> and CO<sub>2</sub> Concentration in Congenital Heart DefectsW. J. KOWALSKI<sup>1</sup>, O. DUR<sup>1</sup>, AND K. PEKKAN<sup>1</sup><sup>1</sup>Carnegie Mellon University, Pittsburgh, PA**Track: Orthopedic and Rehabilitation Engineering – 7-2-9****Orthopedic Biomaterials**

Chairs: Ed Botchwey, Kurt Kasper, Helen Lu

Room 17A

**1:30PM OP-7-2-9A** Bacteriocidal Ultrasound Therapy is Enhanced with Antibacterial NanomaterialsJ. T. SEIL<sup>1</sup>, AND T. J. WEBSTER<sup>1</sup><sup>1</sup>Brown University, Providence, RI**1:45PM OP-7-2-9B** Development and Optimization of a Biodegradable Bone Cement for Clinical ApplicationsA. HENSLEE<sup>1</sup>, D-H. GWAK<sup>1</sup>, A. MIKOS<sup>1</sup>, AND F. KASPER<sup>1</sup><sup>1</sup>Rice University, Houston, TX**2:00PM OP-7-2-9C** Keratin Biomaterials with BMPs Promote Bone Regeneration and Gap Bridging in a Critical-size DefectR. DE GUZMAN<sup>1</sup>, J. SAUL<sup>1,2</sup>, M. ELLENBURG<sup>1</sup>, T. SMITH<sup>1</sup>, AND M. VAN DYKE<sup>1</sup><sup>1</sup>Wake Forest University Health Sciences, Winston-Salem, NC, <sup>2</sup>Virginia Tech - Wake Forest University, Winston-Salem, NC**2:15PM OP-7-2-9D** A Novel Injectable Porous Hydrogel Composite Scaffold for Bone Tissue EngineeringP. NAIR<sup>1</sup>, D. GYAWALI<sup>1</sup>, R. TRAN<sup>1</sup>, AND J. YANG<sup>1</sup><sup>1</sup>University of Texas at Arlington, Arlington, TX**2:30PM OP-7-2-9E** Development of Hybrid Scaffolds for Bone Tissue EngineeringY. KANG<sup>1</sup>, A. SCULLY<sup>2</sup>, D. YOUNG<sup>1</sup>, S. KIM<sup>1</sup>, H. TSAO<sup>1</sup>, AND Y. YANG<sup>1,2</sup><sup>1</sup>University of Texas Health Science Center at Houston, Houston, TX, <sup>2</sup>Rice University, Houston, TX**2:45PM OP-7-2-9F** Chondrocyte Response in Hydrogel-Ceramic Scaffolds for Osteochondral Interface RegenerationM. K. BOUSHELL<sup>1</sup>, N. T. KHANARIAN<sup>1</sup>, AND H. H. LU<sup>1</sup><sup>1</sup>Columbia University, New York, NY**Track: Systems Biology, Bioinformatics and Computational Biology – 7-2-10****Signals and Networks in Cancer and Disease – I**

Chairs: Markus Covert, Melissa Kemp

Room 17B

**1:30PM OP-7-2-10A** Global Transcriptomics Analysis Reveals Gene-pair Decision Rules to Differentiate Major Brain DiseasesJ. SUNG<sup>1</sup>, P-J. KIM<sup>1</sup>, D. GEMAN<sup>2</sup>, AND N. PRICE<sup>1</sup><sup>1</sup>University of Illinois at Urbana-Champaign, Urbana, IL, <sup>2</sup>Johns Hopkins University, Baltimore, MD**1:45PM OP-7-2-10B** Bcl-2 and XIAP Inhibit Apoptosis by Modulating Intrinsic Variations in the Mitochondrial PathwayS. RAYCHAUDHURI<sup>1</sup>, A. NAIR<sup>1</sup>, J. SKOMMER<sup>2</sup>, AND T. BRITTAIN<sup>2</sup><sup>1</sup>University of California Davis, Davis, CA, <sup>2</sup>The University of Auckland, Auckland, New Zealand**2:00PM OP-7-2-10C** Multiplexed Cell Signaling Data for Constrained Fuzzy Logic ModelingD. C. CLARKE<sup>1</sup>, AND D. A. LAUFFENBURGER<sup>1</sup><sup>1</sup>Massachusetts Institute of Technology, Cambridge, MA**2:15PM OP-7-2-10D** A Single-Cell TGF R-JUND Dichotomy and Its Role in Basal-like Breast CancerC-C. WANG<sup>1</sup>, AND K. JANES<sup>1</sup><sup>1</sup>University of Virginia, Charlottesville, VA**2:30PM OP-7-2-10E** Coupled Signaling Loops are Responsible for Generating Synchronized Oscillations in BMP/TGF AxesB. GRABIAS<sup>1</sup>, AND K. KONSTANTOPOULOS<sup>1</sup><sup>1</sup>Johns Hopkins University, Baltimore, MD**2:45PM OP-7-2-10F** Simulations of Competing Neuroprotective and Vascular Effects of VEGF in ALSY. L. HASHAMBHOY<sup>1</sup>, AND F. MAC GABHANN<sup>1</sup><sup>1</sup>Johns Hopkins University, Baltimore, MD

**Track: Devices: Nano to Micro – 7-2-11****Medical Diagnostics: Nano to Micro Devices – I**

Chairs: Michelle Khine, John Zhang  
Room 16A

**1:30PM OP-7-2-11A** Microfluidic ELISA and Cell Immunophenotyping for Ocular Diagnostics

J. V. GREEN<sup>1</sup>, D. SUN<sup>2</sup>, A. HAFEZI-MOGHADAM<sup>2</sup>, K. LASHKARI<sup>3</sup>, AND S. K. MURTHY<sup>1</sup>  
<sup>1</sup>Northeastern University, Boston, MA, <sup>2</sup>Massachusetts Eye and Ear Infirmary and Harvard Medical School, Boston, MA, <sup>3</sup>Schepens Eye Research Institute, Boston, MA

**1:45PM OP-7-2-11B** Functionalized Ultra-Nanocrystalline Diamond (UNCD) Films for Biosensing

A. D. RADADIA<sup>1</sup>, Y-S. LIU<sup>1</sup>, N. PRIVOROTSKAYA<sup>1</sup>, C. STAVIS<sup>2</sup>, H. ZENG<sup>3</sup>, J. A. CARLISLE<sup>3</sup>, R. J. HAMERS<sup>2</sup>, W. P. KING<sup>1</sup>, AND R. BASHIR<sup>1</sup>  
<sup>1</sup>University of Illinois, Urbana, IL, <sup>2</sup>University of Wisconsin - Madison, Madison, WI, <sup>3</sup>Advanced Diamond Technologies, Inc., Romeoville, IL

**2:00PM OP-7-2-11C** Phosphopeptides Enrichment on Functionalized Nanoporous Silica Thin Films for Cancer Early Diagnostics

Y. HU<sup>1</sup>, Y. PENG<sup>1</sup>, L. BROUSSEAU<sup>1</sup>, AND M. FERRARI<sup>1</sup>  
<sup>1</sup>The University of Texas Health Science Center at Houston, Houston, TX

**2:15PM OP-7-2-11D** An Optofluidic Platform for Characterizing Mechanical Properties of Metastatic Cancer Cells

M. MAK<sup>1</sup>, C. REINHART-KING<sup>1</sup>, AND D. ERICKSON<sup>1</sup>  
<sup>1</sup>Cornell University, Ithaca, NY

**2:30PM OP-7-2-11E** Parylene Peel-Strips for Multiplexed Aptamers Separation and Recovery

C. P. TAN<sup>1</sup>, K. E. CENICCOLA<sup>1</sup>, K. SZETO<sup>1</sup>, D. M. LIN<sup>1</sup>, AND H. G. CRAIGHEAD<sup>1</sup>  
<sup>1</sup>Cornell University, Ithaca, NY

**2:45PM OP-7-2-11F** Paper-based ELISA

C-M. CHENG<sup>1</sup>, X. LIU<sup>1</sup>, K. MIRICA<sup>1</sup>, C. MACE<sup>1</sup>, AND G. WHITESIDES<sup>1</sup>  
<sup>1</sup>Harvard University, Cambridge, MA

**Track: Devices: Nano to Micro – 7-2-12****Nano to Micro: Fluidic Technologies - I**

Chairs: Samir Iqbal, Christine Trinkle  
Room 16B

**1:30PM OP-7-2-12A** - Electrical Measurement and Characterization of PBS-in-ionic Liquid Droplets in a Microfluidic Device

W-J. CHANG<sup>1</sup>, E. SALM<sup>1,2</sup>, N. N. WATKINS<sup>1,2</sup>, Y-S. JIN<sup>2,3</sup>, AND R. BASHIR<sup>1,2</sup>  
<sup>1</sup>Micro and Nanotechnology Laboratory, Urbana, IL, <sup>2</sup>University of Illinois at Urbana-Champaign, Urbana, IL, <sup>3</sup>Institute for Genomic Biology, Urbana, IL

**1:45PM OP-7-2-12B** - Study of Surface Roughness on Affinity-Based Cell Capture in Microfluidic Devices

B. WANG<sup>1</sup>, P. KUMNORKAEW<sup>1</sup>, M. WOLFE<sup>1</sup>, A. WELDON<sup>1</sup>, C. TIBALDI<sup>1</sup>, J. GILCHRIST<sup>2</sup>, AND X. CHENG<sup>1</sup>  
<sup>1</sup>Lehigh University, Bethlehem, PA, <sup>2</sup>Lehigh University, Bethlehem, PA

**2:00PM OP-7-2-12C** - Microfluidic Zone Refining for Biosample Preparation

P. KASHANI<sup>1</sup>, AND P. KAVEHPOUR<sup>1</sup>  
<sup>1</sup>UCLA, Los Angeles, CA

**2:15PM OP-7-2-12D** - Isolation of Circulating Cancer Cells From Dilute Whole Blood Samples Using Contactless Dielectrophoresis

M. B. SANO<sup>1</sup>, E. HENSLEE<sup>1</sup>, H. SHAFIEE<sup>1</sup>, AND R. V. DAVALOS<sup>1</sup>  
<sup>1</sup>Virginia Tech, Blacksburg, VA

**2:30PM OP-7-2-12E** Simple Particle-Induced Transverse Mass Transport at High Flow Rates

H. AMINI<sup>1,2</sup>, E. SOLLIER<sup>1,2</sup>, AND D. DI CARLO<sup>1,2</sup>  
<sup>1</sup>University of California, Los Angeles, Los Angeles, CA, <sup>2</sup>California NanoSystems Institute, Los Angeles, CA

**2:45PM OP-7-2-12F** 3D Tumor Spheroid Model Using a Perfused Array of Spherical Microcavities

S. AGASTINI<sup>1</sup>, U-B. T. GIANG<sup>2</sup>, L. DELOUISE<sup>2</sup>, AND M. KING<sup>1</sup>  
<sup>1</sup>Cornell University, Ithaca, NY, <sup>2</sup>University of Rochester, Rochester, NY

**Track: Drug Delivery Systems\* – 7-2-13****Nucleic Acid Delivery – II**

Chairs: Michelle Dawson, Craig Duvall  
Room 14

**1:30PM OP-7-2-13A** Nanoparticle-mediated p53 Gene Delivery for Tumor Inhibition

B. SHARMA<sup>1</sup>, W. MA<sup>2</sup>, J. PANYAM<sup>3</sup>, I. ADJEI<sup>1</sup>, S. DIMITRIJEVIC<sup>1</sup>, AND V. LABHASETWAR<sup>1</sup>  
<sup>1</sup>Lerner Research Institute, Cleveland Clinic, Cleveland, OH, <sup>2</sup>Moore's Cancer Center, University of California San Diego, La Jolla, CA, <sup>3</sup>University of Minnesota, College of Pharmacy, Minneapolis, MN

**1:45PM OP-7-2-13B** Treatment of Ovarian Cancer With Tumor-homing siRNA Nanocomplexes

Y. REN<sup>1</sup>, A. AGRAWAL<sup>1</sup>, G. VON MALTZAHN<sup>1</sup>, V. FOGAL<sup>2</sup>, H. CHEUNG<sup>3</sup>, E. RUOSLAHTI<sup>2</sup>, W. C. HAHN<sup>2</sup>, AND S. N. BHATIA<sup>4,5</sup>  
<sup>1</sup>Massachusetts Institute of Technology, Cambridge, MA, <sup>2</sup>Burnham Institute for Medical Research, Santa Barbara, CA, <sup>3</sup>Dana-Farber Cancer Institute/Broad Institute/BWH, Cambridge, MA, <sup>4</sup>MIT/HST/BWH, Cambridge, MA, <sup>5</sup>HHMI, Cambridge, MA

**2:00PM OP-7-2-13C** Effect of Nanoparticle Conjugation on Gene Silencing by RNA Interference

N. SINGH<sup>1</sup>, A. AGRAWAL<sup>1</sup>, A. K. LEUNG<sup>1</sup>, P. A. SHARP<sup>1</sup>, AND S. N. BHATIA<sup>1,2</sup>  
<sup>1</sup>MIT, Cambridge, MA, <sup>2</sup>Howard Hughes Medical Institute, Cambridge, MA

**2:15PM OP-7-2-13D** Antisense Silver Nanocomposites for Photoactivated Gene Silencing

P. K. BROWN<sup>1</sup>, A. T. QURESHI<sup>1</sup>, D. J. HAYES<sup>1</sup>, AND W. T. MONROE<sup>1</sup>  
<sup>1</sup>Louisiana State University, Baton Rouge, LA

**2:30PM OP-7-2-13E** Polybasic 2-(diethylaminoethyl) Methacrylate Nanogels and Their Application in Oral siRNA dDelivery

W. B. LIECHTY<sup>1</sup>, AND N. A. PEPPAS<sup>1</sup>  
<sup>1</sup>The University of Texas at Austin, Austin, TX

**2:45PM OP-7-2-13F** Orally Delivered Thioketal-nanoparticles Loaded With siRNA Target Reactive Oxygen Species and Inhibit Gene Expression in the Intestines

D. S. WILSON<sup>1</sup>, G. DALMASSO<sup>2</sup>, D. MERLIN<sup>2</sup>, AND N. MURTHY<sup>3</sup>  
<sup>1</sup>Georgia Tech, Atlanta, GA, <sup>2</sup>Emory University, Atlanta, GA, <sup>3</sup>Georgia Tech, Atlanta, GA

\* Drug Delivery Systems Track is sponsored by Acta Biomaterialia

**Track: New Frontiers in Bioengineering - 7-2-14****Biological Engineering in Cancer**

Chairs: Celeste Nelson, Cynthia Reinhardt-King  
Room 15

**1:30PM OP-7-2-14A** Slimy Forces: The Glycocalyx Controls Integrin Perception of the Extracellular Matrix

M. J. PASZEK<sup>1</sup>, C. DUFORT<sup>1</sup>, J. LAKINS<sup>1</sup>, J. HUDAK<sup>2</sup>, C. R. BERTOZZI<sup>2,3</sup>, D. A. HAMMER<sup>4</sup>, AND V. M. WEAVER<sup>1</sup>  
<sup>1</sup>University of California, San Francisco, San Francisco, CA, <sup>2</sup>University of California, Berkeley, Berkeley, CA, <sup>3</sup>Lawrence Berkeley National Laboratory, Berkeley, CA, <sup>4</sup>University of Pennsylvania, Philadelphia, PA

**1:45PM OP-7-2-14B** Spatial Regulation of Host-tumor Cell InteractionsE. BOGHAERT<sup>1</sup>, AND C. M. NELSON<sup>1</sup><sup>1</sup>Princeton University, Princeton, NJ**2:00PM OP-7-2-14C** - Invading Tumor Cells Take Advantage of Interstitial Flow-induced Matrix Priming by FibroblastsA. C. SHIEH<sup>1</sup>, H. A. ROZANSKY<sup>1</sup>, M. SENEVIRATNE<sup>1</sup>, AND M. A. SWARTZ<sup>1</sup><sup>1</sup>Ecole Polytechnique Federale de Lausanne, Lausanne, Vaud, Switzerland**2:15PM OP-7-2-14D** The Role of Mena Invasive Isoforms in Escape from EGFR InhibitionS. K. ALFORD<sup>1</sup>, E. BATCHELDER<sup>2</sup>, D. YARAR<sup>2</sup>, F. B. GERTLER<sup>1</sup>, AND D. A. LAUFFENBURGER<sup>1</sup><sup>1</sup>MIT, Cambridge, MA, <sup>2</sup>Whitehead Institute, Cambridge, MA**2:30PM OP-7-2-14E** Isolation of Circulating Tumor Cells from Cancer Patients using a Microfluidic Vortex GeneratorS. L. STOTT<sup>1</sup>, C-H. HSU<sup>1</sup>, D. T. MIYAMOTO<sup>1</sup>, S. M. ROTHENBERG<sup>1</sup>, S. NAGRATH<sup>1</sup>, R. J. LEE<sup>1</sup>, L. V. SEQUIST<sup>1</sup>, S. MAHESWARAN<sup>1</sup>, D. A. HABER<sup>1</sup>, AND M. TONER<sup>1</sup><sup>1</sup>Massachusetts General Hospital, Charlestown, MA**2:45PM OP-7-2-14F** Engineering Growth Factor Ligands as Cancer Diagnostics and TherapeuticsN. PAPO<sup>1</sup>, D. S. JONES<sup>1</sup>, A. P. SILVERMAN<sup>1</sup>, AND J. R. COCHRAN<sup>1</sup><sup>1</sup>Stanford University, Stanford, CA**Track:Tissue Engineering \* – 7-2-15****Nano- and Micro-Engineering in Tissue Engineering – II**

Chairs: Zach Hilt, Sihong Wang

Ballroom E

**1:30PM OP-7-2-15A** - 3D *In Vitro* Perfused Human Capillaries for Tissue EngineeringM. L. MOYA<sup>1</sup>, Y-H. HSU<sup>1</sup>, C. C. HUGHES<sup>1</sup>, A. P. LEE<sup>1</sup>, AND S. C. GEORGE<sup>1</sup><sup>1</sup>University of California, Irvine, Irvine, CA**1:45PM OP-7-2-15B** - Micro-patterned Substrates for Cardiac Tissue EngineeringS-K. PARK<sup>1</sup>, H-D. PARK<sup>1</sup>, K. NA<sup>1</sup>, S. YANG<sup>1</sup>, E-S. YOON<sup>1</sup>, AND J. KIM<sup>1</sup><sup>1</sup>Nano-Bio Center, Korea Institute of Science and Technology, Seoul, Korea, Republic of**2:00PM OP-7-2-15C** - Capillary Network Formation and Integration within Perfused Microfluidic Poly(ethylene glycol) hydrogelsM. P. CUCHIARA<sup>1</sup>, AND J. L. WEST<sup>1</sup><sup>1</sup>Rice University, Houston, TX**2:15PM OP-7-2-15D** - Endothelial Progenitor Cell Migration is Directed by Gradients of SDF and VEGFE. M. ANDERSON<sup>1,2</sup>, D. HUH<sup>2</sup>, AND D. J. MOONEY<sup>1,2</sup><sup>1</sup>Harvard University, Cambridge, MA, <sup>2</sup>Wyss Institute, Boston, MA**2:30PM OP-7-2-15E** - Tuning Directed Cell Motility on Micropatterns through Pattern Geometry and Signal AlterationsK. KUSHIRO<sup>1</sup>, S. CHANG<sup>1</sup>, AND A. R. ASTHAGIRI<sup>1</sup><sup>1</sup>California Institute of Technology, Pasadena, CA**2:45PM OP-7-2-15F** - Efficient Myogenic Commitment of hESC-derived Mesenchymal Cells on Biomimetic Materials Replicating Myoblast TopographyN. S-Y. HWANG<sup>1</sup>, S-G. IM<sup>1</sup>, R. S. LANGER<sup>1</sup>, AND D. G. ANDERSON<sup>1</sup><sup>1</sup>Massachusetts Institute of Technology, Cambridge, MA

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

**Track:Tissue Engineering \* – 7-2-16****Cardiovascular Tissue Engineering – I**

Chairs: Andrea Gobin, Jianjun Guan

Ballroom F

**1:30PM OP-7-2-16A** Mimicry of Endogenous Microvascular Structures in Poly(ethylene glycol) HydrogelsJ. HOFFMANN<sup>1</sup>, J. CULVER<sup>2</sup>, M. DICKINSON<sup>2</sup>, AND J. WEST<sup>1</sup><sup>1</sup>Rice University, Houston, TX, <sup>2</sup>Baylor College of Medicine, Houston, TX**1:45PM OP-7-2-16B** *In Vivo* Imaging of Microvascular Network Development in a Tissue Engineered ConstructG. GRUIONU<sup>1</sup>, Z. GALIS<sup>1</sup>, T. SECOMB<sup>2</sup>, AND J. B. HOYING<sup>3</sup><sup>1</sup>Indiana University School of Medicine, Indianapolis, IN, <sup>2</sup>University of Arizona, Tucson, AZ,<sup>3</sup>University of Louisville, Louisville, KY**2:00PM OP-7-2-16C** Engineering the Synergy Between Growth Factors and Integrins for AngiogenesisM. M. MARTINO<sup>1</sup>, AND J. A. HUBBELL<sup>1</sup><sup>1</sup>Swiss Federal Institute of Engineering, Lausanne, VD, Switzerland**2:15PM OP-7-2-16D** Compliance-Matched Arterial Vein Grafts via an External, Electrospun, Biodegradable Elastomeric WrapQ. WANG<sup>1,2</sup>, Y. HONG<sup>1,2</sup>, W. HE<sup>1,2</sup>, D. W. CHEW<sup>1,2</sup>, J. RENDEMONTI<sup>1,2</sup>, W. R. WAGNER<sup>1,2</sup>, AND D. A. VORP<sup>1,2</sup><sup>1</sup>University of Pittsburgh, Pittsburgh, PA, <sup>2</sup>McGowan Institute for Regenerative Medicine, Pittsburgh, PA**2:30PM OP-7-2-16E** Engineered Arteries Developed in a Multi-graft Flow-stretch Bioreactor with Noninvasive MonitoringZ. SYEDAIN<sup>1</sup>, L. MEIER<sup>1</sup>, A. LEE<sup>1</sup>, AND R. TRANQUILLO<sup>1</sup><sup>1</sup>University of Minnesota, Minneapolis, MN**2:45PM OP-7-2-16F** Cellular and Biomechanical Analysis of an *In Vitro* Cultured Small Diameter Blood VesselP. S. MCFETRIDGE<sup>1</sup><sup>1</sup>University of Florida, Gainesville, FL

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

**Track:Tissue Engineering – 7-2-17****Musculoskeletal Tissue Engineering – II**

Chairs: Elizabeth Cosgriff-Hernandez, Robert Mauck

Ballroom G

**1:30PM OP-7-2-17A** Xenogenic Biologic Scaffold as a Temporomandibular Joint Disc in a Canine ModelA. ALMARZA<sup>1</sup>, B. BROWN<sup>1</sup>, W. CHUNG<sup>1</sup>, C. KUNKLE<sup>1</sup>, S. HENDERSON<sup>1</sup>, AND S. BADYLAK<sup>1</sup><sup>1</sup>University of Pittsburgh, Pittsburgh, PA**1:45PM OP-7-2-17B** Histologic and Mechanical Analysis of Engineered Bone-Ligament-Bone Constructs After 6-Month ACL Reconstruction in SheepJ. MA<sup>1</sup>, M. SMETANA<sup>1</sup>, L. LARKIN<sup>1</sup>, T. KOSTROMINOVA<sup>2</sup>, E. WOJTYTS<sup>1</sup>, AND E. ARRUDA<sup>1</sup><sup>1</sup>University of Michigan, Ann Arbor, MI, <sup>2</sup>Indiana University School of Medicine Northwest, Gary, IN**2:00PM OP-7-2-17C** Biodegradable, Anti-inflammatory Polymer to Aid Bone Defect Repair and Prevent Soft Tissue IngrowthS. SNYDER<sup>1</sup>, J. O'CONNOR<sup>2</sup>, J. RICCI<sup>3</sup>, AND K. UHRICH<sup>1</sup><sup>1</sup>Rutgers University, Piscataway, NJ, <sup>2</sup>University of Medicine and Dentistry of New Jersey, Newark, NJ, <sup>3</sup>New York University, New York, NY

**2:15PM OP-7-2-17D** Zonal Chondrocyte Response to Growth Factor Delivery and Matrix MoleculesE. E. COATES<sup>1</sup>, AND J. P. FISHER<sup>1</sup><sup>1</sup>University of Maryland, College Park, MD**2:30PM OP-7-2-17E** Phenotype Retention and Cell Migration From Minced Cartilage in Chondroitin Sulfate-Bone Marrow GelsJ. SIMSON<sup>1</sup>, AND J. ELISSEFF<sup>1</sup><sup>1</sup>Johns Hopkins University, Baltimore, MD**2:45PM OP-7-2-17F** Poroelastic Material Properties of Hydrogels and Cartilage Evaluated Using UltrasoundJ. WALKER<sup>1</sup>, J. M. MANSOUR<sup>1</sup>, A. I. CAPLAN<sup>1</sup>, V. M. GOLDBERG<sup>1</sup>, AND J. F. WELTER<sup>1</sup><sup>1</sup>Case Western Reserve University, Cleveland, OH**\*Tissue Engineering Track sponsored by Kinetic Concepts, Inc.**

**Track: Respiratory Engineering – 7-3-1****Complex and Multiscale Behavior in the Lung**

Chairs: Jason H.T. Bates, Tilo Winkler

Room 12A

**4:00PM OP-7-3-1A** Multi-scale Manifestations of Airway Smooth Muscle MechanicsJ. H. BATES<sup>1</sup><sup>1</sup>University of Vermont, Burlington, VT**4:15PM OP-7-3-1B** Effects of Intratidal Overdistention and Derecruitment on Global Lung Mechanics: A Simulation StudyR. AMINI<sup>1</sup>, AND D. W. KACZKA<sup>1</sup><sup>1</sup>Beth Israel Deaconess Medical Center, Boston, MA**4:30PM OP-7-3-1C** Computational Model of Pulmonary Small Airways InterdependenceH. FUJIOKA<sup>1</sup>, D. HALPERN<sup>2</sup>, AND D. P. GAVER III<sup>1</sup><sup>1</sup>Tulane University, New Orleans, LA, <sup>2</sup>University of Alabama, Tuscaloosa, AL**4:45PM OP-7-3-1D** A Multi-scale Model of Regional Perfusion in the Human Pulmonary CirculationM. TAWHAI<sup>1</sup>, A. CLARK<sup>1</sup>, AND K. BURROWES<sup>2</sup><sup>1</sup>University of Auckland, Auckland, Auckland, New Zealand, <sup>2</sup>Oxford University, Oxford, Oxfordshire, United Kingdom**5:00PM OP-7-3-1E** Long-range Elastic Interactions Due to Gravity in a Network Model of Co-existent Pulmonary Emphysema and FibrosisB. SUKI<sup>1</sup>, H. PARAMESWARAN<sup>1</sup>, A. MAJUMDAR<sup>1</sup>, V. COTTIN<sup>2</sup>, J-F. CORDIER<sup>3</sup>, AND J. H. BATES<sup>4</sup><sup>1</sup>Boston University, Boston, MA, <sup>2</sup>Lyon University, Lyon, France, <sup>3</sup>Université Claude Bernard, Lyon, France, <sup>4</sup>University of Vermont, Burlington, VT**5:15PM OP-7-3-1F** Dynamic Length Scale Behavior of Ventilation in a Model of BronchoconstrictionT. WINKLER<sup>1,2</sup>, A. BRAUNE<sup>1</sup>, AND J. G. VENEGAS<sup>1</sup><sup>1</sup>Massachusetts General Hospital, Boston, MA, <sup>2</sup>Harvard Medical School, Boston, MA**Track: Biomedical Imaging and Optics – 7-3-2****Optical and Ultrasound Imaging of Cancer**

Chairs: Laura Marcu, Kathy Nightingale

Room 12B

**4:00PM OP-7-3-2A** In Vivo Measurements of the Mechano-environment of Rat Mammary TumorsY. WANG<sup>1,2</sup>, M. ORESCANIN<sup>1,2</sup>, AND M. INSANA<sup>1,2</sup><sup>1</sup>University of Illinois at Urbana-Champaign, Urbana, IL, <sup>2</sup>Beckman Institute of Advanced Science and Technology, Urbana, IL**4:15PM OP-7-3-2B** Real-Time Hyperspectral Endoscope for Early Cancer DiagnosticsR. T. KESTER<sup>1</sup>, N. BEDARD<sup>1</sup>, AND T. S. TKACZYK<sup>1</sup><sup>1</sup>Rice University, Houston, TX**4:30PM OP-7-3-2C** Optical Imaging of Ovarian CarcinogenesisJ. BARTON<sup>1</sup><sup>1</sup>The University of Arizona, Tucson, AZ**4:45PM OP-7-3-2D** In Vivo Detection of Oral Cancer Based on OCT-derived Morphological and FLIM-derived Biochemical Features of the Oral MucosaP. PANDE<sup>1</sup>, S. SHRESTA<sup>1</sup>, J. PARK<sup>1</sup>, B. E. APPLGATE<sup>1</sup>, AND J. A. JO<sup>1</sup><sup>1</sup>Texas A&M University, College Station, TX**5:00PM OP-7-3-2E** A Hand-held Imaging and Spectroscopy Device for Intraoperative, Contrast-enhanced Tumor DetectionA. M. MOHS<sup>1</sup>, M. C. MANCINI<sup>1</sup>, J. M. PROVENZALE<sup>1,2</sup>, S. SINGHAL<sup>3</sup>, M. D. WANG<sup>1</sup>, AND S. NIE<sup>1</sup><sup>1</sup>Emory - Georgia Tech, Atlanta, GA, <sup>2</sup>Duke University, Durham, NC, <sup>3</sup>University of Pennsylvania, Philadelphia, PA**5:15PM OP-7-3-2F** How Multiphoton Imaging Will Revolutionize Intraoperative Surgical DecisionsW. ZIPFEL<sup>1</sup>, AND R. WILLIAMS<sup>1</sup><sup>1</sup>Cornell University, Ithaca, NY**Track: Biomedical Imaging and Optics – 7-3-3****CV Imaging**

Chairs: Gang Bao, Angie Louie

Room 19A

**4:00PM OP-7-3-3A** Three-dimensional Photothermal Wave Imaging of Lipids in Atherosclerotic PlaqueT. WANG<sup>1</sup>, J. MANCUSO<sup>2</sup>, B. WILLSEY<sup>1</sup>, X. LI<sup>2</sup>, L. MA<sup>1</sup>, K. P. JOHNSTON<sup>1</sup>, M. D. FELDMAN<sup>2</sup>, AND T. E. MILNER<sup>1</sup><sup>1</sup>University of Texas at Austin, Austin, TX, <sup>2</sup>University of Texas Health Science Center at San Antonio, San Antonio, TX**4:15PM OP-7-3-3B** Time Resolved Spectroscopy Differentiates Matrix Metalloproteinase Levels in Atherosclerotic PlaqueJ. E. PHIPPS<sup>1</sup>, N. HATAMI<sup>1</sup>, J. JO<sup>1</sup>, M. C. FISHBEIN<sup>2</sup>, T. PAPAIOANNOU<sup>3</sup>, Q. FANG<sup>3</sup>, J. BAKER<sup>2</sup>, AND L. MARCU<sup>1</sup><sup>1</sup>University of California, Davis, Davis, CA, <sup>2</sup>University of California, Los Angeles, Los Angeles, CA, <sup>3</sup>Cedars Sinai Medical Center, Los Angeles, CA**4:30PM OP-7-3-3C** Multifunctional Nanoclusters for Imaging Plaque-Based MacrophagesB. W. WILLSEY<sup>1</sup>, L. L. MA<sup>1</sup>, T. WANG<sup>1</sup>, V. SAPOZHNIKOVA<sup>2</sup>, J. MANCUSO<sup>2,3</sup>, J. T. JENKINS<sup>2</sup>, A. BORWANKAR<sup>1</sup>, D. RIGDON<sup>1</sup>, M. FELDMAN<sup>2,3</sup>, T. MILNER<sup>1</sup>, AND K. JOHNSTON<sup>1</sup><sup>1</sup>University of Texas at Austin, Austin, TX, <sup>2</sup>University of Texas Health Science Center San Antonio, San Antonio, TX, <sup>3</sup>South Texas Veteran Affairs Hospital System, San Antonio, TX**4:45PM OP-7-3-3D** High Resolution Cardiac Wall Motion Analysis Using 320-detector CT: A First StudyA. POURMORTEZA<sup>1</sup>, A. C. LARDO<sup>1</sup>, D. HERZKA<sup>1</sup>, J. L. PRINCE<sup>1</sup>, AND E. R. MCVEIGH<sup>1</sup><sup>1</sup>Johns Hopkins University School of Medicine, Baltimore, MD**5:00PM OP-7-3-3E** Guiding Transcatheter Cardiac Radiofrequency Ablation with Acoustic Radiation Force Impulse ImagingS. A. EYERLY<sup>1</sup>, T. D. BAHNSON<sup>2</sup>, S. J. HSU<sup>3</sup>, D. P. BRADWAY<sup>1</sup>, G. E. TRAEHY<sup>1,2</sup>, AND P. D. WOLF<sup>1</sup><sup>1</sup>Duke University, Durham, NC, <sup>2</sup>Duke University Medical Center, Durham, NC, <sup>3</sup>Siemens Healthcare, Issaquah, WA**5:15PM OP-7-3-3F** A Semi-automated Approach to Mitral Valve Morphometry Using Real-time 3D EchocardiographyA. M. POUCH<sup>1</sup>, P. A. YUSHKEVICH<sup>1</sup>, B. M. JACKSON<sup>1</sup>, J. H. GORMAN<sup>1</sup>, R. C. GORMAN<sup>1</sup>, AND C. M. SEHGAL<sup>1</sup><sup>1</sup>University of Pennsylvania, Philadelphia, PA**Track: Neural Engineering – 7-3-4****Engineering the Neural Environment**

Chairs: Jeffrey Capadona, Shelly Sakiyama-Elbert

Room 19B

**4:00PM OP-7-3-4A** A Novel Optically Transparent Biochip for Site-Specific Transfection of Cells in a CultureC. PATEL<sup>1</sup>, A. SRIDHARAN<sup>1</sup>, AND J. MUTHUSWAMY<sup>1</sup><sup>1</sup>Arizona State University, Tempe, AZ

**4:15PM OP-7-3-4B** Electrical Activity Promotes Neuronal Survival and RegenerationJ. GOLDBERG<sup>1</sup>, AND R. G. CORREDOR<sup>1</sup><sup>1</sup>University of Miami, Miami, FL**4:30PM OP-7-3-4C** Three-Dimensional Gradients of Immobilized FactorsS. SEIDLITS<sup>1</sup>, E. RITSCHDORFF<sup>1</sup>, D. HERNANDEZ<sup>1</sup>, E. SPIVEY<sup>1</sup>, C. SCHMIDT<sup>1</sup>, AND J. SHEAR<sup>1</sup><sup>1</sup>University of Texas at Austin, Austin, TX**4:45PM OP-7-3-4D** The Formation of Nerve Functional Units by Embryonic Stem Cells in the Novel Microfluidic PlatformI. YANG<sup>1</sup>, S. LIU<sup>2</sup>, AND N. THAKOR<sup>1</sup><sup>1</sup>Johns Hopkins University, Baltimore, MD, <sup>2</sup>Kennedy Krieger Institute, Baltimore, MD**5:00PM OP-7-3-4E** Novel Partially-biodegradable Neural Probe and Biocompatible Tissue ResponseM. HAN<sup>1</sup>, D. B. MCCREERY<sup>1</sup>, AND P. S. MANOOKITWONGSA<sup>1</sup><sup>1</sup>Huntington Medical Research Institutes, Pasadena, CA**5:15PM OP-7-3-4F** Laminin Modified Hyaluronic Acid Hydrogels Promote Axonal Regeneration Following Spinal Cord Injury in RatsB. D. MILMAN<sup>1</sup>, Z. Z. KHAING<sup>1</sup>, S. A. GEISSLER<sup>1</sup>, AND C. E. SCHMIDT<sup>1</sup><sup>1</sup>University of Texas at Austin, Austin, TX**Track: Cellular and Molecular Engineering – 7-3-5  
Molecular Engineering – II**

Chairs: Craig Duvall, Junghae Suh

Room 18A

**4:00PM OP-7-3-5A** Engineering Aglycosylated Antibodies with Improved Circulation Half-lifeT. KANG<sup>1</sup>, S. JUNG<sup>1</sup>, AND G. GEORGIU<sup>1</sup><sup>1</sup>The University of Texas at Austin, Austin, TX**4:15PM OP-7-3-5B** Toward Novel Molecular Sensors: Incorporating Unnatural Amino Acids in Stem CellsK. MONCIVAIS<sup>1</sup>, L. XIANG<sup>1</sup>, AND Z. J. ZHANG<sup>1</sup><sup>1</sup>University of Texas at Austin, Austin, TX**4:30PM OP-7-3-5C** Development of a Novel Fibrin Binding Peptide for Incorporation Into BiomatricesJ. J. RICE<sup>1</sup>, M. MARTINO<sup>1</sup>, S. KONTOS<sup>1</sup>, AND J. HUBBELL<sup>1</sup><sup>1</sup>EPFL, Lausanne, Switzerland**4:45PM OP-7-3-5D** Influence on Pertussis Toxin Intracellular Trafficking by AntibodiesJ. N. SUTHERLAND<sup>1</sup>, AND J. A. MAYNARD<sup>1</sup><sup>1</sup>The University of Texas at Austin, Austin, TX**5:00PM OP-7-3-5E** Determining the Disassociation Constant of Protein-Protein Interaction Using FRET-based MethodY. SONG<sup>1</sup>, AND J. LIAO<sup>1</sup><sup>1</sup>University of California, Riverside, Riverside, CA**5:15PM OP-7-3-5F** Determining Self-Assembly Mechanism of a Protein NanocageT. PENG<sup>1</sup>, AND S. LIM<sup>1</sup><sup>1</sup>Nanyang Technological University, Nanyang, Singapore**Track: Cellular and Molecular Engineering – 7-3-6  
Mechanotransduction – I**

Chairs: Chris Jacobs, Jeff Jacot

Room 18B

**4:00PM OP-7-3-6A** Regulation of Stretch-induced JNK, p38, and ERK Activities by Stress Fiber TensionH.-J. HSU<sup>1</sup>, C.-F. LEE<sup>1</sup>, A. LOCKE<sup>1</sup>, S. Q. VANDERZYL<sup>1</sup>, AND R. R. KAUNAS<sup>1</sup><sup>1</sup>Texas A&M, College Station, TX**4:15PM OP-7-3-6B** Glycated Substrate Altering Endothelial Cell Response to Fluid Shear StressS. F. KEMENY<sup>1</sup>, AND A. M. CLYNE<sup>1</sup><sup>1</sup>Drexel University, Philadelphia, PA**4:30PM OP-7-3-6C** Defining the Gene Expression Changes Required for Morphogenesis of Engineered TissuesK. LEE<sup>1</sup>, AND C. M. NELSON<sup>1</sup><sup>1</sup>Princeton University, Princeton, NJ**4:45PM OP-7-3-6D** Tissue Assembly Requires Sensitivity to Matrix Mechanics and Differential ECM AssemblyJ. P. CALIFANO<sup>1</sup>, AND C. A. REINHART-KING<sup>1</sup><sup>1</sup>Cornell University, Ithaca, NY**5:00PM OP-7-3-6E** A Genetic Strategy for Graded, Dynamic Control of Cell-matrix MechanobiologyJ. MACKAY<sup>1</sup>, A. KEUNG<sup>1</sup>, AND S. KUMAR<sup>1</sup><sup>1</sup>University of California, Berkeley, CA**5:15PM OP-7-3-6F** Effects of Fluid Flow on TGF-Beta I Signaling in Human Mesenchymal Stem CellsR. DIOP<sup>1</sup>, AND S. LI<sup>1</sup><sup>1</sup>University of California, Berkeley, CA**Track: Cardiovascular Engineering – 7-3-7  
Innovations in Cardiovascular  
Bioengineering II:Vascular**

Chairs: Hai-Chao Han, Amina Qutub

Room 18C

**4:00PM OP-7-3-7A** Effects of Aortic Wave Dynamics on Left Ventricular Power RequirementN. M. PAHLEVAN<sup>1</sup>, AND M. GHARIB<sup>1</sup><sup>1</sup>California Institute of Technology, Pasadena, CA**4:15PM OP-7-3-7B** In Vitro Vasospasms: Acute Traumatic Injury and Vascular HypercontractilityP. W. ALFORD<sup>1,2</sup>, J. A. GROSS<sup>1,2</sup>, M. D. BRIGHAM<sup>1,2</sup>, A. W. FEINBERG<sup>1,2</sup>, AND K. K. PARKER<sup>1,2</sup><sup>1</sup>Disease Biophysics Group, Harvard University, Cambridge, MA, <sup>2</sup>Wyss Institute for Biologically Inspired Engineering, Boston, MA**4:30PM OP-7-3-7C** The Effect of Aneurysm on the Delamination Strength in Human Ascending Thoracic AortaS. PASTA<sup>1,2</sup>, J. A. PHILLIPPI<sup>1,3</sup>, S. C. WATKINS<sup>1,3</sup>, T. G. GLEASON<sup>1,3</sup>, AND D. A. VORP<sup>1,3</sup><sup>1</sup>University of Pittsburgh, Pittsburgh, PA, <sup>2</sup>RiMED Foundation, Palermo, Italy, Italy,<sup>3</sup>McGowan Institute for Regenerative Medicine, Pittsburgh, PA**4:45PM OP-7-3-7D** Fluid-structure Interaction (FSI) Modeling in Patient Based Vulnerable Plaques and Carotid ArteriesM. XENOS<sup>1</sup>, D. PETER<sup>1</sup>, X. LIANG<sup>1</sup>, I. LAVI<sup>2</sup>, Y. ALEMU<sup>1</sup>, S. EINAV<sup>1</sup>, AND D. BLUESTEIN<sup>1</sup><sup>1</sup>Stony Brook University, Stony Brook, NY, <sup>2</sup>Tel Aviv University, Tel Aviv, Israel

**5:00PM OP-7-3-7E** Cerebral Artery Blood Flow As Source of Outer Ear Canal Acoustic EmissionsP. RICHARDSON<sup>1</sup>, R. LEVINE<sup>2</sup>, AND Y. YU<sup>1</sup><sup>1</sup>Brown University, Providence, RI, <sup>2</sup>Mass Eye & Ear Inst, Boston, MA**5:15PM OP-7-3-7F** Effect of Isoflurane on Brain Oxygen Autoregulation in RabbitsJ. EASSA<sup>1</sup>, J. LAKHOO<sup>1</sup>, P. HAN<sup>1</sup>, D. AKSENOV<sup>2,3</sup>, A. WYRWCZ<sup>2,3</sup>, AND R. A. LINSENMEIER<sup>1</sup><sup>1</sup>Northwestern University, Evanston, IL, <sup>2</sup>NorthShore University HealthSystem, Evanston, IL, <sup>3</sup>University of Chicago, Chicago, IL**Track: Cardiovascular Engineering – 7-3-8  
Microvasculature, Angiogenesis, and  
Capillary Patches**Chairs: Shayn Peirce-Cottler, Mariah Hahn  
Room 18D**4:00PM OP-7-3-8A** Spatial Regulation and Temporal Coordination of Angiogenesis by NotchW. W. YUEN<sup>1</sup>, N. R. DU<sup>1</sup>, AND D. J. MOONEY<sup>1</sup><sup>1</sup>Harvard University, Cambridge, MA**4:15PM OP-7-3-8B** 3D Angiogenic Sprouting Controlled by Adhesive Ligands and MMP-susceptibility in PEG-Peptide HydrogelsJ. S. MILLER<sup>1</sup>, C. J. SHEN<sup>1</sup>, W. R. LEGANT<sup>1</sup>, J. D. BARANSKI<sup>1</sup>, B. L. BLAKELY<sup>1</sup>, AND C. S. CHEN<sup>1</sup><sup>1</sup>University of Pennsylvania, Philadelphia, PA**4:30PM OP-7-3-8C** MMP-9 of Bone Marrow-Derived Cell Origin Regulates Arteriogenesis and Ischemic Skeletal Muscle RegenerationJ. K. MEISNER<sup>1</sup>, S. S. BAJIKAR<sup>1</sup>, AND R. J. PRICE<sup>1</sup><sup>1</sup>University of Virginia, Charlottesville, VA**4:45PM OP-7-3-8D** Barrier Properties and Endothelial Cells – Pericytes Interactions within Microvascular ScaffoldsY. ZHENG<sup>1</sup>, N. W. CHOI<sup>1</sup>, A. DIAZ-SANTANA<sup>1</sup>, M. CRAVEN<sup>1</sup>, S. S. VERBRIDGE<sup>1</sup>, C. FISCHBACH-TESCHL<sup>1</sup>, AND A. D. STROOCK<sup>1</sup><sup>1</sup>Cornell University, Ithaca, NY**5:00PM OP-7-3-8E** Wrapping-and-Tapping Anastomosis between Implanted Endothelial Networks and Host VasculatureG. CHENG<sup>1</sup>, S. LIAO<sup>1</sup>, H-K. WONG<sup>1</sup>, D. LACORRE<sup>1</sup>, E. DI TOMASO<sup>2</sup>, P. AU<sup>3</sup>, R. K. JAIN<sup>1</sup>, D. FUKUMURA<sup>1</sup>, AND L. L. MUNN<sup>4</sup><sup>1</sup>Massachusetts General Hospital, Boston, MA, <sup>2</sup>Novartis, Cambridge, MA, <sup>3</sup>FDA, Boston, MA, <sup>4</sup>Harvard Medical School, Charlestown, MA**5:15PM OP-7-3-8F** Hemodynamic Systems Analysis of Capillary Network Remodeling During the Progression Type 2 DiabetesK. F. BENEDICT<sup>1</sup>, G. COFFIN<sup>1</sup>, E. J. BARRETT<sup>1</sup>, AND T. C. SKALAK<sup>1</sup><sup>1</sup>University of Virginia, Charlottesville, VA**Track: Orthopedic and Rehabilitation  
Engineering – 7-3-9****Musculoskeletal Cell Mechanotransduction**Chairs: Adam Hsieh, Vassilios Sikavitsas  
Room 17A**4:00PM OP-7-3-9A** Tenocytic Differentiation by Wharton's Jelly and Mesenchymal Stem Cells under Cyclical StretchingV. I. SIKAVITSAS<sup>1</sup>, B. ENGBRETSON<sup>1</sup>, W. YATES<sup>1</sup>, AND R. ABOUSLEIMAN<sup>2</sup><sup>1</sup>University of Oklahoma, Norman, OK, <sup>2</sup>Oklahoma Medical Research Foundation, Norman, OK**4:15PM OP-7-3-9B** Changes in Gene Expression of Nucleus Pulposus Cells Subjected to Distinct Load Histories *In Vivo*D. HWANG<sup>1</sup>, AND A. H. HSIEH<sup>1,2</sup><sup>1</sup>University of Maryland, College Park, MD, <sup>2</sup>University of Maryland, Baltimore, MD**4:30PM OP-7-3-9C** Development of 3D Culture Conditions for Bone Marrow Mesenchymal Stem CellsB. MCGOWAN<sup>1</sup>, AND J. NAGATOMI<sup>1</sup><sup>1</sup>Clemson University, Clemson, SC**4:45PM OP-7-3-9D** Distraction Osteogenesis in Organ CultureM. SAUNDERS<sup>1</sup>, J. VAN SICKELS<sup>1</sup>, B. HEIL<sup>1</sup>, AND K. GURLEY<sup>1</sup><sup>1</sup>University of Kentucky, Lexington, KY**5:00PM OP-7-3-9E** Tensile Stretch Inhibits BMP4 Mediated Mesenchymal Stem Cell AdipogenesisJ. LEE<sup>1</sup>, AND J. LIM<sup>1</sup><sup>1</sup>University of Nebraska, Lincoln, NE**5:15PM OP-7-3-9F** Effect of Estrogen Deficiency on Osteocyte Lacunar Density and Canalicular NumberD. SHARMA<sup>1</sup>, J. D. LEVY<sup>1</sup>, S. B. DOTY<sup>2</sup>, AND S. P. FRITTON<sup>1</sup><sup>1</sup>City College of New York, New York, NY, <sup>2</sup>Hospital for Special Surgery, New York, NY**Track: Systems Biology, Bioinformatics and  
Computational Biology – 7-3-10****Molecular and Cellular Design  
and Evolution**Chairs: Casim Sarkar, Mike Shuler  
Room 17B**4:00PM OP-7-3-10A** Spatio-temporal Character of Selection and Diversity over the H3 Influenza HemagglutininK. PAN<sup>1</sup>, AND M. W. DEEM<sup>1</sup><sup>1</sup>Rice University, Houston, TX**4:15PM OP-7-3-10B** A Forward-Genetic Screen and Dynamic Analysis of Lambda Phage Host-Dependencies Reveals an Extensive Interaction Network and a New Anti-Viral StrategyN. D. MAYNARD<sup>1</sup>, E. BIRCH<sup>1</sup>, M. GUTSSHOW<sup>1</sup>, AND M. COVERT<sup>1</sup><sup>1</sup>Stanford University, Palo Alto, CA**4:30PM OP-7-3-10C** Interplay of Lineage-Specific Receptor and Transcription Factor during ErythropoiesisS. PALANI<sup>1</sup>, AND C. A. SARKAR<sup>1</sup><sup>1</sup>University of Pennsylvania, Philadelphia, PA**4:45PM OP-7-3-10D** Robust Network Topologies for Generating Switch-like Cellular ResponsesN. A. SHAH<sup>1</sup>, AND C. A. SARKAR<sup>2</sup><sup>1</sup>University of Pennsylvania School of Medicine, Philadelphia, PA, <sup>2</sup>University of Pennsylvania, Philadelphia, PA**5:00PM OP-7-3-10E** Cross Reactive Aptamer Microarrays, a New Approach to Differential SensingS. STEWART<sup>1</sup>, A. SYRETT<sup>1</sup>, A. ELLINGTON<sup>1</sup>, AND E. ANSLYN<sup>1</sup><sup>1</sup>University of Texas, Austin, TX**5:15PM OP-7-3-10F** Quantifying Metabolic Diversity: Environmental Constraints on Metabolic ProductionP. A. JENSEN<sup>1</sup>, AND J. A. PAPIN<sup>1</sup><sup>1</sup>University of Virginia, Charlottesville, VA

**Track: Devices: Nano to Micro – 7-3-11****Medical Diagnostics: Nano to Micro Devices – II**

Chairs: Chang Liu, Sihong Wang  
Room 16A

**4:00PM OP-7-3-11A** Cardiac Marker Detection Using a Nanofluidics, a Competitive Immunoassay, and Whole Blood Filtering Device  
M. E. BENFORD<sup>1</sup>, M. WANG<sup>1</sup>, B. REINEMUND<sup>1</sup>, T. GOOD<sup>2</sup>, J. KAMEOKA<sup>1</sup>, AND G. COTÉ<sup>1</sup>  
<sup>1</sup>Texas A&M University, College Station, TX, <sup>2</sup>University of Maryland-Baltimore County, Baltimore, MD

**4:15PM OP-7-3-11B** Quantum Dot Light Emitting Diodes on Silicon as Multicolor Excitation Sources for On-Chip Multispectral Sensor  
A. GOPAL<sup>1</sup>, L. D'AMICO<sup>2</sup>, K. HOSHINO<sup>1</sup>, P. R. GASCOYNE<sup>2</sup>, AND X. J. ZHANG<sup>1</sup>  
<sup>1</sup>The University of Texas at Austin, Austin, TX, <sup>2</sup>University of Texas M D Anderson Cancer Center, Houston, TX

**4:30PM OP-7-3-11C** Cancer Cell Assays Using Immunocapture, Subcellular Imaging, and Cell Release In GEDI Microdevices  
J. P. GLEGHORN<sup>1</sup>, S. M. SANTANA<sup>1</sup>, E. D. PRATT<sup>1</sup>, M. S. LOFTUS<sup>2</sup>, M. JODARI-KARIMI<sup>2</sup>, N. H. BANDER<sup>2</sup>, D. M. NANUS<sup>2</sup>, P. GIANNAKAKOU<sup>2</sup>, AND B. J. KIRBY<sup>1</sup>  
<sup>1</sup>Cornell University, Ithaca, NY, <sup>2</sup>Weill Cornell Medical College, New York, NY

**4:45PM OP-7-3-11D** Precision Microfluidic Oscillators for On-Chip Timing and Control  
P. DUNCAN<sup>1</sup>, T. NGUYEN<sup>1</sup>, AND E. HUI<sup>1</sup>  
<sup>1</sup>University of California, Irvine, Irvine, CA

**5:00PM OP-7-3-11E** Label-free Microarray Imaging for Screening Infectious Diseases  
S. AHN<sup>1</sup>, G. DAABOUL<sup>1</sup>, Q. CAO<sup>1</sup>, E. OZKUMUR<sup>2</sup>, C. M. KLAPPERICH<sup>1</sup>, M. CABODI<sup>1</sup>, AND S. UNLU<sup>1</sup>  
<sup>1</sup>Boston University, Boston, MA, <sup>2</sup>Massachusetts General Hospital, Charlestown, MA

**5:15PM OP-7-3-11F** Screening of Low-mass Proteins as Biomarkers for Early Detection of Ovarian Cancer Using Nanoporous Silica Chips  
Y. PENG<sup>1</sup>, A. CARROLL<sup>2</sup>, Y. HU<sup>1</sup>, Y. FLORES<sup>1</sup>, T. TANAKA<sup>1</sup>, A. BOUAMRANI<sup>1</sup>, A. SOOD<sup>2</sup>, AND M. FERRARI<sup>1,2</sup>  
<sup>1</sup>The University of Texas Health Science Center at Houston, Houston, TX, <sup>2</sup>The University of Texas, M.D Anderson Cancer Center, Houston, TX

**Track: Devices: Nano to Micro – 7-3-12****Nano to Micro: Fluidic Technologies – II**

Chairs: Tony Huang, Ketul Popat  
Room 16B

**4:00PM OP-7-3-12A** Hollow-Core Fiberoptic Fiber Flow Characterization and Diffusion Analysis in Dermal Tissue  
R. L. HOOD<sup>1</sup>, M. A. KOSOGLU<sup>1</sup>, Y. CHEN<sup>1</sup>, Z. MONTGOMERY<sup>1</sup>, AND C. G. RYLANDER<sup>1</sup>  
<sup>1</sup>Virginia Tech, Blacksburg, VA

**4:15PM OP-7-3-12B** Engineering Two-dimensional Paper Networks For Improved Paper-based Assay Performance  
E. FU<sup>1</sup>, B. LUTZ<sup>1</sup>, P. KAUFFMAN<sup>1</sup>, AND P. YAGER<sup>1</sup>  
<sup>1</sup>University of Washington, Seattle, WA

**4:30PM OP-7-3-12C** Microfluidic Screening Chip for Detection of Circulating Tumor Cell  
Y-Y. HUANG<sup>1</sup>, K. HOSHINO<sup>1</sup>, A. HORTON<sup>1</sup>, D. MALIK<sup>1</sup>, J. TAM<sup>1</sup>, K. SOKOLOV<sup>1</sup>, E. FRENKEL<sup>2</sup>, J. UHR<sup>2</sup>, N. LANE<sup>2</sup>, AND X. ZHANG<sup>1</sup>  
<sup>1</sup>The University of Texas at Austin, Austin, TX, <sup>2</sup>The University of Texas Southwestern Medical Center, Dallas, TX

**4:45PM OP-7-3-12D** A Novel, High-throughput, Single-cell Deformability Measurement Technique for Diagnostics and Therapeutics  
H. T. TSE<sup>1</sup>, D. R. GOSSETT<sup>1</sup>, S. LEE<sup>1</sup>, A. T. CLARK<sup>1</sup>, AND D. DI CARLO<sup>1</sup>  
<sup>1</sup>University of California Los Angeles, Los Angeles, CA

**5:00PM OP-7-3-12E** Measuring Oxygen Concentration Under *Staphylococcus aureus* Biofilms in Response to Chemical Gradients in a Microfluidic Device  
A. DHUMMAKUPT<sup>1</sup>, P. SAMSON<sup>1</sup>, D. MARKOV<sup>1</sup>, J. WIKSWO<sup>1</sup>, AND L. SHOR<sup>2</sup>  
<sup>1</sup>Vanderbilt University, Nashville, TN, <sup>2</sup>University of Connecticut, Storrs, CT

**5:15PM OP-7-3-12F** Investigating Bacterial Chemotaxis Toward Human Neuroendocrinal Hormone in a Microfluidics Model  
D. N. KIM<sup>1</sup>, M. HEGDE<sup>1</sup>, D. ENGLERT<sup>1</sup>, AND A. JAYARAMAN<sup>1</sup>  
<sup>1</sup>Texas A&M University, College Station, TX

**Track: Biomedical Engineering Education – 7-3-13****Community Partnerships: Innovation in Engineering Education**

Chairs: Adrienne Noe  
Room 14

**4:00PM OP-7-3-13A** Implementing Scientific Methods and Problem-Based Learning in Elementary School Classrooms  
Y-T. LIU<sup>1</sup>, S. HOLLEN<sup>1</sup>, J. TONEY<sup>1</sup>, T. HERBERT<sup>1</sup>, AND K. M. HABERSTROH<sup>1</sup>  
<sup>1</sup>Brown University, Providence, RI

**4:15PM OP-7-3-13B** CLIMB GK-12 Fellows: Bringing BME to the K-12 Classroom  
J. R. WEISER<sup>1</sup>, L. AUSTEN<sup>2</sup>, AND D. PUTNAM<sup>1</sup>  
<sup>1</sup>Cornell University, Ithaca, NY, <sup>2</sup>Southside High School, Elmira, NY

**4:30PM OP-7-3-13C** Middle School Students Explore Biomedical Engineering within the Context of Diabetes  
S. M. PEARCE<sup>1</sup>, V. FITZPATRICK<sup>1</sup>, J. BAZIL<sup>1</sup>, J. GROH<sup>1</sup>, AND A. E. RUNDELL<sup>1</sup>  
<sup>1</sup>Purdue University, West Lafayette, IN

**4:45PM OP-7-3-13D** Museum as Mechanism and Model  
A. HAWK<sup>1</sup>  
<sup>1</sup>National Museum of Health and Medicine, Washington, DC

**5:00PM OP-7-3-13E** The Possibilities Beyond  
J. V. CURLEY<sup>1</sup>  
<sup>1</sup>National Museum of Health and Medicine, Washington, DC

**5:15PM OP-7-3-13F** Synergistic Educational Endeavors with the National Museum of Health and Medicine  
P. FAGETTE<sup>1</sup>  
<sup>1</sup>BMES, Ewing, NJ

**Track: New Frontiers in Bioengineering – 7-3-14****Synthetic Biology in Health and Medicine**

Chairs: J. Christopher Anderson, Christina Smolke  
Room 15

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

**4:15PM OP-7-3-14B** Development of a Constitutive Promoter Library to Evaluate and Optimize Gene Expression Levels  
J. FERREIRA<sup>1</sup>, R. PEACOCK<sup>1</sup>, AND C. WANG<sup>1</sup>  
<sup>1</sup>Stanford University, Stanford, CA



**4:30PM OP-7-3-14C** Programming Gene Regulation: from Synthetic Gene Networks to Cell DifferentiationX. WANG<sup>1</sup><sup>1</sup>Arizona State University, Tempe, AZ**4:45PM OP-7-3-14D** Engineering a Functional Genetic Approach for Small Molecule CharacterizationJ. R. PRITCHARD<sup>1</sup>, H. JIANG<sup>2</sup>, L. GILBERT<sup>1</sup>, D. LAUFFENBURGER<sup>1</sup>, AND M. HEMANN<sup>1,2</sup><sup>1</sup>M.I.T., Cambridge, MA, <sup>2</sup>Koch Institute, Cambridge, MA**5:00PM OP-7-3-14E** Design of Anti-Cancer Bacterial TherapeuticsJ. C. ANDERSON<sup>1</sup><sup>1</sup>UC Berkeley, Berkeley, CA**5:15PM OP-7-3-14F** Tunable Signal Processing in Synthetic MAP Kinase ModulesE. C. O'SHAUGHNESSY<sup>1</sup>, S. PALANI<sup>2</sup>, J. J. COLLINS<sup>1</sup>, AND C. A. SARKAR<sup>2</sup><sup>1</sup>Howard Hughes Medical Institute and Boston University, Boston, MA, <sup>2</sup>University of Pennsylvania, Philadelphia, PA**Tracks: Drug Delivery, Tissue Engineering and Cellular and Molecular Engineering – 7-3-15****Acta Biomaterialia Gold Medal Award Session**

Ballroom G

**4:00PM** Advancing Biomaterial Strategies for Bone Tissue Engineering

PROF. ANTONIOS G. MIKOS

*Louis Calder Professor of Bioengineering and Chemical and Biomolecular Engineering, Director of John W. Cox Laboratory of Biomedical Engineering, Director of Center for Excellence in Tissue Engineering, Rice University***4:30PM** Hydrogel Matrices: Studying Biology in the Fourth Dimension

PROF. KRISTI ANSETH

*Distinguished Professor and HHMI Investigator, Department of Chemical & Biological Engineering, University of Colorado***5:00PM** Acta Biomaterialia Award Presentation: Advances in Hydrogels as Intelligent Biomaterials

PROF. NICHOLAS PEPPAS

*Fletcher Stuckey Pratt Chair in Engineering, Professor of Biomedical Engineering, Chemical Engineering and Pharmacy, Chai, Department of Biomedical Engineering, The University of Texas at Austin***5:20PM** Award Presentation

DR. ART COURY

**Track: Tissue Engineering \* – 7-3-16****Printing and Patterning in Tissue Engineering**

Chairs: Shashi Murthy, Celeste Nelson

Ballroom F

**4:00PM OP-7-3-16A** Ultrasound-Based Cell Patterning for the Vascularization of Three-Dimensional Engineered TissueK. A. Garvin<sup>1</sup>, D. C. Hocking<sup>1</sup>, and D. Dalecki<sup>1</sup><sup>1</sup>University of Rochester, Rochester, NY**4:15PM OP-7-3-16B** Engineering Epithelial/Stromal Interactions to Study Branching MorphogenesisS. MANIVANNAN<sup>1</sup>, A. PAVLOVICH<sup>1</sup>, AND C. NELSON<sup>1</sup><sup>1</sup>Princeton University, Princeton, NJ**4:30PM OP-7-3-16C** Spatially Patterning Cell Adhesion Ligands in Biodegradable, Photocrosslinked Alginate HydrogelsO. JEON<sup>1</sup>, C. POWELL<sup>1</sup>, AND E. ALSBERG<sup>1</sup><sup>1</sup>Case Western Reserve University, Cleveland, OH**4:45PM OP-7-3-16D** Rapid, Versatile Printing of Vascular Networks for Perfused 3D Tissue CultureJ. S. MILLER<sup>1</sup>, M. T. YANG<sup>1</sup>, D-H. NGUYEN<sup>1</sup>, AND C. S. CHEN<sup>1</sup><sup>1</sup>University of Pennsylvania, Philadelphia, PA**5:00PM OP-7-3-16E** Tissue OrigamiG. YE<sup>1</sup>, J-O. YOU<sup>1</sup>, AND D. T. AUGUSTE<sup>1</sup><sup>1</sup>Harvard University, Cambridge, MA**5:15PM OP-7-3-16F** Long-term Viability of Cells Encapsulated in 3D Photopatterned Hydrogels Fabricated using StereolithographyP. ZORLUTUNA<sup>1</sup>, V. CHAN<sup>1</sup>, J. JEONG<sup>1</sup>, H. KONG<sup>1</sup>, AND R. BASHIR<sup>1</sup><sup>1</sup>University of Illinois, Urbana-Champaign, Urbana, IL

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

**ALUMNI PANEL****4:00PM - 5:30PM** Ballroom E

BME alumni share their industry experiences and lessons learned to the audience.

**CAREER WORKSHOP****5:45PM - 7:15PM** Ballroom E

Students and early career alike can participate and take away writing tips from career professionals representatives.

FRIDAY, OCTOBER 8  
TODAY'S HIGHLIGHTS**PLENARY SESSION**

8:30am - 9:30am

Ballroom D, Convention Center

**Distinguished Achievement Lecture****FROM DRUG DELIVERY AND TARGETED THERAPEUTICS TO ADVANCED INTELLIGENT BIOMEDICAL DEVICES FOR IMPROVED HEALTH CARE**Nicholas A Peppas, ScD  
University of Texas, Austin**EXHIBIT HALL OPEN**

9:30am - 5:00pm

Exhibit Hall 4, Convention Center

**POSTER SESSION 8A**

9:30am - 1:00pm

Exhibit Hall 4, Convention Center

**PLATFORM SESSIONS 8-1**

10:30am - 12:00noon

See pages 86-90, Convention Center

**WOMEN IN BMES Luncheon**

12:00noon - 1:30pm

Salon AB, Hilton

**CAREER FAIR**

1:00pm - 5:00pm

Additional ticket purchase required

Exhibit Hall 4, Convention Center

**PLATFORM SESSIONS 8-2**

1:30pm - 3:00pm

See pages 103-107, Convention Center

**POSTER SESSION 8B**

1:30pm - 5:00pm

Exhibit Hall 4, Convention Center

**PLENARY SESSION**

4:00pm - 6:00pm

Ballroom D, Convention Center

**Distinguished Speakers Session**

FUTURE FRONTIERS OF BIOMEDICAL ENGINEERING

"Engineering The Next Generation of Cancer Therapeutic Enzymes and Antibodies"

George Georgiou, Ph.D., The University of Texas at Austin

"Bioengineering in Drug Discovery: Predictive Understanding of Cell Regulatory Network Operation"

Douglas Lauffenburger, Ph.D., Massachusetts Institute of Technology

"Stem Cells, Tissue Engineering, and Regenerative Medicine: Challenges Ahead"

Gordana Vunjak-Novakovic, Ph.D., Columbia University

"Photoacoustic Tomography: Breaking Through the Optical Diffusion Limit"

Lihong Wang, Ph.D., Washington University in St. Louis

**SPECIAL EVENT**

6:30pm - 9:30pm

Bullock Museum

**Track: Biomedical Imaging and Optics – PS-8A-1****Molecular Imaging****PS-8A-1-1 Engineering a Small Molecule-Activatable Bioluminescence Reporter**R. WARDEN<sup>1</sup>, AND A. TSOURKAS<sup>1</sup><sup>1</sup>University of Pennsylvania, Philadelphia, PA**PS-8A-1-2 Transient Absorption Ultrasonic Microscopy**R. L. SHELTON<sup>1</sup>, AND B. E. APPLGATE<sup>1</sup><sup>1</sup>Texas A&M University, College Station, TX**PS-8A-1-3 Multiplex Photoacoustic Imaging for Molecular Imaging of Cancerous Tumors Using Targeted Nanorods**C. L. BAYER<sup>1</sup>, Y-S. CHEN<sup>1</sup>, S. KIM<sup>1</sup>, S. MALLIDI<sup>1</sup>, K. SOKOLOV<sup>1,2</sup>, AND S. Y. EMELIANOV<sup>1</sup><sup>1</sup>The University of Texas at Austin, Austin, TX, <sup>2</sup>The University of Texas M.D. Anderson Cancer Center, Houston, TX**PS-8A-1-4 Synthesis of Transition-Metal Doped Zinc Selenide Quantum Dots for Bioimaging**C-H. QUEK<sup>1</sup><sup>1</sup>Duke University, Durham, NC**PS-8A-1-5 Applications of Potential Dependent DNA Orientation on Indium Tin Oxide Surface by Fluorescent-self Interference Microscopy**P. SPUHLER<sup>1</sup>, L. SOLA<sup>2</sup>, M. MONROE<sup>1</sup>, M. CHIARI<sup>2</sup>, AND M. UNLU<sup>1</sup><sup>1</sup>Boston University, Boston, MA, <sup>2</sup>CNR, Milan, Milan, Italy**PS-8A-1-6 Real-Time Observation of Rad51 Nucleoprotein Filament Formation**Y. QIU<sup>1</sup>, AND S. MYONG<sup>1</sup><sup>1</sup>University of Illinois at Urbana-Champaign, Urbana, IL**PS-8A-1-7 Alternating-color Nanoparticles for Particle Tracking**G. RUAN<sup>1</sup>, AND J. O. WINTER<sup>1</sup><sup>1</sup>The Ohio State University, Columbus, OH**PS-8A-1-8 Characterization of Solid State Photomultipliers in PET Detector Designs**J. SCHMALL<sup>1</sup>, E. RONCALI<sup>1</sup>, J. CHRISTIAN<sup>2</sup>, P. DOKHALE<sup>2</sup>, K. SHAH<sup>2</sup>, AND S. CHERRY<sup>1</sup><sup>1</sup>UC Davis, Davis, CA, <sup>2</sup>Radiation Monitoring Devices, Inc., Watertown, MA**PS-8A-1-9 Image Analysis Methods for Whole Cell cryo-Electron Tomography Data**K. WANG<sup>1</sup>, C-Y. FU<sup>2</sup>, P. C. DOERSCHUK<sup>1</sup>, AND J. E. JOHNSON<sup>2</sup><sup>1</sup>Cornell University, Ithaca, NY, <sup>2</sup>The Scripps Research Institute, La Jolla, CA**PS-8A-1-10 Design of pH Sensitive MR Contrast Agents for Tumor Imaging**S. CRAYTON<sup>1</sup>, AND A. TSOURKAS<sup>1</sup><sup>1</sup>University of Pennsylvania, Philadelphia, PA**PS-8A-1-11 Molecular Specific Biocompatible Gold Nanorods for Non-invasive Imaging and Therapy**P. P. JOSHI<sup>1</sup>, Y-S. CHEN<sup>1</sup>, S. J. YOON<sup>1</sup>, S. EMELIANOV<sup>1</sup>, AND K. SOKOLOV<sup>1,2</sup><sup>1</sup>University of Texas at Austin, Austin, TX, <sup>2</sup>MD Anderson Cancer Center, Houston, TX**PS-8A-1-12 Effects of Temperature on the Fluorescence Quantum Yield of Nano-Encapsulated ICG**S. GUPTA<sup>1</sup>, K. THENKONDAR<sup>1</sup>, H. MEHTA<sup>1</sup>, B. BAHMANI<sup>1</sup>, V. VULLEV<sup>1</sup>, AND B. ANVARI<sup>1</sup><sup>1</sup>University of California, Riverside, CA**PS-8A-1-13 Quantum Dot-Fluorescent Protein Fluorescence Resonance Energy Transfer Probe for Chloride Sensing**D. SOTTO<sup>1</sup>, AND G. BAO<sup>1</sup><sup>1</sup>Georgia Institute of Technology, Atlanta, GA

**PS-8A-1-14 MRI Contrast Agents: Nanoparticle Contrast Agent Enhancement Through Control of Particle Geometry**S. A. KHAN<sup>1</sup>, L. SUN<sup>1</sup>, AND A. CAPITANO<sup>1</sup>  
<sup>1</sup>University of Houston, Houston, TX**PS-8A-1-15 Enhanced Excitation of Multiple Fluorophores by Sub-10fs Laser Pulses for Two-photon Microscopy**C. WANG<sup>1</sup>  
<sup>1</sup>Texas A&M University at College Station, College Station, TX**PS-8A-1-16 Longitudinal Imaging With Single Cell Resolution in Mice With a LED-based Confocal Microendoscope**S. F. ELAHI<sup>1</sup>, Z. LIU<sup>1</sup>, K. LUKER<sup>1</sup>, G. LUKER<sup>1</sup>, AND T. WANG<sup>1</sup>  
<sup>1</sup>University of Michigan, Ann Arbor, MI**PS-8A-1-17 Immunoliposomes-Vehicles for Molecular Imaging of Inflamed Endothelium**D. DANILA<sup>1</sup>, M. LACKEY<sup>2</sup>, S. CASSCELLS<sup>1</sup>, AND J. L. CONYERS<sup>1</sup>  
<sup>1</sup>UTHealth, Houston, TX, <sup>2</sup>Howrey LLP, Houston, TX**PS-8A-1-18 Sensitivity of Detection of Biological AFM for Gold-Labeled Liposomes at HCAEC Membranes**J. L. CONYERS<sup>1</sup>, A. ZASK<sup>1</sup>, D. DANILA<sup>1</sup>, AND E. B. GOLUNSKI<sup>1</sup>  
<sup>1</sup>UTHealth, Houston, TX**Track: Cardiovascular Engineering – PS-8A-2****Cardiovascular Modeling****PS-8A-2-19 CANCELED****PS-8A-2-20 Lattice Kinetic Monte Carlo Simulations of Convectively-Driven Particle and Platelet Aggregation**M. H. FLAMM<sup>1</sup>, T. SINNO<sup>1</sup>, AND S. L. DIAMOND<sup>1</sup>  
<sup>1</sup>University of Pennsylvania, Philadelphia, PA**PS-8A-2-21 Cardiac Cell Culture Model to Study Cardiomyocytes under Physiological Loads**M-D. T. NGUYEN<sup>1</sup>, R. ESTRADA<sup>1</sup>, G. GIRIDHARAN<sup>1</sup>, S. D. PRABHU<sup>1</sup>, AND P. SETHU<sup>1</sup>  
<sup>1</sup>University of Louisville, Louisville, KY**PS-8A-2-22 Modeling Mechanical Heart Function**J. L. PALLADINO<sup>1</sup>, AND A. NOORDERGRAAF<sup>2</sup>  
<sup>1</sup>Trinity College, Hartford, CT, <sup>2</sup>University of Pennsylvania, Philadelphia, PA**PS-8A-2-23 Effects of Geometric Variations on the Buckling of Arteries**P. DATIR<sup>1</sup>, A. NORTHCUTT<sup>1</sup>, AND H-C. HAN<sup>1</sup>  
<sup>1</sup>University of Texas at San Antonio, San Antonio, TX**PS-8A-2-24 Discrete Phase Modeling of Platelet Aggregation and Adhesion in the Left Coronary Artery**W. YIN<sup>1</sup>, R. HARIHARAN<sup>1</sup>, F. ROUF<sup>1</sup>, S. SHANMUGAVELAYUDAM<sup>1</sup>, AND D. A. RUBENSTEIN<sup>1</sup>  
<sup>1</sup>Oklahoma State University, Stillwater, OK**PS-8A-2-25 Computational Geometric Analysis of the Normal and Hypertensive Human Right Ventricle**J. WU<sup>1</sup>, J. C. BRIGHAM<sup>1</sup>, M. A. SIMON<sup>1</sup>, S. TRIPATHY<sup>1</sup>, K. KIM<sup>1</sup>, AND M. SACKS<sup>1</sup>  
<sup>1</sup>University of Pittsburgh, Pittsburgh, PA**PS-8A-2-26 Model Simulated Impacts of Elevated Cytosolic Na<sup>+</sup> on Ca<sup>2+</sup> Handling, Mitochondrial Energetics and Reactive Oxygen Species in Guinea Pig Myocytes**L. ZHOU<sup>1</sup>, A-C. WEI<sup>1</sup>, T. LIU<sup>1</sup>, S. CORTASSA<sup>1</sup>, R. WINSLOW<sup>1</sup>, AND B. O'ROURKE<sup>1</sup>  
<sup>1</sup>Johns Hopkins University, Baltimore, MD**PS-8A-2-27 Microfluidic Devices to Study the Effect of Atherogenic Flow Pattern on Cultured Endothelial Cells**R. ESTRADA<sup>1</sup>, V. PARICHEHREH<sup>1</sup>, M-D. NGUYEN<sup>1</sup>, AND P. SETHU<sup>1</sup>  
<sup>1</sup>University of Louisville, Louisville, KY**PS-8A-2-28 Calibration of Abdominal Aortic Aneurism Models Using In Vivo Velocimetry Measurements**M. A. MCELROY<sup>1</sup>, G. MIHAI<sup>2</sup>, Y. DING<sup>2</sup>, S. RAJAGOPALAN<sup>2,3</sup>, O. P. SIMONETTI<sup>2,3</sup>, AND S. N. GHADIALI<sup>1,2</sup>  
<sup>1</sup>The Ohio State University, Columbus, OH, <sup>2</sup>Davis Heart and Lung Research Institute, Columbus, OH, <sup>3</sup>Richard M. Ross Heart Hospital, Columbus, OH**PS-8A-2-29 Microstructurally Motivated Constitutive Modeling of the Developing Mouse Aorta**J. K. CHENG<sup>1</sup>, J. E. WAGENSEIL<sup>2</sup>, AND R. P. MECHAM<sup>1</sup>  
<sup>1</sup>Washington University, St. Louis, MO, <sup>2</sup>Saint Louis University, St. Louis, MO**PS-8A-2-30 Characterization of Microcalcifications in Coronary Artery Disease**N. MALDONADO MARTINEZ<sup>1</sup>, A. KELLY<sup>1</sup>, S. CHAKRABORTI<sup>1</sup>, Y. VENGRENKYU<sup>2</sup>, L. CARDOSO<sup>1</sup>, AND S. WEINBAUM<sup>1</sup>  
<sup>1</sup>City College of New York, New York, NY, <sup>2</sup>New York University, New York, NY**PS-8A-2-31 Numerical Study of Fluid-Structure Interaction in a Developing Chick Heart**A. FALAHATPISHEH<sup>1</sup>, H. ALAVI<sup>1</sup>, S. J. STINSON<sup>1</sup>, L. JUNOR<sup>1</sup>, R. L. GOODWIN<sup>1</sup>, AND A. KHERADVAR<sup>1</sup>  
<sup>1</sup>University of South Carolina, Columbia, SC**PS-8A-2-32 Pumping During Fetal Cardiac Development: Peristaltic or Impedance?**J. MORAVEJI<sup>1</sup>, S. BIECHLER<sup>1</sup>, J. W. WEIDNER<sup>1</sup>, R. L. GOODWIN<sup>1</sup>, L. JUNOR<sup>1</sup>, AND A. KHERADVAR<sup>1</sup>  
<sup>1</sup>University of South Carolina, Columbia, SC**PS-8A-2-33 Multiscale Modeling of Blood Rheology in a Developing Heart: When Granularity Matters**J. MORAVEJI<sup>1</sup>, S. BIECHLER<sup>1</sup>, J. W. WEIDNER<sup>1</sup>, R. L. GOODWIN<sup>1</sup>, AND A. KHERADVAR<sup>1</sup>  
<sup>1</sup>University of South Carolina, Columbia, SC**Track: Cardiovascular Engineering – PS-8A-3****Myocardial Mechanics****PS-8A-3-34 Infrared Spectroscopy to Quantify Collagen in Infarcted Myocardium after Targeted VEGF Treatment**R. CHEHELTANI<sup>1</sup>, J. M. ROSANO<sup>1</sup>, N. E. D'SOUZA<sup>1</sup>, B. WANG<sup>1</sup>, N. PLESHKO<sup>1</sup>, AND M. F. KIANI<sup>1</sup>  
<sup>1</sup>Temple University, Philadelphia, PA**PS-8A-3-35 Molecular Electrophysiological Differences Between Genders in the Nonfailing Human Heart**C. M. AMBROSI<sup>1</sup>, N. MOAZAMI<sup>2</sup>, J. M. NERBONNE<sup>2</sup>, AND I. R. EFIMOV<sup>1</sup>  
<sup>1</sup>Washington University in St. Louis, St. Louis, MO, <sup>2</sup>Washington University School of Medicine, St. Louis, MO**PS-8A-3-36 Method for Ex Vivo Assessment of Functional Myocardial Mechanics**O. M. BENAVIDES<sup>1</sup>, AND J. G. JACOT<sup>1,2</sup>  
<sup>1</sup>Rice University, Houston, TX, <sup>2</sup>Texas Children's Hospital, Houston, TX**PS-8A-3-37 Comparison of Cardiac Wall Motion and Strain Patterns During Dobutamine Stress-Induced Ischemia**K. M. PARKER<sup>1</sup>, AND J. W. HOLMES<sup>1</sup>  
<sup>1</sup>University of Virginia, Charlottesville, VA**PS-8A-3-38 Characterization of Dyssynchrony in Contraction Strain Pattern**C. M. NAZZALI<sup>1</sup>, J. C. CRISCIONE<sup>2</sup>, AND L. MULLIGAN<sup>3</sup>  
<sup>1</sup>Texas A&M University, College Station, TX, <sup>2</sup>Texas A&M University, College Station, TX, <sup>3</sup>Medtronic, Inc., Mounds View, MN**PS-8A-3-39 A Micromechanics Model for Myocardium-Vessel Interaction in Perfused Myocardium**Y. LIU<sup>1</sup>, H. CHEN<sup>1</sup>, X. ZHAO<sup>1</sup>, AND G. S. KASSAB<sup>1</sup>  
<sup>1</sup>Indiana University-Purdue University, Indianapolis, IN

**PS-8A-3-40** The Structural and Biomechanical Properties of Porcine Myocardial Extracellular MatrixB. WANG<sup>1</sup>, D. MCCOLLUM<sup>1</sup>, M. E. TEDDER<sup>2</sup>, D. T. SIMIONESCU<sup>2</sup>, F. TO<sup>1</sup>, A. L. CURRY<sup>3</sup>, L. WILLIAMS<sup>1</sup>, AND J. LIAO<sup>1</sup><sup>1</sup>Mississippi State University, Mississippi State, MS, <sup>2</sup>Clemson University, Clemson, SC, <sup>3</sup>University of Memphis, Memphis, TN**PS-8A-3-41** Cardiac Myocyte Response to Engineered Extracellular MatrixV. LIN<sup>1</sup>, A. CHOPRA<sup>2</sup>, P. JAMNEY<sup>3</sup>, AND J. KRESH<sup>1</sup><sup>1</sup>Drexel University College of Medicine, Philadelphia, PA, <sup>2</sup>Drexel University, Philadelphia, PA, <sup>3</sup>University of Pennsylvania, Philadelphia, PA**Track: Cardiovascular Engineering – PS-8A-4****Vascular MechanoSignal Transduction****PS-8A-4-42** Red Blood Cell Dynamics and ATP Release – Implications for the VasculatureA. M. FORSYTH<sup>1</sup>, P. D. OWRUTSKY<sup>1</sup>, J. WAN<sup>2</sup>, AND H. A. STONE<sup>2</sup><sup>1</sup>Harvard University, Cambridge, MA, <sup>2</sup>Princeton University, Princeton, NJ**PS-8A-4-43** Tyrosine Phosphorylation of Endothelial Cell–Cell Adhesion Proteins Induced by Shear Stress GradientN. SAKAMOTO<sup>1</sup>, H. XIAOBO<sup>1</sup>, AND M. SATO<sup>1</sup><sup>1</sup>Tohoku University, Sendai, Miyagi, Japan**PS-8A-4-44** Mitochondrial Network Morphology in Postischemic Vascular Endothelial CellsR. J. GIEDT<sup>1</sup>, M. PRAETORIUS-IBBA<sup>1</sup>, A. MATZAVINOS<sup>2</sup>, AND B. R. ALEVRIADOU<sup>1</sup><sup>1</sup>The Ohio State University, Columbus, OH, <sup>2</sup>Iowa State University, Ames, IA**PS-8A-4-45** Differential Endothelial Cell Response to Simultaneous Shear and Cytokine StimulationR. B. HUANG<sup>1</sup>, AND O. ENIOLA-ADEFESO<sup>2</sup><sup>1</sup>University of Michigan, Ann Arbor, MI, <sup>2</sup>University of Michigan, Ann Arbor, MI**PS-8A-4-46** Fluid Flow Modulates SMC Marker Gene Expression in 2-D and 3-D via HSPG-Mediated ERK1/2 ActivationZ-D. SHI<sup>1</sup>, AND J. M. TARBELL<sup>1</sup><sup>1</sup>City College and Graduate Center of City University of New York, New York, NY**PS-8A-4-47** High Glucose Attenuates Shear-induced Changes in Endothelial Hydraulic ConductivityS. V. LOPEZ<sup>1</sup>, AND J. M. TARBELL<sup>1</sup><sup>1</sup>The City College of New York -The Graduate Center of CUNY, New York, NY**PS-8A-4-48** Substrate Stretch-induced Actin Edge Ruffling Dynamics in Endothelial CellsL. HUANG<sup>1</sup>, AND B. P. HELMKE<sup>1</sup><sup>1</sup>University of Virginia, Charlottesville, VA**PS-8A-4-49** Biochemical and Biophysical Factors Regulate Inflammation Due to Systemic InfectionS. J. EVANI<sup>1</sup>, N. MAREEDU<sup>1</sup>, A. MURTHY<sup>1</sup>, B. P. ARULANANDAM<sup>1</sup>, AND A. K. RAMASUBRAMANIAN<sup>1</sup><sup>1</sup>University of Texas at San Antonio, San Antonio, TX**PS-8A-4-50** Smooth Muscle Cell Behavior in Non-uniform Stretch EnvironmentsW. J. RICHARDSON<sup>1</sup>, R. P. METZ<sup>2</sup>, E. M. WILSON<sup>2</sup>, AND J. E. MOORE JR.<sup>1</sup><sup>1</sup>Texas A&M University, College Station, TX, <sup>2</sup>Texas A&M Health Science Center, College Station, TX**PS-8A-4-51** Extracellular Matrix Control of Flow-Induced Structural DynamicsR. E. EVANS<sup>1</sup>, AND B. P. HELMKE<sup>1</sup><sup>1</sup>University of Virginia, Charlottesville, VA**PS-8A-4-52** Shear Stress Modulates RAGE Expression and Activation in Human Aortic Endothelial CellsJ. S. DEVERSE<sup>1</sup>, AND A. G. PASSERINI<sup>1</sup><sup>1</sup>University of California, Davis, Davis, CA**Track: Cellular and Molecular Engineering – PS-8A-5**  
**Molecular Engineering****PS-8A-5-53** Quantum Dot Barcodes Expedite Genetic Screening of Infectious DiseasesE. SYKES<sup>1</sup>, S. GIRI<sup>1</sup>, AND W. CHAN<sup>1</sup><sup>1</sup>University of Toronto, Toronto, ON, Canada**PS-8A-5-54** Cholesterol-dependent Phase Separation in Cell Derived Giant Plasma Membrane VesiclesI. LEVENTAL<sup>1</sup>, F. J. BYFIELD<sup>2</sup>, T. BAUMGART<sup>2</sup>, AND P. JANMEY<sup>2</sup><sup>1</sup>Max Planck Institute for Cell Biology and Genetics, Dresden, Germany, <sup>2</sup>University of Pennsylvania, Philadelphia, PA**PS-8A-5-55** Cooperative Effects in the Ordered Assembly of Collagen Layers on MicaW. LEOW<sup>1</sup>, AND W. HWANG<sup>1</sup><sup>1</sup>Texas A&M University, College Station, TX**PS-8A-5-56** Adeno-associated Virus (AAV) Engineering for Enhanced Specificity of Disease-Targeted Viral Gene VectorsJ. JUDD<sup>1</sup>, P. NGUYEN<sup>1</sup>, J. SILBERG<sup>1</sup>, AND J. SUH<sup>1</sup><sup>1</sup>Rice University, Houston, TX**PS-8A-5-57** Real-time Detection of the TRAIL-DR4 Activation Using FRET in a DR4 Reporter Cell LineZ. DERELI-KORKUT<sup>1</sup>, H. GANDHOK<sup>1</sup>, X. JIANG<sup>2</sup>, AND S. WANG<sup>1</sup><sup>1</sup>City College of New York, New York, NY, <sup>2</sup>Memorial Sloan Kettering Cancer Center, New York, NY**PS-8A-5-58** Investigation of a New Method to Improve Dialysis Therapy Using Microencapsulated Biological AgentsR. G. DUQUE<sup>1</sup>, AND M. MOBED-MIREMADI<sup>2</sup><sup>1</sup>San Jose State University, San Jose, CA, <sup>2</sup>San Jose State University, San Jose, CA**PS-8A-5-59** CNT-Oxidoreductase Enzyme Conjugates for Biosensors and Biofuel CellsO. A. KARUNWI<sup>1</sup>, AND A. GUISEPPI-ELIE<sup>2</sup><sup>1</sup>Clemson University, Anderson, SC, Afghanistan, <sup>2</sup>Clemson University, Clemson, SC**PS-8A-5-60** Molecular Biomechanics of the Kinesin Neck Linker DomainS. SHASTRY<sup>1</sup>, AND W. O. HANCOCK<sup>1</sup><sup>1</sup>Penn State University, University Park, PA**PS-8A-5-61** Load-dependent Transport of Sub-Cellular Commodities by Multiple Motor ProteinsD. K. JAMISON<sup>1</sup>, J. W. DRIVER<sup>1</sup>, A. R. ROGERS<sup>1</sup>, P. E. CONSTANTINOU<sup>1</sup>, AND M. R. DIEHL<sup>1</sup><sup>1</sup>Rice University, Houston, TX**PS-8A-5-62** Engineered Peptide Binding ScFv to Chaperone Membrane Protein CrystallizationJ. C. PAI<sup>1</sup>, AND J. A. MAYNARD<sup>1</sup><sup>1</sup>University of Texas at Austin, Austin, TX**PS-8A-5-63** What Governs the Interaction Between Warfarin and Cyclodextrins?J. M. VASQUEZ<sup>1</sup>, S. BAE<sup>2</sup>, B. KIM<sup>2</sup>, G. UPADHYAYULA<sup>1</sup>, S. GUPTA<sup>1</sup>, A. VU<sup>1</sup>, A. HASHEMI<sup>1</sup>, J. S. SCHULTZ<sup>1</sup>, AND V. I. VULLEV<sup>1</sup><sup>1</sup>University of California, Riverside, Riverside, CA, <sup>2</sup>Kyung Hee University, Suwon, Seoul, Korea, Democratic People's Republic of**PS-8A-5-64** A Solvent Exchange Method for Solubilizing and Functionalizing Nanoparticles for *In Vivo* Imaging and Drug Deliver ApplicationsS. TONG<sup>1</sup>, S. HOU<sup>1</sup>, AND G. BAO<sup>1</sup><sup>1</sup>Georgia Institute of Technology, Atlanta, GAPS = Poster Session  
OP = Oral Presentation

**PS-8A-5-65** Exhaustive Sampling of Ribosome Binding Sites for Fast Translation by Ribosome DisplayP. A. BARENDT<sup>1</sup>, AND C. A. SARKAR<sup>1</sup><sup>1</sup>University of Pennsylvania, Philadelphia, PA**PS-8A-5-66** Programming Enzyme-free DNA Reaction Circuits for Ultra Low-cost Molecular DiagnosisX. CHEN<sup>1</sup>, G. ECKHOFF<sup>1</sup>, AND B. LI<sup>1</sup><sup>1</sup>University of Texas at Austin, Austin, TX**PS-8A-5-67** A Versatile Thermally-directed Cross-linking Platform for Facile Modification of Tissue ScaffoldsS. Y. KWAN<sup>1</sup>, L. A. ERNST<sup>1</sup>, S. K. ANDREKO<sup>1</sup>, B. T. BALLOU<sup>1</sup>, AND P. G. CAMPBELL<sup>1</sup><sup>1</sup>Carnegie Mellon University, Pittsburgh, PA**PS-8A-5-68** Quantifying the Tension-lipid Packing Relationship Using Fluorescence Lifetime of DilH. MUDDANA<sup>1</sup>, T. TABOUILLOT<sup>1</sup>, H. CHIANG<sup>1</sup>, AND P. J. BUTLER<sup>1</sup><sup>1</sup>Penn State University, University Park, PA**PS-8A-5-69** Design and Implementation of a FRET-based High-Throughput Screening Technology in SumoylationR. L. MELLO<sup>1</sup>, R. LAUHEAD<sup>1</sup>, Y. SONG<sup>1</sup>, V. MADAHAR<sup>1</sup>, Y. LIU<sup>1</sup>, AND J. LIAO<sup>1</sup><sup>1</sup>University of California Riverside, Riverside, CA**PS-8A-5-70** Coarse-Grained Molecular Dynamics of Myosin II and Structural Dynamics of Nucleotide PocketE. A. KHATIBLOU<sup>1</sup>, S. KREUZER<sup>1</sup>, C-C. LIU<sup>1</sup>, J. MARQUEZ<sup>1</sup>, J. ZHOU<sup>1</sup>, AND T. J. MOON<sup>1</sup><sup>1</sup>UT-Austin, Austin, TX**PS-8A-5-71** Mapping Foldome Changes with Cysteine Labeling Kinetics Measured by Mass SpectrometryB. CHASE<sup>1</sup>, D. PANTANO<sup>2</sup>, J. PAJEROWSKI<sup>3</sup>, H-Y. TANG<sup>4</sup>, D. SPEICHER<sup>4</sup>, AND D. DISCHER<sup>2</sup><sup>1</sup>University of Pennsylvania, Philadelphia, PA, <sup>2</sup>University of Pennsylvania, Philadelphia, PA, <sup>3</sup>Merck, Whitehouse Station, NJ, <sup>4</sup>Wistar Institute, Philadelphia, PA**Track: Devices: Nano to Micro – PS-8A-6****Nano to Micro: Fluidic Technologies****PS-8A-6-72** Benchtop Fabrication of Microfluidic Devices by Soft-Lithographic Replication of Patterned TapeA. B. SHRIRAO<sup>1</sup>, AND R. PEREZ-CASTILLEJOS<sup>1</sup><sup>1</sup>NJIT, Newark, NJ**PS-8A-6-73** Nanofluidic Flow Proteometry for the Determination of Biomarker ConcentrationJ. KAMEOKA<sup>1</sup><sup>1</sup>Texas A&M University, College Station, TX**PS-8A-6-74** Computational and Experimental Techniques to Optimize a Micromixer for an Antibody-based SensorK. L. HAMLINGTON<sup>1</sup>, H. FUJIOKA<sup>1</sup>, D. A. BLAKE<sup>1</sup>, R. CORTEZ<sup>1</sup>, AND D. P. GAVER<sup>1</sup><sup>1</sup>Tulane University, New Orleans, LA**PS-8A-6-75** Push Valve for Microfluidic DevicesM-E. BRETT<sup>1</sup>, S. ZHAO<sup>1</sup>, J. L. STOIA<sup>1</sup>, G. MITTAL<sup>1</sup>, AND D. T. EDDINGTON<sup>1</sup><sup>1</sup>University of Illinois at Chicago, Chicago, IL**PS-8A-6-76** The Effects of RLIP76 on the Migration of CaKi-2 and HMC Cells in Response to HNE and HNEGS. RAO<sup>1</sup>, U. TATA<sup>1</sup>, P. SINGHAL<sup>2</sup>, S. SINGHAL<sup>3</sup>, S. AWASTHI<sup>4</sup>, K. T. NGUYEN<sup>1</sup>, AND J-C. CHIAO<sup>5</sup><sup>1</sup>The Univ. of Texas at Arlington, Arlington, TX, <sup>2</sup>Arlington High School, Arlington, TX, <sup>3</sup>UNT Health Science Center, Fort Worth, TX, <sup>4</sup>UNT Health Science Center, Fort Worth, TX, <sup>5</sup>The Univ. of Texas at Arlington, Arlington, TX**PS-8A-6-77** Migration of PC-3 Cells Under the Influence of Various EGF ConcentrationsS. SALODKAR<sup>1</sup>, U. TATA<sup>1</sup>, S. RAO<sup>1</sup>, K. T. NGUYEN<sup>1</sup>, AND J-C. CHIAO<sup>1</sup><sup>1</sup>The Univ. of Texas at Arlington, Arlington, TX**PS-8A-6-78** Microfluidics Made EasyV. NUÑEZ<sup>1</sup>, B. MILLARE<sup>2</sup>, S. SHIN<sup>1</sup>, K. CHAU<sup>1</sup>, A. LIN<sup>1</sup>, AND V. I. VULLEV<sup>1</sup><sup>1</sup>University of California, Riverside, Riverside, CA, <sup>2</sup>Johns Hopkins University, Baltimore, MD**PS-8A-6-79** Optimizing Microfluidic Devices for Immobilization of *C. elegans* for High-Throughput ScreensI. D. CACERES<sup>1</sup>, AND H. LU<sup>1</sup><sup>1</sup>Georgia Institute of Technology, Atlanta, GA**PS-8A-6-80** Lateral Cavity Acoustic Transducers (LCATs) for Cell and Particle Sorting ApplicationsM. V. PATEL<sup>1</sup>, A. R. TOVAR<sup>1</sup>, R. LIN<sup>1</sup>, S-Y. TEH<sup>1</sup>, AND A. P. LEE<sup>1</sup><sup>1</sup>University of California at Irvine, Irvine, CA**PS-8A-6-81** A Microfluidic Device for Visualization of *E. coli* Transport in a 3-D Tumor ModelN. ELLIOTT<sup>1</sup>, L. YOU<sup>1</sup>, AND F. YUAN<sup>1</sup><sup>1</sup>Duke University, Durham, NC**PS-8A-6-82** Exploiting Osmosis for Size-based Separation of Blood Cells into Subpopulations using MicrofluidicsV. PARICHEHREH<sup>1</sup>, K. K. BHAVANAM<sup>1</sup>, AND P. SETHU<sup>1</sup><sup>1</sup>University of Louisville, Louisville, KY**PS-8A-6-83** A Novel, High-Throughput, Single-Cell Deformability Measurement Technique For Diagnostics And TherapeuticsH. T. TSE<sup>1</sup>, D. R. GOSSETT<sup>1</sup>, S. LEE<sup>1</sup>, A. T. CLARK<sup>1</sup>, AND D. DI CARLO<sup>1</sup><sup>1</sup>University of California, Los Angeles, Los Angeles, CA**PS-8A-6-84** What Determines the Quality of Adhesion between Poly(Dimethylsiloxane) and Glass Surfaces?K. CHAU<sup>1</sup>, B. MILLARE<sup>2</sup>, A. P. LIN<sup>1</sup>, V. NUÑEZ<sup>1</sup>, AND V. I. VULLEV<sup>1</sup><sup>1</sup>University of California, Riverside, Riverside, CA, <sup>2</sup>Johns Hopkins University, Baltimore, MD**PS-8A-6-85** A Switchable Microfluidic Serial Dilution Circuit for Constant Flow Rate Tissue PerfusionA. K. AU<sup>1</sup>, H. A. ARNSON<sup>2</sup>, C. G. SIP<sup>1</sup>, T. E. HOLY<sup>2</sup>, AND A. FOLCH<sup>1</sup><sup>1</sup>University of Washington, Seattle, WA, <sup>2</sup>Washington University in St. Louis, St. Louis, MO**PS-8A-6-86** Nanoscale Diffusivity Measurement DeviceJ. S. GILL<sup>1</sup>, A. GRATTONI<sup>1</sup>, A. ZIEMYS<sup>1</sup>, AND M. FERRARI<sup>1,2</sup><sup>1</sup>University of Texas at Houston Medical School, Houston, TX, <sup>2</sup>University of Texas M.D. Anderson Cancer Center, Houston, TX**PS-8A-6-87** Increased Viscosity for Decreased Settling in Microfluidic Circulating Tumor Cell DiagnosticsC. LAUNIERE<sup>1</sup>, S. HONG<sup>1</sup>, AND D. EDDINGTON<sup>1</sup><sup>1</sup>University of Illinois at Chicago, Chicago, IL**PS-8A-6-88** Automated Dielectrophoretic Characterization of MycobacteriaC. HUANG<sup>1</sup>, B. G. HAWKINS<sup>1</sup>, S. ARASANIPALAI<sup>1</sup>, AND B. J. KIRBY<sup>1</sup><sup>1</sup>Cornell University, Ithaca, NY**PS-8A-6-89** Cell Dosing on Subsecond Time Scales Using a Laminar-Flow DeviceM. M. ROBINSON<sup>1</sup>, S. MOORJANI<sup>1</sup>, T. HOPPE<sup>1</sup>, AND J. B. SHEAR<sup>1</sup><sup>1</sup>University of Texas at Austin, Austin, TX**PS-8A-6-90** Measurement and Regulation of On-Chip Oxygen Partial PressureP. C. THOMAS<sup>1,2</sup>, S. R. RAGHAVAN<sup>2</sup>, AND S. P. FORRY<sup>1</sup><sup>1</sup>National Institute of Standard and Technology, Gaithersburg, MD, <sup>2</sup>University of Maryland, College Park, MD

**PS-8A-6-91** Characterization of Microfluidic Calorimeter for Measuring Small Dynamic Temperature ChangesV. L. KOPPARTHY<sup>1</sup>, S. M. TANGUTOORU<sup>1</sup>, R. GUMMA<sup>1</sup>, G. G. NESTOROVA<sup>1</sup>, AND E. J. GUILBEAU<sup>1</sup><sup>1</sup>Louisiana Tech University, Ruston, LA**PS-8A-6-92** Fluid Flow Characterization of Micro- and Nanochanneled Silicon MembranesE. ZABRE<sup>1</sup>, J. GILL<sup>1</sup>, A. GRATTONI<sup>1</sup>, A. ZIEMYS<sup>1</sup>, AND M. FERRARI<sup>1,2</sup><sup>1</sup>University of Texas Health Science Center at Houston, Houston, TX, <sup>2</sup>University of Texas MD Anderson Cancer Center, Houston, TX**PS-8A-6-93** Towards an Order-of-magnitude Increase in Throughput of Small Artery InvestigationS. PINTO<sup>1</sup>, S. YASOTHARAN<sup>1</sup>, J. VOIGTLÄNDER-BOLZ<sup>2</sup>, S-S. BOLZ<sup>1</sup>, AND A. GÜNTHER<sup>1</sup><sup>1</sup>University of Toronto, Toronto, Ontario, Canada, <sup>2</sup>St. Michael's Hospital, Toronto, Ontario, Canada**PS-8A-6-94** A Novel Microfluidic Assay for Study of Chemotaxis ResponseM. A. TRAORE<sup>1</sup>, AND B. BEHKAM<sup>1</sup><sup>1</sup>Virginia Tech, Blacksburg, VA**PS-8A-6-95** Droplet Microfluidic System for Biodetection and Cell Growth Studies Using a Hydrodynamic SensorI. SINN<sup>1</sup>, P. KINNUNEN<sup>1</sup>, B. H. MCNAUGHTON<sup>1</sup>, M. A. BURNS<sup>1</sup>, AND R. KOPELMAN<sup>1</sup><sup>1</sup>University of Michigan, Ann Arbor, MI**PS-8A-6-96** A Miniaturized Device for Non-Destructive Detection of Radiation Damaged CellsB. PRABHAKARPANDIAN<sup>1</sup>, K. BHATT<sup>1</sup>, M. ACHARY<sup>2</sup>, M. F. KIANI<sup>2</sup>, AND K. PANT<sup>1</sup><sup>1</sup>CFD Research Corporation, Huntsville, AL, <sup>2</sup>Temple University, Philadelphia, PA**PS-8A-6-97** Micro-Sandwich in Microfluidics: 3D Biopolymer Membranes for Cell AssemblyX. LUO<sup>1</sup>, H-C. WU<sup>1</sup>, C-Y. TSAO<sup>1</sup>, Y. CHENG<sup>1</sup>, R. GHODSSI<sup>1</sup>, G. F. PAYNE<sup>1</sup>, G. RUBLOFF<sup>1</sup>, AND W. E. BENTLEY<sup>1</sup><sup>1</sup>University of Maryland, College Park, MD**PS-8A-6-98** Mixing Enhancement in Microfluidic Devices Utilizing Contactless Dielectrophoresis (cDEP)A. SALMANZADEH-DOZDABI<sup>1</sup>, H. SHAFIEE<sup>1</sup>, R. V. DAVALOS<sup>1</sup>, AND M. A. STREMLER<sup>1</sup><sup>1</sup>Virginia Polytechnic Institute and State University, Blacksburg, VA**PS-8A-6-99** 3-D Numerical Simulation of Lateral Migration of Cells and Deformable Particles in Shear FlowH. LAN<sup>1</sup>, AND D. B. KHISMATULLIN<sup>1</sup><sup>1</sup>Tulane University, New Orleans, LA**PS-8A-6-100** A Planar Peristaltic Pump for MicrofluidicsP. GOULD<sup>1</sup>, L. HOANG<sup>1</sup>, K. SEALE<sup>1</sup>, S. DARBY<sup>1</sup>, M. MOORE<sup>2</sup>, AND J. WIKSWO<sup>1</sup><sup>1</sup>Vanderbilt University, Nashville, TN, <sup>2</sup>Sewanee: The University of the South, Sewanee, TN**PS-8A-6-101** Enlarging from Microscale: A Milli-scale Device for Blood and Plasma FractionationV. BHAL<sup>1</sup>, AND E. C. ECKSTEIN<sup>1</sup><sup>1</sup>University of Memphis, Memphis, TN**PS-8A-6-102** The Influence of Microfluidic Channel Height on Leukocyte Adhesion and Rolling Under FlowP. W. COGHILL<sup>1</sup>, E. A. SHIMP<sup>1</sup>, E. K. KESSELHUTH<sup>1</sup>, AND D. W. SCHMIDTKE<sup>1</sup><sup>1</sup>University of Oklahoma, Norman, OK**PS-8A-6-103** Integrated Nanofluidic Channel Device for Biomimic ApplicationsY-T. T. YEH<sup>1</sup>, AND S. ZHENG<sup>1</sup><sup>1</sup>Pennsylvania State University, University Park, PA**PS-8A-6-104** Investigation of Multivalent Ion Solution Flow Reversal under Travelling Wave ElectroosmosisZ. WANG<sup>1</sup>, X. LIU<sup>2</sup>, L. BROUSSEAU<sup>2</sup>, AND M. FERRARI<sup>2</sup><sup>1</sup>the University of Texas at Austin, Austin, TX, <sup>2</sup>University of Texas Health Science Center at Houston, Houston, TX**PS-8A-6-105** High-Throughput Sheathless Flow Cytometry Using Inertial MicrofluidicsA. S. BHAGAT<sup>1</sup>, S. S. KUNTAEGOWDANAHALLI<sup>1</sup>, AND I. PAPAUSKY<sup>1</sup><sup>1</sup>University of Cincinnati, Cincinnati, OH**PS-8A-6-106** Thermoelectric Sensing for Microfluidic DNA Melting AnalysisN. CREWS<sup>1</sup>, AND A. GANVEER<sup>1</sup><sup>1</sup>Louisiana Tech, Ruston, LA**PS-8A-6-107** Modeling of a Microfluidic Magnetic Particle Fractionation DeviceT. O. TASCI<sup>1</sup>, AND B. GALE<sup>1</sup><sup>1</sup>University of Utah, Salt Lake City, UT**Track: Drug Delivery Systems – PS-8A-7****Novel Biomaterials and Scaffolds****PS-8A-7-108** Structure and Application of DNA-Surfactant Films for Stem Cell TransfectionS. GAJRIA<sup>1</sup>, T. NEUMANN<sup>2</sup>, J. WEINSTEIN<sup>2</sup>, D. SCHAFER<sup>2</sup>, AND M. TIRRELL<sup>2</sup><sup>1</sup>UC Santa Barbara, Berkeley, CA, <sup>2</sup>UC Berkeley, Berkeley, CA**PS-8A-7-109** Independent Control of Elasticity and Drug Release Rate of an Injectable Poly(ethylene glycol) Hydrogel for Stem Cell MobilizationY. LIANG<sup>1</sup>, T. W. JENSEN<sup>1</sup>, E. J. ROY<sup>1</sup>, R. J. DEVOLDER<sup>1</sup>, L. A. RUND<sup>1</sup>, K. B. TEXTOR<sup>1</sup>, L. B. SCHOOK<sup>1</sup>, Y. TONG<sup>2</sup>, AND H. KONG<sup>1</sup><sup>1</sup>University of Illinois Urbana-Champaign, Urbana, IL, <sup>2</sup>National University of Singapore, Singapore, Singapore**PS-8A-7-110** A Novel Oral Drug Delivery Carrier: The Effect of Cellulose Nanocrystals on Caco-2 Cell MonolayersK. R. COLACINO<sup>1</sup>, H. WANG<sup>2</sup>, S. DONG<sup>2</sup>, M. ROMAN<sup>2</sup>, AND Y. W. LEE<sup>1</sup><sup>1</sup>Virginia Tech-Wake Forest University, Blacksburg, VA, <sup>2</sup>Virginia Polytechnic Institute and State University, Blacksburg, VA**PS-8A-7-111** Polymeric Platform for Oral Drug Delivery of ChemotherapeuticsC. A. SCHOENER<sup>1</sup><sup>1</sup>University of Texas at Austin, Austin, TX**PS-8A-7-112** Giant Amphiphiles Toward Monodispersed, Stable Nanoparticles for Drug Delivery and ImagingH. DONG<sup>1</sup>, J. Y. SHU<sup>1</sup>, S. LIU<sup>1</sup>, AND T. XU<sup>1</sup><sup>1</sup>University of California at Berkeley, Berkeley, CA**PS-8A-7-113** Modification of Porous Silicon Particles for Enhanced Protein StabilityE. U. DE ROSA<sup>1</sup>, D. FAN<sup>1</sup>, C. CHIAPPINI<sup>2</sup>, X. LIU<sup>1,3</sup>, M. FERRARI<sup>1,4</sup>, AND E. TASCOTTI<sup>1</sup><sup>1</sup>University of Texas HSCH, Houston, TX, <sup>2</sup>University of Texas Austin, Austin, TX, <sup>3</sup>University of Texas Austin, Austin, TX, <sup>4</sup>Rice University, Houston, TX**PS-8A-7-114** Use of Phosphonic Acid Self-assembled Monolayers for Attachment of Vascular Endothelial Growth Factor to Hydroxyapatite SurfacesK. D. ARGEN<sup>1</sup>, G. MANI<sup>1</sup>, N. TORRES<sup>1</sup>, AND J. L. ONG<sup>1</sup><sup>1</sup>University of Texas at San Antonio, San Antonio, TX**PS-8A-7-115** Novel IR820-PEG-Diamine Nanoparticles for Combined Imaging and Therapy: *In Vitro* StudiesA. FERNANDEZ-FERNANDEZ<sup>1</sup>, R. MANCHANDA<sup>1</sup>, T. LEI<sup>1</sup>, D. A. CARVAJAL<sup>1</sup>, AND A. J. MCGORON<sup>1</sup><sup>1</sup>Florida International University, Miami, FL

**PS-8A-7-116** Examination of Folate-Targeted Liposomes With Encapsulated Poly(2-propylacrylic acid) as a pH-responsive Nanoplatfrom for Cytosolic Drug DeliveryZ. CHENG<sup>1</sup><sup>1</sup>University of Pennsylvania, Philadelphia, PA**PS-8A-7-117** Chitosan Microparticles for Drug Delivery ApplicationsL. RODRIGUEZ<sup>1</sup>, A. NADARAJAH<sup>1</sup>, AND N. CHIAIA<sup>1</sup><sup>1</sup>The University of Toledo, Toledo, OH**PS-8A-7-118** Mesoporous Silicon Microparticles for the Sustained Delivery of AntibioticsI. YAZDI<sup>1</sup>, C. CHIAPPINI<sup>2</sup>, B. WEINER<sup>3</sup>, E. TASCIOTTI<sup>1</sup>, AND M. FERRARI<sup>1,2</sup><sup>1</sup>The University of Texas Health Science Center at Houston, Houston, TX, <sup>2</sup>The University of Texas at Austin, Austin, TX, <sup>3</sup>The Methodist Hospital Research Institute, Houston, TX**PS-8A-7-119** Ultrasonic Nebulization as a Tool for Creating Multilayered, Multicomponent NanoassembliesD. MILLS<sup>1</sup>, Y. LVOV<sup>1</sup>, K. MCNAMARA<sup>1</sup>, AND M. THANGARAJ<sup>1</sup><sup>1</sup>Louisiana Tech University, Ruston, LA**PS-8A-7-120** A Novel Dual-agent Loaded PLGA Nanoparticle for the Simultaneous Delivery of Chemotherapy and HyperthermiaY. TANG<sup>1</sup>, T. LEI<sup>1</sup>, R. MANCHANDA<sup>1</sup>, A. NAGESSETTI<sup>1</sup>, A. FERNANDEZ-FERNANDEZ<sup>1</sup>, AND A. J. MCGORON<sup>1</sup><sup>1</sup>Florida International University, Miami, FL**PS-8A-7-121** Synthesis of a Thermally Responsive Curcumin Conjugate for Treating Intervertebral Disc PathologiesS. M. SINCLAIR<sup>1</sup>, D. QU<sup>1</sup>, X. CHEN<sup>1</sup>, E. J. TOONE<sup>1</sup>, A. CHILKOTI<sup>1</sup>, AND L. A. SETTON<sup>1</sup><sup>1</sup>Duke University, Durham, NC**PS-8A-7-122** Model Analysis of Implant Formation and Drug Release from *In Situ* Forming ImplantsR. B. PATEL<sup>1</sup>, G. M. SAIDEL<sup>1</sup>, AND A. A. EXNER<sup>1</sup><sup>1</sup>Case Western Reserve University, Cleveland, OH**PS-8A-7-123** Drug Delivery Potential of Self-Assembled Monolayers on Electropolished L605 Cobalt Chromium AlloyC. R. KAUFMANN<sup>1,2</sup>, G. MANI<sup>2</sup>, AND C. M. AGRAWAL<sup>2</sup><sup>1</sup>University of Texas Health Science Center at San Antonio, San Antonio, TX, <sup>2</sup>University of Texas at San Antonio, San Antonio, TX**PS-8A-7-124** Effect of the Assembling Processes on the Formation of Lipid-protein ComplexesW. HUANG<sup>1</sup>, AND C. ZHANG<sup>1</sup><sup>1</sup>Virginia Tech, Blacksburg, VA**PS-8A-7-125** Dual Functional Thin Film Coating: Microbidal With Controlled Release of A Therapeutic AgentS. Y. WONG<sup>1</sup>, J. S. MOSKOWITZ<sup>1</sup>, R. C. SMITH<sup>1</sup>, J. VESELINOVIC<sup>1</sup>, R. A. ROSARIO<sup>1</sup>, K. TIMACHOVA<sup>1</sup>, M. R. BLAISE<sup>1</sup>, A. M. KLIVANOV<sup>1</sup>, AND P. T. HAMMOND<sup>1</sup><sup>1</sup>Massachusetts Institute of Technology, Cambridge, MA**PS-8A-7-126** Nano-micro Carrier Systems for Sustained Pulmonary Drug DeliveryI. M. EL-SHERBINY<sup>1</sup>, AND H. D. SMYTH<sup>2</sup><sup>1</sup>University of Texas, Austin, TX, <sup>2</sup>University of Texas at Austin, Austin, TX**PS-8A-7-127** The Effect of Hydrophobic Chain Length on the Toxicity of Block Copolyptide VesiclesU-J. CHOE<sup>1</sup>, A. R. RODRIGUEZ<sup>1</sup>, J-K. Y. TAN<sup>1</sup>, W. LOU<sup>1</sup>, T. J. DEMING<sup>1</sup>, AND D. T. KAMEI<sup>1</sup><sup>1</sup>UCLA, Los Angeles, CA**PS-8A-7-128** Dexamethasone Modified Self Assembled Monolayers on Smooth and Rough CoCr: An *In Vitro* Study for Drug DeliveryW. FAN<sup>1</sup>, G. MANI<sup>1</sup>, J. LUO<sup>2</sup>, D. MARTON<sup>1,2</sup>, E. A. SPRAGUE<sup>1,2</sup>, M. D. FELDMAN<sup>1,2</sup>, AND M. AGRAWAL<sup>1</sup><sup>1</sup>University of Texas at San Antonio, San Antonio, TX, <sup>2</sup>University of Texas Health Science Center at San Antonio, San Antonio, TX**PS-8A-7-129** Boronic Acid Based Microparticulate Insulin Delivery SystemI. DASGUPTA<sup>1</sup>, M. SRIVASTAVA<sup>1</sup>, E. TANIFUM<sup>1</sup>, AND A. ANNAPRAGADA<sup>1</sup><sup>1</sup>The University of Texas Health Science Centre at Houston, Houston, TX**PS-8A-7-130** Multistage Delivery of PI3K/mTOR Inhibitor-containing Nanoparticles for Breast Cancer TreatmentE. BLANCO<sup>1</sup>, J. O. MARTINEZ<sup>1</sup>, T. SANGAI<sup>2</sup>, F. MERIC-BERNSTAM<sup>2</sup>, AND M. FERRARI<sup>1</sup><sup>1</sup>University of Texas Health Science Center at Houston, Houston, TX, <sup>2</sup>University of Texas MD Anderson Cancer Center, Houston, TX**PS-8A-7-131** Nanoporous Silicon Particles With Tailored Features for Controlled BiodegradationJ. O. MARTINEZ<sup>1</sup>, C. CHIAPPINI<sup>2</sup>, X. LIU<sup>1</sup>, M. FERRARI<sup>1,3</sup>, AND E. TASCIOTTI<sup>1</sup><sup>1</sup>The University of Texas Health Science Center, Houston, TX, <sup>2</sup>The University of Texas - Austin, Austin, TX, <sup>3</sup>The University of Texas MD Anderson Cancer Center, Houston, TX**PS-8A-7-132** Development and Characterization of Fast-acting Microspheres for Thrombolytic TherapyH. X. NGUYEN<sup>1</sup>, AND E. A. O'REAR<sup>1</sup><sup>1</sup>University of Oklahoma, Norman, OK**PS-8A-7-133** Pertussis Toxin Stability within a Nanofibrous Whooping Cough Vaccine PatchA. SHTEYMAN<sup>1</sup>, K. SAWICKA<sup>2</sup>, AND S. SIMON<sup>2</sup><sup>1</sup>Stony Brook University, Brooklyn, NY, <sup>2</sup>Stony Brook University, Stony Brook, NY**PS-8A-7-134** Calcium Carbonate Coprecipitation for Ibl Nanocapsule Drug Delivery SystemM-M. KELLEY<sup>1</sup>, S. M. SHIELS<sup>1</sup>, AND M. R. APPLEFORD<sup>1</sup><sup>1</sup>University of Texas at San Antonio, San Antonio, TX**PS-8A-7-135** Creation of Multifunctional Nanoparticle Systems for Cancer Therapy using Layer-by-layer AssemblyZ. POON<sup>1</sup>, AND P. T. HAMMOND<sup>1</sup><sup>1</sup>MIT, Cambridge, MA**Track: Neural Engineering – PS-8A-8****Motor Neural Prosthetics****PS-8A-8-136** Smart Floating Light Activated Micro-Electrical Stimulators with Independent Channel SelectionD. S. FREEDMAN<sup>1</sup>, P. S. SPUHLER<sup>1</sup>, E. CEVIK<sup>1</sup>, M. SAHIN<sup>2</sup>, AND M. S. UNLU<sup>1</sup><sup>1</sup>Boston University, Boston, MA, <sup>2</sup>New Jersey Institute of Technology, Newark, NJ**PS-8A-8-137** A 64-Site Three-Dimensional Folded Electrode Array Using Planar FabricationSR. M-E. MERRIAM<sup>1</sup>, O. SRIVANNAVIT<sup>1</sup>, AND K. D. WISE<sup>1</sup><sup>1</sup>University of Michigan, Ann Arbor, MI**PS-8A-8-138** A Biodegradable Regenerative Peripheral Neural InterfaceD. LEWITUS<sup>1</sup>, J. R. VOGELSTEIN<sup>2</sup>, Z. GEHUA<sup>3</sup>, C. YOUNGSEOK<sup>3</sup>, J. KOHN<sup>1</sup>, S. HARSHBARGER<sup>2</sup>, AND X. JIA<sup>3</sup><sup>1</sup>Rutgers University, Piscataway, NJ, <sup>2</sup>The Johns Hopkins University Applied Physics Laboratory, Laurel, MD, <sup>3</sup>Johns Hopkins University School of Medicine, Baltimore, MD**PS-8A-8-139** Wavelength Selective Floating Light Activated Micro-Electrical Neurostimulators (FLAMES)E. CEVIK<sup>1</sup>, D. S. FREEDMAN<sup>1</sup>, P. S. SPUHLER<sup>1</sup>, M. SAHIN<sup>2</sup>, AND M. S. UNLU<sup>1</sup><sup>1</sup>Boston University, Boston, MA, <sup>2</sup>New Jersey Institute of Technology, Newark, NJ**PS-8A-8-140** EMG-Based Neural Network Control of Prosthetic LimbsC. PULLIAM<sup>1</sup>, AND R. KIRSCH<sup>1</sup><sup>1</sup>Case Western Reserve University, Cleveland, OH**PS-8A-8-141** Development of an Osseo-Magnetic Link for Intuitive Rotational Control of Upper Limb ProsthesesE. J. ROUSE<sup>1</sup>, D. C. NAHLIK<sup>1</sup>, M. A. PESHKIN<sup>2</sup>, AND T. A. KUIKEN<sup>1,3</sup><sup>1</sup>Northwestern University, Chicago, IL, <sup>2</sup>Northwestern University, Evanston, IL, <sup>3</sup>Rehabilitation Institute of Chicago, Chicago, IL

**PS-8A-8-142** Data Fusion for Lower Limb Prosthesis Locomotion Mode Detection

E. J. ROUSE<sup>1</sup>, A. J. YOUNG<sup>1</sup>, C. SHIROTA<sup>1,2</sup>, C. J. GRIFFITH<sup>1</sup>, AND L. J. HARGROVE<sup>1,3</sup>  
<sup>1</sup>Northwestern University, Chicago, IL, <sup>2</sup>Ministry of Education of Brazil, Brasília, DF, Brazil, <sup>3</sup>Rehabilitation Institute of Chicago, Chicago, IL

**PS-8A-8-143** An Impulse-Based Virtual Prosthesis (IVP) for Neural-Machine Control Development

N. BUNDERSON<sup>1</sup>, AND T. KUIKEN<sup>1</sup>  
<sup>1</sup>Rehabilitation Institute of Chicago, Chicago, IL

**Track: Neural Engineering – PS-8A-9****Neural Control of Movement****PS-8A-9-144** The Effects of Electrode Misalignment on Myoelectric Pattern Recognition

A. J. YOUNG<sup>1</sup>, AND L. HARGROVE<sup>2,3</sup>  
<sup>1</sup>Northwestern University, Evanston, IL, <sup>2</sup>Northwestern University, Chicago, IL, <sup>3</sup>Rehabilitation Institute of Chicago, Chicago, IL

**PS-8A-9-145** The Effect of Increased Inertia on Standing Balance and Balance Recovery

K. E. COSTELLO<sup>1</sup>, S. L. MATRANGOLA<sup>1</sup>, AND M. L. MADIGAN<sup>2</sup>  
<sup>1</sup>Virginia Tech-Wake Forest, Blacksburg, VA, <sup>2</sup>Virginia Tech, Blacksburg, VA

**PS-8A-9-146** An EMG Based Continuous Adaptive Controller for Upper Extremity Neuroprostheses

M. IORIO<sup>1</sup>, AND R. KIRSCH<sup>1</sup>  
<sup>1</sup>Case Western Reserve University, Cleveland, OH

**PS-8A-9-147** Human Postural Control System Responses When Perturbed With Frequencies Near That of Normal Sway

V. BHATKAR<sup>1</sup>  
<sup>1</sup>Clarkson University, Potsdam, NY

**PS-8A-9-148** Empirical Mode Decomposition/ Hilbert Transform Analysis of Induced Postural Oscillations

R. B. PILKAR<sup>1</sup>, E. M. BOLLT<sup>1</sup>, AND C. J. ROBINSON<sup>1,2</sup>  
<sup>1</sup>Clarkson University, Potsdam, NY, <sup>2</sup>Syracuse VA Medical Center, Syracuse, NY

**PS-8A-9-149** Dimensionality Reduction in Primate Motor Cortex During Dexterous Grasps

V. AGGARWAL<sup>1</sup>, M. MOLLAZADEH<sup>1</sup>, A. DAVIDSON<sup>2</sup>, A. CHENG<sup>1</sup>, M. H. SCHIEBER<sup>2</sup>, AND N. THAKOR<sup>1</sup>  
<sup>1</sup>Johns Hopkins University, Baltimore, MD, <sup>2</sup>University of Rochester, Rochester, NY

**Track: Neural Engineering – PS-8A-10****Neural Electrode Tissue Interface****PS-8A-10-150** 2-D and 3-D Lattice Probes for Mitigating Chronic Reaction in Brain Tissue

SR. M-E. MERRIAM<sup>1</sup>, J. SKOUSEN<sup>2</sup>, O. SRIVANNAVIT<sup>1</sup>, P. A. TRESKO<sup>2</sup>, AND K. D. WISE<sup>1</sup>  
<sup>1</sup>University of Michigan, Ann Arbor, MI, <sup>2</sup>University of Utah, Salt Lake City, UT

**PS-8A-10-151** Real-Time Imaging of Intracortical Inflammation at the Device-Tissue Interface

B. GUI<sup>1</sup>, J. R. CAPADONA<sup>1,2</sup>, AND J. P. BASILION<sup>1,3</sup>  
<sup>1</sup>Case Western Reserve University, Cleveland, OH, <sup>2</sup>Cleveland Veteran Affairs Medical Center, Cleveland, OH, <sup>3</sup>National Foundation for Cancer Research, Cleveland, OH

**PS-8A-10-152** Novel Degradable Polymer Carrier for Cortical Neural Probes

D. LEWITUS<sup>1</sup>, K. SMITH<sup>2</sup>, W. SHAIN<sup>2</sup>, AND J. KOHN<sup>1</sup>  
<sup>1</sup>Rutgers University, Piscataway, NJ, <sup>2</sup>Wadsworth Center, Albany, NY

**PS-8A-10-153** CNT-Modified Electrode Sites for *In Vitro* and *In Vivo* Silicon Probe Studies

SR. M-E. MERRIAM<sup>1</sup>, O. SRIVANNAVIT<sup>1</sup>, M. J. ROBERTS<sup>1</sup>, Y. ZHANG<sup>1</sup>, N. K. DHINGRA<sup>1</sup>, A. J. HART<sup>1</sup>, AND K. D. WISE<sup>1</sup>  
<sup>1</sup>University of Michigan, Ann Arbor, MI

**PS-8A-10-154** Targeted Electrical Stimulation for Excitation of Selective Neuronal Populations

M. L. KUYKENDAL<sup>1</sup>, G. S. GUVANASEN<sup>1</sup>, M. A. GROVER<sup>1</sup>, S. M. POTTER<sup>1</sup>, AND S. P. DEWEERTH<sup>1</sup>  
<sup>1</sup>Georgia Institute of Technology, Atlanta, GA

**PS-8A-10-155** Mechanical Properties of Brain Structures; Implications for Compliant Electrodes

B. MORRISON<sup>1</sup>, AND B. S. ELKIN<sup>1</sup>  
<sup>1</sup>Columbia University, New York, NY

**PS-8A-10-156** Assessment of Tissue Response in Push Pull Perfusion for Neurochemical/Electrophysiological Sensing

D. E. CEPEDA<sup>1</sup>, L. H. HAINS<sup>2</sup>, K. L. SMITH<sup>2</sup>, W. SHAIN<sup>2</sup>, AND R. T. KENNEDY<sup>1</sup>  
<sup>1</sup>University of Michigan, Ann Arbor, MI, <sup>2</sup>Wadsworth Center, Albany, NY

**PS-8A-10-157** Macrostimulation through the Microelectrode Guide Cannula During DBS Implantation

J. RAKKAR<sup>1</sup>, K. MEWES<sup>2</sup>, C. D. ESPER<sup>2</sup>, M. R. DELONG<sup>2</sup>, AND R. E. GROSS<sup>2</sup>  
<sup>1</sup>Georgia Institute of Technology, Atlanta, GA, <sup>2</sup>Emory University, Atlanta, GA

**PS-8A-10-158** Characterization of Tissue at Intracortical Microelectrode Interfaces Using *In Vitro*, *In Situ* and *In Vivo* Imaging Strategies.

A. J. WOOLLEY<sup>1</sup>, H. DESAI<sup>1</sup>, M. A. STECKBECK<sup>1</sup>, N. ONUNKWO<sup>1</sup>, N. PATEL<sup>1</sup>, S. SOMMAKIA<sup>1</sup>, AND K. J. OTTO<sup>1</sup>  
<sup>1</sup>Purdue University, West Lafayette, IN

**Track: New Frontiers in Bioengineering – PS-8A-11****Immunobioengineering****PS-8A-11-159** Effects of Fc Density on Phagocytosis of Functionalized Microparticles for Use in Immunotherapies

P. M. PACHECO<sup>1</sup>, N. O. ENEMCHUKWU<sup>1</sup>, T. A. SULCHEK<sup>1</sup>, D. WHITE<sup>2</sup>, AND A. J. GARCIA<sup>1</sup>  
<sup>1</sup>Georgia Institute of Technology, Atlanta, GA, <sup>2</sup>Centers for Disease Control and Prevention, Atlanta, GA

**PS-8A-11-160** Enhancing Transfection Efficiency of Lipopolyplexes via a "Soft-Core" Approach

K. PHUA<sup>1</sup>, C. GRIGSBY<sup>1</sup>, AND K. LEONG<sup>1</sup>  
<sup>1</sup>Duke University, Durham, NC

**PS-8A-11-161** Design Algorithm for making Non-Immunogenic Proteins

S. C. LEE<sup>1</sup>  
<sup>1</sup>The Ohio State University, Columbus, OH

**PS-8A-11-162** Antibody Responses to Nanodevices and a Design Algorithm for Their Mitigation

S. C. LEE<sup>1</sup>  
<sup>1</sup>The Ohio State University, Columbus, OH

**PS-8A-11-163** Clustering of Stimuli on Single-Walled Carbon Nanotube Bundles Enhances Cellular Activation

T. R. FADEL<sup>1</sup>, M. LOOK<sup>2</sup>, G. HALLER<sup>2</sup>, L. PFEFFERLE<sup>2</sup>, AND T. FAHMY<sup>2</sup>  
<sup>1</sup>Yale Univ, New Haven, CT, <sup>2</sup>Yale University, New Haven, CT

**PS-8A-11-164** High-throughput Particle Production & Antigen Presenting Cell Arrays for Particle Vaccine Optimization

A. P. ACHARYA<sup>1</sup>, N. DOLGOVA<sup>1</sup>, J. S. LEWIS<sup>1</sup>, T. ZAVERI<sup>1</sup>, M. R. CARSTENS<sup>1</sup>, C-Q. XIA<sup>2</sup>, M. J. CLARE-SALZLER<sup>2</sup>, AND B. G. KESELOWKSY<sup>1</sup>  
<sup>1</sup>Pruitt Family Department of Biomedical Engineering, University of Florida, Gainesville, FL, <sup>2</sup>Department of Pathology, University of Florida, Gainesville, FL



**PS-8A-11-165** Design of Potent Complement Inhibitors of the Compstatin FamilyD. MORIKIS<sup>1</sup>, A. LOPEZ DE VICTORIA<sup>1</sup>, R. GORHAM<sup>1</sup>, M. L. BELLOWS<sup>2</sup>, P. TAMAMIS<sup>3</sup>, G. ARCHONTIS<sup>3</sup>, D. D. LO<sup>1</sup>, AND C. A. FLOUDAS<sup>2</sup><sup>1</sup>University of California, Riverside, Riverside, CA, <sup>2</sup>Princeton University, Princeton, NJ, <sup>3</sup>University of Cyprus, Nicosia, Cyprus**PS-8A-11-166** Control of Inflammation Using Spatially Immobilized CytokinesS. Y. KWAN<sup>1</sup>, S. K. ANDREKO<sup>1</sup>, L. L. SCHULTZ<sup>1</sup>, L. E. WEISS<sup>1</sup>, B. T. BALLOU<sup>1</sup>, X. X. ZHENG<sup>2</sup>, AND P. G. CAMPBELL<sup>1</sup><sup>1</sup>Carnegie Mellon University, Pittsburgh, PA, <sup>2</sup>University of Pittsburgh Medical Center, Pittsburgh, PA**PS-8A-11-167** Targeted, Immuno-suppressive Microparticles Modify Dendritic Cell Behavior and Induce Foxp3+ Tregs.J. LEWIS<sup>1</sup>, N. DOLGOVA<sup>1</sup>, C. XIA<sup>1</sup>, M. CLARE-SALZLER<sup>1</sup>, AND B. KESELOWSKY<sup>1</sup><sup>1</sup>University of Florida, Gainesville, FL**PS-8A-11-168** Relationship Between Antigen Binding Affinity and Neutralization Potency of Antibodies Against SARS-COV StrainsM. RANI<sup>1</sup>, R. BARIC<sup>2</sup>, B. IVERSON<sup>1</sup>, AND G. GEORGIU<sup>1</sup><sup>1</sup>UT Austin, Austin, TX, <sup>2</sup>UNC, Chapel hill, NC**PS-8A-11-169** Distinct Mechanics of Neutrophil Phagocytosis of Fungal Particles and Antibody-coated TargetsC-Y. LEE<sup>1</sup>, M. HERANT<sup>2</sup>, S. M. JOHNSON<sup>1</sup>, D. PAPPAGIANIS<sup>1</sup>, AND V. HEINRICH<sup>1</sup><sup>1</sup>University of California, Davis, CA, <sup>2</sup>Boston University, Boston, MA**PS-8A-11-170** Inducing Immune Tolerance Using a Material to Program Dendritic CellsC. VERBEKE<sup>1</sup>, AND D. MOONEY<sup>1,2</sup><sup>1</sup>Harvard University, Cambridge, MA, <sup>2</sup>Wyss Institute, Boston, MA**Track: Orthopedic and Rehabilitation Engineering – PS-8A-12****Rehabilitation Engineering****PS-8A-12-171** Evaluation of an Optimized Control Strategy for a Low-Cost Prosthetic HandC. F. PASLUOSTA<sup>1</sup>, AND A. W. CHIU<sup>1</sup><sup>1</sup>Louisiana Tech University, Ruston, LA**PS-8A-12-172** Closed Loop Non-Invasive Human-Robot Interaction: Temperature Sensitive Bionic FingerB. TEPLITZKY<sup>1</sup>, V. J. SANTOS<sup>1</sup>, AND S. HELMS TILLERY<sup>1</sup><sup>1</sup>Arizona State University, Tempe, AZ**PS-8A-12-173** Quantification of Maximum Neck Range of Motion in Assessment of Patient Peripheral VisionB. L. ROACH<sup>1</sup>, J. MCKEE<sup>1</sup>, R. R. GOODENOUGH<sup>1</sup>, J. O. BROOKS<sup>1</sup>, AND J. D. DESJARDINS<sup>1</sup><sup>1</sup>Clemson University, Clemson, SC**PS-8A-12-174** The Design and Evaluation of a Three-Variable Vibrotactile Feedback System for a Myoelectric ArmE. D. SELLERS<sup>1</sup>, AND A. W. CHIU<sup>1</sup><sup>1</sup>Louisiana Tech University, Ruston, LA**PS-8A-12-175** The Effects of Noise and Inertia Distribution During a Planar Reaching TaskH. P. NGUYEN<sup>1</sup>, AND J. DINGWELL<sup>1</sup><sup>1</sup>University of Texas - Austin, Austin, TX**PS-8A-12-176** A Dynamic Walking Model Predicts how Neuromuscular Noise Affects Movement Variability and Fall RiskJ. B. DINGWELL<sup>1</sup>, AND P. E. ROOS<sup>2</sup><sup>1</sup>University of Texas, Austin, TX, <sup>2</sup>University of Texas, Austin, TX**PS-8A-12-177** The Design of Cost Efficient Prosthetic Gripper Spring Powered Rotary (SPR) ProstheticsK. SEYEDMADANI<sup>1</sup>, V. B. PIZZICONI<sup>2</sup>, J. MUTHUSWAMY<sup>2</sup>, AND S. I. HELMS TILLERY<sup>2</sup><sup>1</sup>Arizona State University, Paradise Valley, AZ, <sup>2</sup>Arizona State University, Tempe, AZ**PS-8A-12-178** Analysis of Amputee Gait Using Virtual Reality Rehabilitation TechniquesM. S. DANGELO<sup>1</sup>, S. KOTOWSKI<sup>2</sup>, D. REYNOLDS<sup>1</sup>, AND S. NARAYANAN<sup>1</sup><sup>1</sup>Wright State University, Dayton, OH, <sup>2</sup>University of Cincinnati, Cincinnati, OH**Track: Orthopedic and Rehabilitation Engineering – PS-8A-13****Skeletal Biomechanics****PS-8A-13-179** Running Stresses in Humans and Ostriches: Reciprocal Insights Into High-performance BipedalityE. SNIVELY<sup>1</sup>, J. COTTON<sup>1</sup>, M. GILBERT<sup>2</sup>, AND R. SISSONS<sup>3</sup><sup>1</sup>Ohio University, Athens, OH, <sup>2</sup>University of Saskatchewan, Saskatoon, SK, Canada, <sup>3</sup>University of Alberta, Edmonton, AB, Canada**PS-8A-13-180** Dynamic Properties of Soft Tissues in Human Ear at Auditory FrequenciesX. ZHANG<sup>1</sup>, D. NAKMALI<sup>1</sup>, AND R. Z. GAN<sup>1</sup><sup>1</sup>University of Oklahoma, Norman, OK**PS-8A-13-181** High-Speed 3D Motion Analysis System for Quantifying Human Subject Kinematics During Frontal Sled TestsS. BEEMAN<sup>1</sup>, A. KEMPER<sup>1</sup>, M. MADIGAN<sup>2</sup>, AND S. DUMA<sup>1</sup><sup>1</sup>Virginia Tech - Wake Forest, Blacksburg, VA, <sup>2</sup>Virginia Tech, Blacksburg, VA**PS-8A-13-182** An Objective Assessment Device For Quantifying Ankle Plantarflexion Muscle Performance During DialysisR. SOANGRA<sup>1</sup>, AND T. E. LOCKHART<sup>1</sup><sup>1</sup>Virginia Tech, Blacksburg, VA**PS-8A-13-183** The Influence of Screw Thread and Tapping on the Fatigue Performance of Pedicle ScrewsA. VALDEVIT<sup>1</sup>, S. LEWIS<sup>2</sup>, J. TURNER<sup>3</sup>, AND A. RITTER<sup>1</sup><sup>1</sup>The Stevens Institute of Technology, Hoboken, NJ, <sup>2</sup>UHN Orthopaedics, Toronto, Ontario, Canada, <sup>3</sup>Medtronic Spinal and Biologics Business, Memphis, TN**PS-8A-13-184** Rib Fracture Timing in Dynamic Belt Tests with Human CadaversA. R. KEMPER<sup>1</sup>, J. D. STITZEL<sup>1</sup>, C. MCNALLY<sup>1</sup>, E. A. KENNEDY<sup>1</sup>, AND S. M. DUMA<sup>1</sup><sup>1</sup>Virginia Tech - Wake Forest University, Center for Injury Biomechanics, Blacksburg, VA**PS-8A-13-185** Dynamic Tensile Material Properties of Human Pelvic Cortical BoneA. R. KEMPER<sup>1</sup>, C. MCNALLY<sup>1</sup>, AND S. DUMA<sup>1</sup><sup>1</sup>Virginia Tech - Wake Forest University, Center for Injury Biomechanics, Blacksburg, VA**PS-8A-13-186** Dynamic Hydraulic Pressure Stimulation-induced Intramedullary Pressure and its Adaptation PotentialY-X. QIN<sup>1</sup>, M. HU<sup>1</sup>, F. SERRA-HSU<sup>1</sup>, S. FERRERI<sup>1</sup>, J. CHENG<sup>1</sup>, Z. ZHANG<sup>1</sup>, Y. HUANG<sup>1</sup>, AND D. EVANGELISTA<sup>1</sup><sup>1</sup>Stony Brook University, Stony Brook, NY**PS-8A-13-187** Relationships between Linear and Angular Head Acceleration from Impact to Human VolunteersS. ROWSON<sup>1</sup>, AND S. M. DUMA<sup>1</sup><sup>1</sup>Virginia Tech, Blacksburg, VA**PS-8A-13-188** Head Accelerations from Baseballs Impacting Catcher's Masks and Implication on InjuryS. ROWSON<sup>1</sup>, K. SHAIN<sup>1</sup>, M. MADIGAN<sup>1</sup>, AND S. M. DUMA<sup>1</sup><sup>1</sup>Virginia Tech, Blacksburg, VA**PS-8A-13-189** Variances in the Blast-Induced Intracranial Pressure Response Due to Subject OrientationB. A. MATHIE<sup>1</sup>, AND P. J. VANDEVORD<sup>1,2</sup><sup>1</sup>Wayne State University, Detroit, MI, <sup>2</sup>John D Dingell VAMC, Detroit, MI

**Track: Respiratory Engineering – PS-8A-14****Imaging the Lung – The New Frontier****PS-8A-14-190** Automated Segmentation of Asthma Ventilation Defects using Helium-3 Magnetic Resonance ImagingM. HEYDARIAN<sup>1</sup>, S. CHOY<sup>1</sup>, A. WHEATLEY<sup>1</sup>, R. ETEMAD-REZA<sup>2</sup>, D. G. MCCORMACK<sup>2</sup>, AND G. PARRAGA<sup>1,2</sup><sup>1</sup>Robarts Research Institute, London, ON, Canada, <sup>2</sup>University of Western Ontario, London, ON, Canada**PS-8A-14-191** Development of a Pulmonary Surrogate for Blunt to Blast Loading Applications.K. A. DANELSON<sup>1</sup>, F. S. GAYZIK<sup>1</sup>, J. J. HOTH<sup>2</sup>, AND J. D. STITZEL<sup>1</sup><sup>1</sup>Virginia Tech/Wake Forest University SBES, Winston-Salem, NC, <sup>2</sup>Wake Forest University School of Medicine, Winston-Salem, NC**PS-8A-14-192** Challenges Associated with Quantitative Assessment of the Lung with Dual Energy Xe-MDCTM. K. FULD<sup>1</sup>, S. MOBBERLEY<sup>1</sup>, J. MORGAN<sup>1</sup>, J. SIEREN<sup>1</sup>, M. HUDSON<sup>1</sup>, AND E. HOFFMAN<sup>1</sup><sup>1</sup>University of Iowa, Iowa City, IA**Track: Respiratory Engineering – PS-8A-15****Multi-scale Behavior and the Lung****PS-8A-15-193** Coupling of Scales in a Comprehensive Continuum Mechanics Based Computational Lung ModelL. WIECHERT<sup>1</sup>, AND W. WALL<sup>1</sup><sup>1</sup>Technische Universität München, Garching bei München, Bavaria, Germany**PS-8A-15-194** A Study of Artefacts and Their Removal During Forced OscillationS. A. BHATAWADEKAR<sup>1</sup>, Y. CHEN<sup>1</sup>, J. OHISHI<sup>2</sup>, P. HERNANDEZ<sup>1</sup>, T. BROWN<sup>1</sup>, C. MCPARLAND<sup>1</sup>, AND G. N. MAKSYM<sup>1</sup><sup>1</sup>Dalhousie University, Halifax, Nova Scotia, Canada, <sup>2</sup>Tohoku University, Sendai, Miyagi, Japan**PS-8A-15-195** Model-Based Prediction of Exacerbations in AsthmaA. MAJUMDAR<sup>1</sup>, AND B. SUKI<sup>1</sup><sup>1</sup>Boston University, Boston, MA**PS-8A-15-196** Assessment of Metabolic Variation In Sleep ApneaA. BASHABOYINA<sup>1</sup>, D. E. WATENPAUGH<sup>2</sup>, R. ZHANG<sup>3</sup>, G. BHAVE<sup>1</sup>, M. AL-ABED<sup>1</sup>, S. IYER<sup>1</sup>, E. ALTUWAJRI<sup>1</sup>, AND K. . BEHBEHANI<sup>1</sup><sup>1</sup>The University of Texas, Arlington, TX, <sup>2</sup>Sleep Consultants Inc., Ft. Worth, TX, <sup>3</sup>Presbyterian Hospital, Institute for Exercise and Environmental Medicine, Dallas, TX**Track: Systems Biology, Bioinformatics and Computational Biology – PS-8A-16****Modeling of Biomolecules and Their Interactions****PS-8A-16-197** Intra Microfluidic Calcium Cycling and Balance in T CellsS. E. ARNDT<sup>1</sup>, K. T. SEALE<sup>1</sup>, AND C. C. MARASCO<sup>1</sup><sup>1</sup>Vanderbilt University, Nashville, TN**PS-8A-16-198** Calculations of Thermodynamic Effects of Conformational Constraints in Protein-Ligand InteractionsY. SHI<sup>1</sup>, AND P. REN<sup>1</sup><sup>1</sup>The University of Texas at Austin, Austin, TX**PS-8A-16-199** Protein-ligand Binding Free Energy Calculation with the AMOEBA Polarizable Force FieldJ. ZHANG<sup>1</sup>, AND P. REN<sup>1</sup><sup>1</sup>The University of Texas at Austin, Austin, TX**PS-8A-16-200** Selective Binding of Peptides on Conducting PolymersJ. FONNER<sup>1</sup>, C. E. SCHMIDT<sup>1</sup>, AND P. REN<sup>1</sup><sup>1</sup>The University of Texas at Austin, Austin, TX**PS-8A-16-201** Steered Molecular Dynamics Parameters to Study Shear Between Collagen MoleculesA. L. KWANSA<sup>1</sup>, AND J. W. FREEMAN<sup>1</sup><sup>1</sup>Virginia Polytechnic Institute and State University (Virginia Tech), Blacksburg, VA**PS-8A-16-202** Simplifying Rule-based Reaction Networks using Timescale Analysis: The Interleukin-12 Signaling Pathway as an Illustrative ExampleB. DOLLY<sup>1</sup>, AND D. J. KLINKE<sup>1</sup><sup>1</sup>West Virginia University, Morgantown, WV**PS-8A-16-203** Release of Nitric Oxide From Hemoglobin Solution Due to Reaction With Nitrite – A Quantitative AnalysisV. MUTHUJAYAN<sup>1</sup>, B. PIKNOVA<sup>2</sup>, R. N. PITTMAN<sup>3</sup>, A. N. SCHECHTER<sup>2</sup>, AND A. S. POPEL<sup>1</sup><sup>1</sup>Johns Hopkins University, Baltimore, MD, <sup>2</sup>National Institutes of Health, Bethesda, MD, <sup>3</sup>Virginia Commonwealth University, Richmond, VA**PS-8A-16-204** Shape-Based Virtual Screening: The Discovery of a Potent Inhibitor Targeting JNK1-J1P1 InteractionC. YAN<sup>1</sup>, K. N. DALBY<sup>1</sup>, AND P. REN<sup>1</sup><sup>1</sup>the University of Texas at Austin, Austin, TX**PS-8A-16-205** Using the Free-Solvent Model to Predict the Solvent Accessible Surface Area for Globular ProteinsD. W. MCBRIDE<sup>1</sup>, AND V. G. J. RODGERS<sup>1</sup><sup>1</sup>University of California, Riverside, CA**PS-8A-16-206** Modeling of the Effects of Protein Alignment & Orientation on Actin Myosin InteractionC-C. LIU<sup>1</sup>, S. M. KREUZER<sup>1</sup>, E. A. KHATIBLOU<sup>1</sup>, J. D. MARQUEZ<sup>1</sup>, J. ZHOU<sup>1</sup>, AND T. J. MOON<sup>1,2</sup><sup>1</sup>The University of Texas at Austin, Austin, TX, <sup>2</sup>Texas Materials Institute, Austin, TX**PS-8A-16-207** Understanding Protein Preservation in Sugar Glasses via Simulation Study of Fast DynamicsD. S. SIMMONS<sup>1</sup>, M. T. CICERONE<sup>1</sup>, AND J. F. DOUGLAS<sup>1</sup><sup>1</sup>National Institute of Standards and Technology, Gaithersburg, MD**PS-8A-16-208** Modeling of Sustained Protein Release from an Aptamer-Functionalized HydrogelB. SOONTORNWORAJIT<sup>1</sup>, M. KARZAR-JEDDI<sup>1</sup>, Y. WANG<sup>1</sup>, AND T-H. FAN<sup>1</sup><sup>1</sup>University of Connecticut, Storrs, CT**PS-8A-16-209** A Coarse-Grained Model for RNA Molecular Dynamics SimulationZ. XIA<sup>1</sup>, AND P. REN<sup>1</sup><sup>1</sup>The University of Texas at Austin, Austin, TX**PS-8A-16-210** Using Simulation to Study the Effect of Microtubule Dynamics Parameters CategorizationK. Y. KONG<sup>1</sup>, R. MOFFITT<sup>1</sup>, H. KHAN<sup>1</sup>, A. I. MARCUS<sup>2</sup>, AND M. D. WANG<sup>1</sup><sup>1</sup>Georgia Institute of Technology, Atlanta, GA, <sup>2</sup>Emory University, Atlanta, GA**PS-8A-16-211** Discrete and Stochastic Spatiotemporal Models of Reaction-Diffusion using Agent Based ModelingM. AZIMI<sup>1</sup>, Y. JAMALI<sup>1</sup>, AND M. MOFRAD<sup>1</sup><sup>1</sup>UC Berkeley, Berkeley, CA

**PS-8A-16-212** Discrimination of Collagen Denaturation Models Using Parameter EstimationN. T. WRIGHT<sup>1</sup><sup>1</sup>Michigan State University, East Lansing, MI**PS-8A-16-213** Continuum Modeling of Myosin II Subfragment-2 Coiled-coilJ. ZHOU<sup>1</sup>, S. M. KREUZER<sup>1</sup>, E. KHATIBLOU<sup>1</sup>, C-C. LIU<sup>1</sup>, J. D. MARQUEZ<sup>1</sup>, AND T. J. MOON<sup>1</sup><sup>1</sup>University of Texas at Austin, Austin, TX**PS-8A-16-214** Comparative Study of Reranking Methods for Fast Fourier Transform-Based Protein-Protein Docking ProgramsM. MOUSSALEM<sup>1</sup>, R. CHOWDHURY<sup>1</sup>, D. KEIDEL<sup>2</sup>, A. OLSON<sup>2</sup>, M. SANNER<sup>2</sup>, AND C. BAJAJ<sup>1</sup><sup>1</sup>The University of Texas at Austin, Austin, TX, <sup>2</sup>The Scripps Research Institute, La Jolla, CA**PS-8A-16-215** Scalable Integration of Multiple Molecular Pathway ModelsV. AYYADURAI<sup>1</sup>, AND C. F. DEWEY<sup>1</sup><sup>1</sup>M.I.T., Cambridge, MA**PS-8A-16-216** Modified Elastic Network Model Finite Element Analysis of Actin Filament to Study Protein Mechanical Response to LoadJ. D. MARQUEZ<sup>1</sup>, S. KREUZER<sup>1</sup>, E. KHATIBLOU<sup>1</sup>, D. LIU<sup>1</sup>, J. ZHOU<sup>1</sup>, AND T. MOON<sup>1,2</sup><sup>1</sup>The University of Texas at Austin, Austin, TX, <sup>2</sup>Texas Materials Institute, Austin, TX**PS-8A-16-217** Integrative Model of Interferon (IFN) Response to Viral InfectionS. AYYADURAI<sup>1</sup><sup>1</sup>M.I.T., Cambridge, MA**Track:Tissue Engineering - PS-8A-17****Bioinspired Materials****PS-8A-17-218** Analysis of Cellularity and ECM Composition in a Decellularized Vascular ConstructR. J. NAGAO<sup>1</sup>, AND C. E. SCHMIDT<sup>1</sup><sup>1</sup>University of Texas at Austin, Austin, TX**PS-8A-17-219** Independent Tuning of Enzymatically Cleavable starPEG-heparin Hydrogels to Direct Tissue RegenerationK. R. LEVENTAL<sup>1</sup>, M. S. GRIEB<sup>1</sup>, M. V. TSURKAN<sup>1</sup>, K. CHWALEK<sup>1</sup>, U. FREUDENBERG<sup>1</sup>, AND C. WERNER<sup>1</sup><sup>1</sup>Leibniz Institute of Polymer Research Dresden, Dresden, Germany**PS-8A-17-220** Investigation of Biomimetic Folding within PolydepsipeptidesM. M. NGUYEN<sup>1</sup>, J. ZHANG<sup>1</sup>, P. REN<sup>1</sup>, AND L. SUGGS<sup>1</sup><sup>1</sup>University of Texas at Austin, Austin, TX**PS-8A-17-221** Sequential Immobilization of TM and EPCR to create a Biomimetic Vascular SurfaceM. SCHNEIDER<sup>1</sup>, A. SUBRAMANIAN<sup>1</sup>, K. KADOR<sup>1</sup>, AND T. MAMMEDOV<sup>1</sup><sup>1</sup>University of Nebraska, Lincoln, NE**PS-8A-17-222** The Insect Tracheal System As a Microfluidic Pump:A Test Of The Hemolymph Pressure HypothesisL. M. COX<sup>1</sup>, AND J. J. SOCHA<sup>2</sup><sup>1</sup>Virginia Tech, Blacksburg, VA, <sup>2</sup>Virginia Tech, Blacksburg, VA**PS-8A-17-223** Selectable, Tunable Naturally Occurring Nano-materials for Tissue EngineeringL. XIA<sup>1</sup>, S. LENAGHAN<sup>1</sup>, A. WILLS<sup>1</sup>, AND M. ZHANG<sup>1</sup><sup>1</sup>University of Tennessee, Knoxville, TN**PS-8A-17-224** What Makes a Nerve Guidance Feature?-Novel Materials Inspired by Schwann CellsC. Y. LOPEZ-FAGUNDO<sup>1</sup>, AND D. HOFFMAN-KIM, PH.D.<sup>1</sup><sup>1</sup>Brown University, Providence, RI**PS-8A-17-225** Biomimetic Surface Functionalized Poly(Lactic Acid) Fibers for Musculoskeletal Tissue RegenerationJ. D. MURRAY<sup>1</sup>, S. B. VANGORDON<sup>1</sup>, T. B. BLUE<sup>1</sup>, R. L. SHAMBAUGH<sup>1</sup>, P. L. DEANGELIS<sup>2</sup>, AND V. I. SIKAVITSAS<sup>1</sup><sup>1</sup>University of Oklahoma, Norman, OK, <sup>2</sup>University of Oklahoma Health Science Center, Oklahoma City, OK**PS-8A-17-226** Bio-inspired Functionalization and Crosslinking of Hyaluronic Acid via HA-binding PeptideS-Y. CHO<sup>1</sup>, AND C. WANG<sup>1</sup><sup>1</sup>University of Minnesota, Minneapolis, MN**Track:Tissue Engineering - PS-8A-18****Bioreactors and Bioprocessing****PS-8A-18-227** Elucidation of the Bioeffects of Ultrasound on Cells Seeded on ScaffoldsS. NORIEGA<sup>1</sup>, S. GUHA THAKURTA<sup>1</sup>, M. SCHNEIDER<sup>1</sup>, G. BUDDIRAJA<sup>1</sup>, AND A. SUBRAMANIAN<sup>1</sup><sup>1</sup>University of Nebraska, Lincoln, NE**PS-8A-18-228** CANCELED**PS-8A-18-229** Bioreactor Expansion and Differentiation of Adult Side Population Stem CellsD. B. COWAN<sup>1</sup>, I. V. ALPATOV<sup>1</sup>, AND K-R. WANG<sup>1</sup><sup>1</sup>Children's Hospital Boston and Harvard Medical School, Boston, MA**PS-8A-18-230** A Novel Mechano-Active Biaxial Stretcher for Engineering Planar TissuesJ-J. HU<sup>1</sup>, AND Y-C. LIU<sup>2</sup><sup>1</sup>Institute of Biomedical Engineering, National Cheng Kung University, Tainan, Taiwan, <sup>2</sup>Department of Mechanical Engineering, National Chiao Tung University, Hsinchu, Taiwan, Taiwan**PS-8A-18-231** Measuring Glucose Consumption by Chondrogenically Differentiating Mesenchymal Stem CellsK. J. PENICK<sup>1</sup>, H. BASKARAN<sup>1</sup>, J. A. BERILLA<sup>1</sup>, AND J. F. WELTER<sup>1</sup><sup>1</sup>Case Western Reserve University, Cleveland, OH**PS-8A-18-232** A Bioreactor to Mechanically Stimulate and Evaluate Tissue-engineered Constructs During CultureT. J. LUJAN<sup>1</sup>, K. WIRTZ<sup>1</sup>, S. MADEY<sup>1</sup>, AND M. BOTTLANG<sup>1</sup><sup>1</sup>Legacy Research, Portland, OR**PS-8A-18-233** Influence of Scaffold Structure and Flow Perfusion Shear Stress on MSC Osteoblastic DifferentiationS. B. VANGORDON<sup>1</sup>, R. S. VORONOV<sup>1</sup>, T. B. BLUE<sup>1</sup>, R. L. SHAMBAUGH<sup>1</sup>, D. V. PAPAVALASSILOU<sup>1</sup>, AND V. I. SIKAVITSAS<sup>1</sup><sup>1</sup>University of Oklahoma, Norman, OK**PS-8A-18-234** High-Throughput Antibody-Independent Method For Sorting Stem CellsK. M. LYNCH<sup>1</sup>, AND T. AHSAN<sup>1</sup><sup>1</sup>Tulane University, New Orleans, LA**PS-8A-18-235** CANCELED

## Track: Tissue Engineering – PS-8A-19

## Stem Cells and Tissue Engineering

**PS-8A-19-236** Self-Renewal and Cardiac Specification of Human Pluripotent Stem Cells via Intercellular InteractionsS. M. AZARIN<sup>1</sup>, J. ZHANG<sup>1</sup>, C. HSIAO<sup>1</sup>, X. LIAN<sup>1</sup>, T. J. KAMP<sup>1</sup>, AND S. P. PALECEK<sup>1</sup><sup>1</sup>University of Wisconsin - Madison, Madison, WI**PS-8A-19-237** Long-Term Quantitative In Vivo Characterization of Alginate Microcapsules in Balb/c MiceC. YONG<sup>1</sup>, A. LAWSON<sup>1</sup>, AND A. SAMBANIS<sup>1</sup><sup>1</sup>Georgia Institute of Technology, Atlanta, GA**PS-8A-19-238** Tissue Engineered 3-Dimensional Bone Autografts Using the Wharton's JellyR. I. ABOUSLEIMAN<sup>1,2</sup>, AND V. SIKAVITSAS<sup>2</sup><sup>1</sup>Oklahoma Medical Research Foundation, Oklahoma City, OK, <sup>2</sup>University of Oklahoma, Norman, OK**PS-8A-19-239** Sonic Hedgehog Presentation on Dynabeads Directs Mesodermal Commitment of Mouse Embryonic Stem CellsL. GEUSS<sup>1</sup>, G. ZHANG<sup>2</sup>, AND L. J. SUGGS<sup>1</sup><sup>1</sup>The University of Texas at Austin, Austin, TX, <sup>2</sup>The University of Akron, Akron, OH**PS-8A-19-240** Reprogramming of Gastric Cancer Line MKN-28C. X. CAI<sup>1</sup>, A. Q. LU<sup>1</sup>, AND J.-C. LIAO<sup>1</sup><sup>1</sup>Columbia University, New York, NY**PS-8A-19-241** Dynamic Tracking of Induced Pluripotent Stem Cell Reprogramming ProcessP. J. HAMPILOS<sup>1</sup>, C. X. CAI<sup>1</sup>, AND J.-C. LIAO<sup>1</sup><sup>1</sup>Columbia University, New York, NY**PS-8A-19-242** Unique Technique for Growing Progenitor Epithelial Keratinocyte StrainsA. PERAMO<sup>1</sup>, AND C. MARCELO<sup>1</sup><sup>1</sup>University of Michigan, Ann Arbor, MI**PS-8A-19-243** Mesenchymal Stem Cell (MSC) Response to Growth Factors is Enhanced When They are Delivered from Polysaccharide-based Polyelectrolyte MultilayersJ. L. ALMODOVAR<sup>1</sup>, S. BACON<sup>1</sup>, J. GOGOLSKI<sup>1</sup>, J. KISIDAY<sup>1</sup>, AND M. KIPPER<sup>1</sup><sup>1</sup>Colorado State University, Fort Collins, CO**PS-8A-19-244** Optimization of Intermediate Steps of the Beta-Islet Differentiation Program for Human Embryonic Stem CellsM. JARAMILLO<sup>1</sup>, AND I. BANERJEE<sup>1</sup><sup>1</sup>University of Pittsburgh, Pittsburgh, PA**PS-8A-19-245** Microstructures and Growth Factors Alter Stem Cell Proliferation and Migration for Regenerative TherapyJ. M. COLLINS<sup>1</sup>, P. AYALA<sup>2</sup>, T. A. DESAI<sup>2</sup>, P. H. GOLDSPIK<sup>1</sup>, AND B. RUSSELL<sup>1</sup><sup>1</sup>University of Illinois at Chicago, Chicago, IL, <sup>2</sup>University of California, San Francisco, San Francisco, CA**PS-8A-19-246** Hydrogel Microspheres for Support and Delivery of Neural Stem Cells in a Rodent Model for StrokeC. L. FRANCO<sup>1</sup>, N. GORENKOVA<sup>2</sup>, Z. HASSANI<sup>2</sup>, G. EL AKABAWY<sup>2</sup>, R. POCHÉ<sup>3</sup>, M. MODO<sup>2</sup>, M. DICKINSON<sup>3</sup>, AND J. WEST<sup>1</sup><sup>1</sup>Rice University, Houston, TX, <sup>2</sup>King's College, London, United Kingdom, <sup>3</sup>Baylor College of Medicine, Houston, TX**PS-8A-19-247** Biomaterial Implant Recruits and Differentiates Autologous Stem CellsA. M. NAIR<sup>1,2</sup>, J. SHEN<sup>1,2</sup>, M.-W. SUN<sup>1,2</sup>, C. ZHANG<sup>2</sup>, AND L. TANG<sup>1,2</sup><sup>1</sup>The University of Texas at Arlington, Arlington, TX, <sup>2</sup>The University of Texas-Southwestern Medical Center at Dallas, Dallas, TX**PS-8A-19-248** Differentiation of mESCs into Osteoblasts using Chitosan-Alginate Based Polyelectrolyte ComplexesM. DESAI<sup>1</sup>, N. KULKARNI<sup>1</sup>, D. VERMA<sup>1</sup>, M. L. PREVITERA<sup>1</sup>, R. SCHLOSS<sup>1</sup>, AND N. LANGRANA<sup>1</sup><sup>1</sup>Rutgers University, Piscataway, NJ**PS-8A-19-249** Spontaneous Fusion of Mesenchymal Stem Cells with Endothelial CellsQ. A. TRAN<sup>1</sup>, AND B. OGLE<sup>1</sup><sup>1</sup>University of Wisconsin-Madison, Madison, WI**PS-8A-19-250** Controlled Differentiation of hMSCs into Fibroblast-Like Cells via the Combination of Fibrous Scaffolds and Connective Tissue Growth FactorZ. TONG<sup>1</sup>, S. SANT<sup>2,3</sup>, A. KHADEMHOSEINI<sup>2,3</sup>, AND X. JIA<sup>1</sup><sup>1</sup>Delaware Biotechnology Institute, University of Delaware, Newark, DE, <sup>2</sup>Harvard/MIT Division of Health Sciences and Technology, Massachusetts Institute of Technology, Cambridge, MA, <sup>3</sup>Brigham and Women's Hospital, Harvard Medical School, Cambridge, MA**PS-8A-19-251** Effect of Shear Stress Parameters on Endothelial and Hematopoietic Differentiation in ESCs.R. P. WOLFE<sup>1</sup>, J. LELEUX<sup>1</sup>, AND T. AHSAN<sup>1</sup><sup>1</sup>Tulane University, New Orleans, LA**PS-8A-19-252** Outcomes of Pre-differentiated Mesenchymal Stem Cell-seeded Hydrogel Implants in Cartilage LesionsR. M. SCHULZ<sup>1,2</sup>, J. S. SOMERSON<sup>1,3</sup>, M. ZSCHARNACK<sup>1,2</sup>, P. HEPP<sup>4</sup>, R. RICHTER<sup>4</sup>, C. JOSTEN<sup>4</sup>, A. BADER<sup>2</sup>, AND B. MARQUASS<sup>1,4</sup><sup>1</sup>University of Leipzig Translational Centre for Regenerative Medicine, Leipzig, Germany,<sup>2</sup>University of Leipzig Center of Biotechnology and Biomedicine, Leipzig, Germany,<sup>3</sup>University of Texas Health Science Center San Antonio, San Antonio, TX, <sup>4</sup>University of Leipzig, Department of Trauma and Reconstructive Surgery, Leipzig, Germany**PS-8A-19-253** Propagation of Human Embryonic and Induced Pluripotent Stem Cells on Defined SubstratesR. R. RAO<sup>1</sup><sup>1</sup>Virginia Commonwealth University, Richmond, VA**PS-8A-19-254** An Implantable Immuno-Modulatory Bioreactor for Spinal Cord Injury RepairJ. BARMINKO<sup>1</sup>, J. H. KIM<sup>1</sup>, S. OTSUKA<sup>1</sup>, R. SCHLOSS<sup>1</sup>, M. GRUMET<sup>1</sup>, AND M. L. YARMUSH<sup>1</sup><sup>1</sup>Rutgers University, Piscataway, NJ**PS-8A-19-255** A Small-scale Assay for Optimizing Differentiation Protocols of Human Embryonic Stem CellsJ. T. OUTTEN<sup>1</sup>, X. CHENG<sup>2</sup>, P. GADUE<sup>2</sup>, D. L. FRENCH<sup>2</sup>, AND S. L. DIAMOND<sup>1</sup><sup>1</sup>University of Pennsylvania, Philadelphia, PA, <sup>2</sup>Children's Hospital of Philadelphia, Philadelphia, PA**PS-8A-19-256** Effect of Three Dimensional Culture of Mouse Embryonic Stem Cells on Cytoskeletal Protein ExpressionE. PINEDA FORTIN<sup>1</sup>, AND T. AHSAN<sup>1</sup><sup>1</sup>Tulane University, New Orleans, LA**PS-8A-19-257** Engineering the Pericellular Matrix: Silencing Type VI Collagen and Decorin in Differentiating hMSCsJ. D. TWOMEY<sup>1</sup>, P. I. THAKORE<sup>1</sup>, AND A. H. HSIEH<sup>1,2</sup><sup>1</sup>University of Maryland, College Park, MD, <sup>2</sup>University of Maryland, Baltimore, MD**PS-8A-19-258** Donor-age Dependent Changes in Mesenchymal Stem Cell FunctionsC. BUCKSPAN<sup>1</sup>, AND S. VARGHESE<sup>1</sup><sup>1</sup>Uc San Diego, La Jolla, CA**PS-8A-19-259** Combinatorial Effects of Matrix Elasticity and Cell Shape on Mesenchymal Stem Cell DifferentiationB. J. GILL<sup>1,2</sup>, S. NEMIR<sup>1,2</sup>, AND J. L. WEST<sup>1</sup><sup>1</sup>Rice University, Houston, TX, <sup>2</sup>Baylor College of Medicine, Houston, TX**PS-8A-19-260** Biomaterial Systems to Assess the Influence of Cell-matrix Interactions on Hematopoietic Stem CellsJ. CHOI<sup>1</sup>, AND B. HARLEY<sup>1</sup><sup>1</sup>University of Illinois at Urbana-Champaign, Urbana, ILPS = Poster Session  
OP = Oral Presentation

**PS-8A-19-261** Use of Chemical Gradients to Facilitate the Development of Structurally Oriented CartilageA. L. RIVERA<sup>1</sup>, R. T. LI<sup>2</sup>, J. F. WELTER<sup>1</sup>, AND H. BASKARAN<sup>1</sup><sup>1</sup>Case Western Reserve University, Cleveland, OH, <sup>2</sup>University of Pittsburgh School of Medicine, Pittsburgh, PA**PS-8A-19-262** In Vivo Tracking of Nanoparticle Labeled Mesenchymal Stem Cells Using Photoacoustic ImagingL. M. RICLES<sup>1</sup>, S. NAM<sup>1</sup>, K. SOKOLOV<sup>1,2</sup>, S. EMELIANOV<sup>1</sup>, AND L. J. SUGGS<sup>1</sup><sup>1</sup>University of Texas at Austin, Austin, TX, <sup>2</sup>University of Texas M.D. Anderson Cancer Center, Houston, TX**PS-8A-19-263** Hematopoietic Stem and Progenitor Cells Proliferation Promote the Resolution of Wound InfectionM-H. KIM<sup>1</sup>, J. GRANICK<sup>1</sup>, C. KWOK<sup>1</sup>, D. BORJESSON<sup>1</sup>, F-R. CURRY<sup>1</sup>, L. MILLER<sup>2</sup>, AND S. SIMON<sup>1</sup><sup>1</sup>UC Davis, Davis, CA, <sup>2</sup>UCLA, Los Angeles, CA**PS-8A-19-264** Impact of Extracellular Matrix Composition on Cardiomyogenic Differentiation of hESCsA. LAPERLE<sup>1</sup>, S. PALECEK<sup>1</sup>, AND K. MASTERS<sup>1</sup><sup>1</sup>University of Wisconsin-Madison, Madison, WI**PS-8A-19-265** Connexon-mediated Cell Adhesion Drives Microtissue Self-AssemblyB. A. BAO<sup>1</sup>, AND J. MORGAN<sup>1</sup><sup>1</sup>Brown University, Providence, RI**PS-8A-19-266** Donor Variability in Cord Blood Derived Endothelial Progenitor Cells within 3-D Fibrin Gels Co-cultured with FibroblastsL. TIAN<sup>1</sup><sup>1</sup>University of California, Irvine, Irvine, CA**PS-8A-19-267** Effect of Patterned TNF- Delivery On In Vitro Osteogenic Differentiation of Mesenchymal Stem CellsP. M. MOUNTZIARIS<sup>1</sup>, E. D. LEHMAN<sup>1</sup>, F. K. KASPER<sup>1</sup>, AND A. G. MIKOS<sup>1</sup><sup>1</sup>Rice University, Houston, TX**PS-8A-19-268** Biomaterial Systems to Assess Cell-cell Interactions on Hematopoietic Progenitor CellsB. MAHADIK<sup>1</sup>, J. LIN<sup>1</sup>, G. TIMP<sup>1</sup>, M. SVAGURU<sup>1</sup>, AND B. HARLEY<sup>1</sup><sup>1</sup>University of Illinois at Urbana Champaign, Urbana, IL**PS-8A-19-269** Biomechanical Control of Stem Cell Behavior and FateI. TITUSHKIN<sup>1</sup>, J. SHIN<sup>2</sup>, AND M. CHO<sup>1</sup><sup>1</sup>University of Illinois, Chicago, IL, <sup>2</sup>Korea Advanced Institute of Science and Technology, Daejeon, Korea, Republic of**PS-8A-19-270** Hypoxia-mediated Adipogenesis of Mesenchymal Stem Cells May Be Regulated via the CytoskeletonZ. A. SCHILLER<sup>1</sup>, AND C. K. KUO<sup>1</sup><sup>1</sup>Tufts University, Medford, MA**PS-8A-19-271** Three-Dimensional Differentiation of Human Embryonic Stem Cells into Definitive EndodermW. WANG<sup>1</sup>, Y. ZHU<sup>1</sup>, S. JIN<sup>1</sup>, AND K. YE<sup>1</sup><sup>1</sup>University of Arkansas, Fayetteville, AR**PS-8A-19-272** The Effects of Microenvironment on the Growth and Differentiation of Human Pulpal-derived Stem CellsL. DATKO<sup>1</sup>, M. CUPELLI<sup>1</sup>, S. ALAPATI<sup>2</sup>, AND D. DEAN<sup>1</sup><sup>1</sup>Clemson University, Clemson, SC, <sup>2</sup>University of Illinois at Chicago, Chicago, IL**PS-8A-19-273** Applying Multiple, Independent Chemical Gradients to Human Stem Cells In 3D Culture EnvironmentsS. SANDOCK<sup>1</sup>, J. WHITE<sup>2</sup>, AND T. M. KEENAN<sup>1</sup><sup>1</sup>University of Wisconsin, Madison, WI, <sup>2</sup>University of Michigan, Ann Arbor, MI**PS-8A-19-274** Cell Secreted Matrices Influence the Differentiation of Adipose Derived Stem CellsH. B. COAN<sup>1</sup>, C. BOOTH<sup>1</sup>, M. LIVELY<sup>1</sup>, AND M. VAN DYKE<sup>1</sup><sup>1</sup>Wake Forest School of Medicine, Winston-Salem, NC**PS-8A-19-275** Use of Mesenchymal Stem Cells in the Treatment of Ischemia-reperfusion Injured Skeletal MuscleD. W. HAMMERS<sup>1</sup>, M. CANNON<sup>1</sup>, B. A. BUNNELL<sup>2</sup>, AND R. P. FARRAR<sup>1</sup><sup>1</sup>The University of Texas at Austin, Austin, TX, <sup>2</sup>Tulane University Health Sciences Center, New Orleans, LA**PS-8A-19-276** Mapping the Mechanical Milieu of Stem Cells In Situ within Tissue Engineering ScaffoldsM. SONG<sup>1</sup>, D. DEAN<sup>1</sup>, AND M. L. KNOTHE TATE<sup>1</sup><sup>1</sup>Case Western Reserve University, Cleveland, OH

**Track: Tissue Engineering \* – 8-I-1****Cell-Biomaterial Interfaces**

Chairs: Shelly Peyton, Alisha Sieminski

Room 12A

**10:30AM OP-8-I-1A** Generating Functional T Cells From Stem Cells: Controlling Notch and MHC Signaling in 3D ScaffoldsM. KIM<sup>1</sup>, J. LIN<sup>1</sup>, M. MENDOZA<sup>1</sup>, AND K. ROY<sup>1</sup><sup>1</sup>University of Texas at Austin, Austin, TX**10:45AM OP-8-I-1B** Combinatorial Development of Biomaterials for Stem Cell EngineeringY. MEI<sup>1</sup>, K. SAHA<sup>2</sup>, S. R. BOGATYREV<sup>1</sup>, J. YANG<sup>3</sup>, A. L. HOOK<sup>3</sup>, Z. I. KALCIOGLU<sup>1</sup>, S.-W. CHO<sup>1</sup>, M. MITALIPOVA<sup>2</sup>, N. PYZOCHA<sup>2</sup>, F. ROJAS<sup>1</sup>, K. J. VAN VLIET<sup>1</sup>, M. C. DAVIES<sup>3</sup>, M. R. ALEXANDER<sup>3</sup>, R. LANGER<sup>1</sup>, R. JAENISCH<sup>2</sup>, AND D. ANDERSON<sup>1</sup><sup>1</sup>MIT, Cambridge, MA, <sup>2</sup>Whitehead Institute for Biomedical Research, Cambridge, MA, <sup>3</sup>The University of Nottingham, Nottingham, United Kingdom**11:00AM OP-8-I-1C** Morphological Change of Epithelial Cells Cultured on Substrates with Different StiffnessM. YAMAMOTO<sup>1</sup>, Y. MURAKAMI<sup>1</sup>, AND Y. TABATA<sup>1</sup><sup>1</sup>Institute for Frontier Medical Sciences, Kyoto University, Kyoto, Kyoto, Japan**11:15AM OP-8-I-1D** Quantifying Endothelial Cell-Mediated Deformation of the ECM During Capillary Morphogenesis in 3DE. KNIAZEVA<sup>1</sup>, M. DIGMAN<sup>1</sup>, E. GRATTON<sup>1</sup>, AND A. PUTNAM<sup>2</sup><sup>1</sup>University of California, Irvine, Irvine, CA, <sup>2</sup>University of Michigan, Ann Arbor, MI**11:30AM OP-8-I-1E** Growth Factor Binding is Regulated by Extracellular Matrix Deposition From Human Calvarial OsteoblastsA. BHAT<sup>1</sup><sup>1</sup>University of California-Davis, Woodland, CA**11:45AM OP-8-I-1F** Fibronectin Matrix Conformation Defines Regions of Cell Proliferation and Stress Fiber FormationC. SEVILLA<sup>1</sup>, D. DALECKI<sup>1</sup>, AND D. HOCKING<sup>1</sup><sup>1</sup>University of Rochester, Rochester, NY

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

**Track: Biomedical Imaging and Optics – 8-I-2****Neuroimaging**

Chairs: Simon Cherry, Kris Ropella

Room 12B

**10:30AM OP-8-I-2A** Longitudinal White Matter Changes in Pediatric Traumatic Brain InjuryK. AYOUB<sup>1,2</sup>, E. A. WILDE<sup>2</sup>, Z. CHU<sup>2,3</sup>, T. C. WU<sup>4</sup>, J. V. HUNTER<sup>2,3</sup>, A. C. VASQUEZ<sup>2</sup>, E. D. BIGLER<sup>4</sup>, AND H. S. LEVIN<sup>2</sup><sup>1</sup>Rice University, Houston, TX, <sup>2</sup>Baylor College of Medicine, Houston, TX, <sup>3</sup>Texas Children's Hospital, Houston, TX, <sup>4</sup>Brigham Young University, Provo, UT**10:45AM OP-8-I-2B** Microvascular Functional Imaging with FENSI: Flow-Enhanced Signal IntensityC. OUYANG<sup>1</sup>, AND B. SUTTON<sup>1</sup><sup>1</sup>University of Illinois at Urbana-Champaign, Urbana, IL**11:00AM OP-8-I-2C** New Encoding Schemes for ASL 3D GRASE to Improve Slice Coverage and Reduce Through Plane BlurringH. TAN<sup>1</sup>, W. S. HOGE<sup>2</sup>, AND R. A. KRAFT<sup>1</sup><sup>1</sup>Virginia Tech - Wake Forest School of Biomedical Engineering and Sciences, Winston-Salem, NC, <sup>2</sup>Brigham and Women's Hospital and Harvard Medical School, Boston, MA**11:15AM OP-8-I-2D** High Spatial Resolution Neurovascular Models for the Analysis of Optical Spectroscopy DataN. R. CORNELIUS<sup>1</sup>, AND P. C. DOERSCHUK<sup>1</sup><sup>1</sup>Cornell University, Ithaca, NY**11:30AM OP-8-I-2E** A Random Visual Cortex Mapping Technique for Clinical UseY. MA<sup>1</sup>, E. DEYOE<sup>2</sup>, AND K. ROPELLA<sup>1</sup><sup>1</sup>Marquette University, Milwaukee, WI, <sup>2</sup>Medical College of Wisconsin, Milwaukee, WI**11:45AM OP-8-I-2F** Quantification of Posture-dependent CSF Distribution Via Analysis of CT, MRI, and Upright MRIF. S. GAYZIK<sup>1,2</sup>, D. P. MORENO<sup>1,2</sup>, C. P. GEER<sup>1</sup>, AND J. D. STITZEL<sup>1,2</sup><sup>1</sup>Wake Forest University School of Medicine, Winston-Salem, NC, <sup>2</sup>Virginia Tech - Wake Forest Center for Injury Biomechanics, Winston-Salem, NC**Track: Biomedical Imaging and Optics – 8-I-3****Imaging in Therapeutics – I**

Chairs: Richard Price, Michael Tartis

Room 19A

**10:30AM OP-8-I-3A** Photoacoustic Image-Guided Drug DeliveryK. A. HOMAN<sup>1</sup>, J. CHEN<sup>1</sup>, L. BRANNON-PEPPAS<sup>2</sup>, AND S. EMELIANOV<sup>1</sup><sup>1</sup>University of Texas at Austin, Austin, TX, <sup>2</sup>PeppChem Consulting, Austin, TX**10:45AM OP-8-I-3B** Redefining In-Sight: Effective MRI Contrast Agents in Biodegradable Polymeric Drug Delivery VehiclesR. RAGHEB<sup>1</sup>, H. CHAHBOUNE<sup>1</sup>, J. CRISCIONE<sup>1</sup>, AND T. FAHMY<sup>1</sup><sup>1</sup>Yale University, New Haven, CT**11:00AM OP-8-I-3C** A Platform for Enhanced Contrast Ultrasound Targeted Delivery of TherapeuticsC. W. BURKE<sup>1</sup>, A. L. KILBANOVI<sup>1</sup>, J. SHEEHAN<sup>1</sup>, AND R. J. PRICE<sup>1</sup><sup>1</sup>University of Virginia, Charlottesville, VA**11:15AM OP-8-I-3D** MR-based Pharmacokinetics of the Focused-Ultrasound-induced Blood-Brain Barrier OpeningF. VLACHOS<sup>1</sup>, Y.-S. TUNG<sup>2</sup>, AND E. KONOFAGOU<sup>2</sup><sup>1</sup>Columbia University, New York, NY, <sup>2</sup>Columbia University, New York, NY**11:30AM OP-8-I-3E** Electromagnetically Tracked Ultrasound for Combined CT+US Therapy in Small AnimalsC. F. CASKEY<sup>1</sup>, M. HLAWITSCHKA<sup>1</sup>, S. QIN<sup>1</sup>, AND K. W. FERRARA<sup>1</sup><sup>1</sup>University of California at Davis, Davis, CA**11:45AM OP-8-I-3F** Real-Time Model Assisted MR Temperature Imaging for Monitoring LITT ProceduresD. FUENTES<sup>1</sup>, J. YUNG<sup>1</sup>, A. ELLIOTT<sup>1</sup>, J. HAZLE<sup>1</sup>, AND R. J. STAFFORD<sup>1</sup><sup>1</sup>The University of Texas MD Anderson Cancer Center, Houston, TX**Track: Neural Engineering - 8-I-4****Neural Modeling**

Chairs: Christopher Butson, John White

Room 19B

**10:30AM OP-8-I-4A** Rapid, Anatomic Computational Modeling for Design of Clinical Peripheral Nerve ElectrodesD. J. TYLER<sup>1</sup><sup>1</sup>Case Western Reserve University, Cleveland, OH**10:45AM OP-8-I-4B** A Dual Resonance Model of Cochlear TuningD. C. MOUNTAIN<sup>1</sup><sup>1</sup>Boston University, Boston, MAPS = Poster Session  
OP = Oral Presentation

**11:00AM OP-8-I-4C** State Dependence of Cortical Optogenetic Perturbations during Active Touch

J. T. RITT<sup>1</sup>, J. H. SIEGLE<sup>2</sup>, M. CARLEN<sup>3</sup>, K. MELETIS<sup>3</sup>, L-H. TSAI<sup>2</sup>, AND C. I. MOORE<sup>2</sup>  
<sup>1</sup>Boston University, Boston, MA, <sup>2</sup>Massachusetts Institute of Technology, Boston, MA, <sup>3</sup>Karolinska Institutet, Stockholm, Sweden

**11:30AM OP-8-I-4D** Computational & Evidence Based Methods in Neuromodulation

C. R. BUTSON<sup>1,2</sup>, B. H. KOPELL<sup>1</sup>, S. BAILLET<sup>1</sup>, W. GAGGL<sup>1</sup>, R. R. RAMIREZ<sup>1</sup>, K. DRIESSLEIN<sup>1</sup>, AND S. JAIN<sup>1</sup>  
<sup>1</sup>Medical College of Wisconsin, Milwaukee, WI, <sup>2</sup>Marquette University, Milwaukee, WI

## Track: Cellular and Molecular Engineering – 8-I-5

### Cellular Engineering and Modeling

**Chairs:** Alexander Spector, Fan Yang  
**Room 18A**

**10:30AM OP-8-I-5A** Self-Organization of a Two Cell Muscle Tissue: Theory and Experiment

A. GROSBERG<sup>1,2</sup>, M. L. MCCAIN<sup>1,2</sup>, AND K. K. PARKER<sup>1,2</sup>  
<sup>1</sup>Disease Biophysics Group, School of Engineering and Applied Sciences, Harvard University, Cambridge, MA, <sup>2</sup>Wyss Institute for Biologically Inspired Engineering, Harvard University, Boston, MA

**10:45AM OP-8-I-5B** Modulation of Ca<sup>2+</sup> Homeostasis and Proteostasis for Lysosomal Storage Disease Therapeutics

F. WANG<sup>1</sup>, AND L. SEGATORI<sup>1</sup>  
<sup>1</sup>Rice University, Houston, TX

**11:00AM OP-8-I-5C** Frequency Response Detection and Prediction of First-order Spatiotemporal Dynamics in a Xenopus Embryonic Tissue Using Microfluidics

Y. KIM<sup>1</sup>, S. D. JOSHI<sup>2</sup>, L. A. DAVIDSON<sup>2</sup>, W. C. MESSNER<sup>1</sup>, AND P. R. LEDUC<sup>1</sup>  
<sup>1</sup>Carnegie Mellon University, Pittsburgh, PA, <sup>2</sup>University of Pittsburgh, Pittsburgh, PA

**11:15AM OP-8-I-5D** Decision Tree Analysis of Microfluidic Angiogenesis Studies: Determining Cell Fate Transition Probabilities to VEGF/Ang1 Levels

A. DAS<sup>1</sup>, H. ASADA<sup>1</sup>, D. LAUFFENBURGER<sup>1</sup>, AND R. KAMM<sup>1</sup>  
<sup>1</sup>MIT, Cambridge, MA

**11:30AM OP-8-I-5E** Modeling Biological Membranes as Self-assembled Two-Dimensional Particle Fluids

S. ZHANG<sup>1</sup>, H. YUAN<sup>1</sup>, C. HUANG<sup>1</sup>, AND J. LI<sup>2</sup>  
<sup>1</sup>Penn State University, University Park, PA, <sup>2</sup>Univ. Pennsylvania, Philadelphia, PA

**11:45AM OP-8-I-5F** The Effects of Nuclear Pre-stress on Passive and Facilitated Nuclear Transport

T. CHANCELLOR<sup>1</sup>, AND T. LELE<sup>1</sup>  
<sup>1</sup>University of Florida, Gainesville, FL

## Track: Cellular and Molecular Engineering – 8-I-6

### Cell-Cell Interactions

**Chairs:** Lance Kam, Todd Sulchek  
**Room 18B**

**10:30AM OP-8-I-6A** JNK-mediated Regulation of Adherens Junctions

M. LEE<sup>1</sup>, AND S. ANDREADIS<sup>1</sup>

<sup>1</sup>SUNY Buffalo, Buffalo, NY

**10:45AM OP-8-I-6B** Mechanotransduction at Cell-Cell Junctions

D. LECKBAND<sup>1</sup>, Q. SHI<sup>2</sup>, Q. LE DUC<sup>3</sup>, J. DE ROOIJ<sup>3</sup>, AND N. WANG<sup>2</sup>  
<sup>1</sup>University of Illinois, Champaign, IL, <sup>2</sup>University of Illinois, Urbana, IL, <sup>3</sup>Hubrecht Institute, Utrecht, Utrecht, Netherlands

**11:00AM OP-8-I-6C** Measurement of Adhesion Strengthening in Homophilic Cadherin-Based Cell-Cell Interactions

C. C. ESIMAI<sup>1</sup>, R. OAS<sup>2</sup>, A. P. KOWALCZYK<sup>2</sup>, AND A. J. GARCIA<sup>1</sup>  
<sup>1</sup>Georgia Institute of Technology, Atlanta, GA, <sup>2</sup>Emory University, Atlanta, GA

**11:15AM OP-8-I-6D** Multicellular Aggregation Dynamics is Consistent With a Two-step Transport-reaction Model

M. D. POPE<sup>1</sup>, AND A. R. ASTHAGIRI<sup>1</sup>  
<sup>1</sup>Caltech, Pasadena, CA

**11:30AM OP-8-I-6E** Probing the Microrheology of Mesenchymal Stem Cell Migration to Tumors

M. DAWSON<sup>1</sup>, D. MCGRAIL<sup>1</sup>, AND D. ZUELKE<sup>1</sup>  
<sup>1</sup>Georgia Institute of Technology, Atlanta, GA

**11:45AM OP-8-I-6F** Substratum Compliance Modulates the Quantitative Interplay Between EGF and Cell-Cell Contact and Affects Contact-inhibition of Proliferation in Epithelial Cell Clusters

J. KIM<sup>1</sup>, AND A. ASTHAGIRI<sup>2</sup> JOHN TARBELL  
<sup>1</sup>California Institute of Technology, Engineering and Applied Science, Pasadena, CA, <sup>2</sup>California Institute of Technology, Division of Chemistry and Chemical Engineering, Pasadena, CA

## Track: Cardiovascular Engineering – 8-I-7

### Vascular Permeability

**Chairs:** Kenneth Barbee, John Tarbell  
**Room 18C**

**10:30AM OP-8-I-7A** Endothelial Cell Apoptosis Controls Permeability to Low Density Lipoprotein in Arterial Disease

L. M. CANCEL<sup>1</sup>, F. PIRAINO<sup>2</sup>, AND J. M. TARBELL<sup>1</sup>  
<sup>1</sup>The City College of New York, New York, NY, <sup>2</sup>Politecnico di Milano, Milano, Milano, Italy

**10:45AM OP-8-I-7B** Transendothelial Transport May Determine Adiponectin Oligomer Functions

J. M. RUTKOWSKI<sup>1</sup>, AND P. E. SCHERER<sup>1</sup>  
<sup>1</sup>UT Southwestern Medical Center, Dallas, TX

**11:00AM OP-8-I-7C** Bioengineered Tools for Quantifying Lymphatic Function in Lipid Transport

J. DIXON<sup>1</sup>, J. A. KORNUA<sup>1</sup>, AND T. KASSIS<sup>1</sup>  
<sup>1</sup>Georgia Institute of Technology, Atlanta, GA

**11:15AM OP-8-I-7D** Assessing the Permeability of Engineered Capillary Networks in a 3D Culture

S. J. GRAINGER<sup>1</sup>, AND A. J. PUTNAM<sup>1</sup>  
<sup>1</sup>University of Michigan, Ann Arbor, MI

**11:30AM OP-8-I-7E** Arginine Vasopressin Increases Aquaporin-1 Expression and Hydraulic Conductivity in Bovine Aortic Endothelium Monolayers

C. B. RAVAL<sup>1</sup>, J. M. TARBELL<sup>2</sup>, K-M. JAN<sup>3</sup>, AND D. S. RUMSCHITZKI<sup>2</sup>  
<sup>1</sup>Graduate Center at The City University New York, New York, NY, <sup>2</sup>The City College of New York, NY, NY, <sup>3</sup>Columbia University, New York, NY

**11:45AM OP-8-I-7F** Cholesterol Enrichment Inhibits Endothelial Capacitative Calcium Entry (CCE)

A. M. ANDREWS<sup>1</sup>, AND K. A. BARBEE<sup>1</sup>  
<sup>1</sup>Drexel University, Philadelphia, PA

## Track: Cardiovascular Engineering – 8-I-8

### Heart Valve I: Mechanobiology and Pathology

**Chairs:** Richard Goodwin, James Warnock  
**Room 18D**

**10:30AM OP-8-I-8A** Raman Spectroscopy Characterization to Compare In Vitro and In Situ Aortic Valve Calcification

K. L. CLOYD<sup>1</sup>, I. EL-HAMAMSY<sup>1</sup>, P. SARATHCHANDRA<sup>1</sup>, E. GENTLEMAN<sup>1</sup>, M. H. YACCOUB<sup>1</sup>, A. H. CHESTER<sup>1</sup>, AND M. M. STEVENS<sup>1</sup>  
<sup>1</sup>Imperial College London, London, UK, United Kingdom

**10:45AM OP-8-1-8B** Interaction of Serotonin and TGF $\beta$  Signaling in Embryonic Atrioventricular Valve RemodelingP. BUSKOHL<sup>1</sup>, M. SUN<sup>1</sup>, AND J. T. BUTCHER<sup>1</sup><sup>1</sup>Cornell University, Ithaca, NY**11:00AM OP-8-1-8C** Elevated Pressure Modulates Osteogenic De-Differentiation of Aortic Valve Interstitial CellsC. A. PREGONERO-GAMEZ<sup>1</sup>, A. E. RUHL<sup>1</sup>, AND J. N. WARNOCK<sup>1</sup><sup>1</sup>Mississippi State University, Mississippi State, MS**11:15AM OP-8-1-8D** Fluid Flow Regulates ECM Protein Expression and Deposition During Cardiac Valve DevelopmentH. TAN<sup>1</sup>, S. BIECHLER<sup>1</sup>, L. JUNOR<sup>1</sup>, M. J. YOST<sup>1</sup>, J. D. POTTS<sup>1</sup>, AND R. L. GOODWIN<sup>1</sup><sup>1</sup>University of South Carolina, School of Medicine, Columbia, SC**11:30AM OP-8-1-8E** The Effects of Cyclic Stretch and Serotonin on Aortic Valve RemodelingS. HUSSAIN<sup>1</sup>, C. H. YAP<sup>1</sup>, K. BALACHANDRAN<sup>2</sup>, AND A. YOGANATHAN<sup>1</sup><sup>1</sup>Georgia Institute of Technology, Atlanta, GA, <sup>2</sup>Harvard University, Cambridge, MA**11:45AM OP-8-1-8F** Calcium Accumulation in Strained Aortic Valve Interstitial CellsJ. D. HUTCHESON<sup>1</sup>, AND W. D. MERRYMAN<sup>1</sup><sup>1</sup>Vanderbilt University, Nashville, TN**Track: Respiratory Engineering – 8-1-9****Microfluidics and Tissue Engineering Constructs for the Lung****Chairs:** Samir Ghadiali, Hossein Tavana

Room 17A

**10:30AM OP-8-1-9A** A Human Breathing Lung-on-a-ChipD. HUH<sup>1,2</sup>, B. D. MATTHEWS<sup>2</sup>, A. MAMMOTO<sup>2</sup>, M. MONTOYA-ZAVALA<sup>1,2</sup>, H. HSIN<sup>2</sup>, AND D. E. INGBER<sup>1,2</sup><sup>1</sup>Wyss Institute for Biologically Inspired Engineering at Harvard University, Boston, MA, <sup>2</sup>Harvard Medical School and Children's Hospital Boston, Boston, MA**10:45AM OP-8-1-9B** Challenging Clearance: A Mucus Clearance Assay to Study the Effect of External Forces on ClearanceJ. CARPENTER<sup>1</sup>, M. MILLARD<sup>1</sup>, V. PARIKH<sup>1</sup>, E. T. O'BRIEN<sup>1</sup>, M. R. FALVO<sup>1</sup>, AND R. R. SUPERFINE<sup>1</sup><sup>1</sup>UNC Chapel Hill, Chapel Hill, NC**11:00AM OP-8-1-9C** The Role of Fluid Mechanical Stresses in the Development of Ventilator-Induced Lung InjuryN. J. DOUVILLE<sup>1</sup>, Y-C. TUNG<sup>1</sup>, P. ZAMANKHAN<sup>1</sup>, J. B. GROTEBERG<sup>1</sup>, AND S. TAKAYAMA<sup>1</sup><sup>1</sup>University of Michigan, Ann Arbor, MI**11:15AM OP-8-1-9D** Shadowgraphic and -PIV Measurements of Bubble Shape and Flow Fields During Pulsatile PropagationB. J. SMITH<sup>1</sup>, E. YAMAGUCHI<sup>1</sup>, J. W. THIEMAN<sup>1</sup>, AND D. P. GAVER III<sup>1</sup><sup>1</sup>Tulane University, New Orleans, LA**11:30AM OP-8-1-9E** A Biomimetic System to Investigate the Effect of Wall Compliance on Microbubble-induced Cell InjuryN. HIGUITA-CASTRO<sup>1</sup>, X. CHEN<sup>1</sup>, C. MIHAI<sup>1</sup>, D. J. HANSFORD<sup>1</sup>, AND S. N. GHADIALI<sup>1</sup><sup>1</sup>The Ohio State University, Columbus, OH**11:45AM OP-8-1-9F** Predicting Cellular Strains Throughout the Airway Tree with a Computational Model of Airway MechanicsA. S. LAPRAD<sup>1</sup>, B. SUKI<sup>1</sup>, AND K. R. LUTCHEN<sup>1</sup><sup>1</sup>Boston University, Boston, MA**Track: Systems Biology, Bioinformatics and Computational Biology - 8-1-10****Multiscale Modeling****Chairs:** Andre Levchenko, Jeffrey Saucerman

Room 17B

**10:30AM OP-8-1-10A** Multiscale Modeling of the ErbB Tyrosine Kinase Signaling Networks Through Theory and ExperimentS. E. TELESKO<sup>1</sup>, R. VADIGEPALLI<sup>2</sup>, AND R. RADHAKRISHNAN<sup>1</sup><sup>1</sup>University of Pennsylvania, Philadelphia, PA, <sup>2</sup>Thomas Jefferson University, Philadelphia, PA**10:45AM OP-8-1-10B** Probabilistic Integrative Modeling of Genome-scale Metabolic and Regulatory NetworksS. CHANDRASEKARAN<sup>1</sup>, AND N. D. PRICE<sup>1</sup><sup>1</sup>Institute for Genomic Biology, University of Illinois, Urbana-Champaign, Urbana, IL**11:00AM OP-8-1-10C** A New Computational and Conceptual Framework for Linking Multi-cell to Tissue-Level ModelingB. C. THORNE<sup>1</sup>, H. HAYENGA<sup>2</sup>, J. HUMPHREY<sup>2</sup>, AND S. M. PEIRCE<sup>1</sup><sup>1</sup>University of Virginia, Charlottesville, VA, <sup>2</sup>Texas A&M University, College Station, TX**11:15AM OP-8-1-10D** Tumor Targeting Across the Size Spectrum – Common Physiology, Divergent PharmacokineticsG. M. THURBER<sup>1</sup>, AND R. WEISSELEDER<sup>1</sup><sup>1</sup>Harvard Medical School/Mass General Hospital, Boston, MA**11:30AM OP-8-1-10E** Elastic Network & Finite Element Model vs. SMD to Simulate Structural Protein MechanicsS. KREUZER<sup>1</sup>, E. KHATIBLOU<sup>1</sup>, D. LIU<sup>1</sup>, J. ZHOU<sup>1</sup>, J. MARQUEZ<sup>1</sup>, AND T. MOON<sup>1,2</sup><sup>1</sup>University of Texas at Austin, Austin, TX, <sup>2</sup>Texas Materials Institute, Austin, TX**11:45AM OP-8-1-10F** Computational Models of Embryonic Wound HealingM. A. WYCZALKOWSKI<sup>1</sup>, AND L. A. TABER<sup>1</sup><sup>1</sup>Washington University in St. Louis, St. Louis, MO**Track: Devices: Nano to Micro - 8-1-11****Medical Diagnostics: Nano to Micro Devices – III****Chairs:** Phil LeDuc, John McDevitt

Room 16A

**10:30AM OP-8-1-11A** Improvement in Low Concentration Assays Using VCATs Coupled with SPRIY. OKABE<sup>1</sup>, Y. CHEN<sup>1</sup>, R. CORN<sup>1</sup>, AND A. LEE<sup>1</sup><sup>1</sup>University of California, Irvine, Irvine, CA**10:45AM OP-8-1-11B** Identification of Cancer Staging in Human Patients Using Nanoporous Silica Chips for Protein ProfilingE. TASCIOTTI<sup>1</sup>, M. AGOSTINI<sup>2</sup>, A. BOUAMRANI<sup>1</sup>, T. HU<sup>3</sup>, D. NITTI<sup>5</sup>, AND M. FERRARI<sup>1</sup><sup>1</sup>University of Texas Health Science Center at Houston, Houston, TX, <sup>2</sup>Universita' di Padova, Padova, Italy, <sup>3</sup>University Of Texas at Austin, Austin, TX, <sup>4</sup>United States Minor Outlying Islands**11:00AM OP-8-1-11C** Aptamer-based Nanoplasmonic VEGF165 Sensor for Breast Cancer DiagnosticsE-C. YEH<sup>1</sup>, H. CHO<sup>1</sup>, R. SINHA<sup>2</sup>, AND L. P. LEE<sup>1</sup><sup>1</sup>University of California, Berkeley, Berkeley, CA, <sup>2</sup>Pennsylvania State University, Hershey, PA**11:15AM OP-8-1-11D** Detection of Cancer Related DNA Nanoparticulate Biomarkers in Whole BloodM. J. HELLER<sup>1</sup>, AND A. SONNENBERG<sup>1</sup><sup>1</sup>University of California San Diego, La Jolla, CAPS = Poster Session  
OP = Oral Presentation



**11:30AM OP-8-I-11E** Molecular Profiling of Tumors from Fine-Needle Aspirate Biopsies using a Miniaturized NMR DeviceJ. B. HAUN<sup>1</sup>, H. LEE<sup>1</sup>, C. M. CASTRO<sup>1</sup>, AND R. WEISSELEDER<sup>1</sup><sup>1</sup>Massachusetts General Hospital, Boston, MA**11:45AM OP-8-I-11F** Integrated Molecular Diagnostic Systems (iMDs) for Sepsis DiagnosticsD. MITRA<sup>1</sup>, S-S. CHEN<sup>1</sup>, AND L. P. LEE<sup>1</sup><sup>1</sup>University of California, Berkeley, Berkeley, CA**Track: Devices: Nano to Micro – 8-I-12****Nano to Micro: Fluidic Technologies – III****Chairs:** Sanjay Kumar, Huikai Xie**Room 16B****10:30AM OP-8-I-12A** Directing Cell Migration by Dynamic Repositioning of Chemotactic Laminar StreamsS. MOORJANI<sup>1</sup>, R. NIELSON<sup>1,2</sup>, X. A. CHANG<sup>1</sup>, AND J. B. SHEAR<sup>1</sup><sup>1</sup>University of Texas, Austin, TX, <sup>2</sup>BD Technologies, Research Triangle Park, NC**10:45AM OP-8-I-12B** Core-Shell Biomimetic Cilia: Driven Flow in Aqueous and Viscoelastic FluidsB. L. FISER<sup>1</sup>, A. R. SHIELDS<sup>1</sup>, D. BOBER<sup>2</sup>, B. A. EVANS<sup>3</sup>, AND R. SUPERFINE<sup>1</sup><sup>1</sup>University of North Carolina at Chapel Hill, Chapel Hill, NC, <sup>2</sup>Swarthmore College, Swarthmore, PA, <sup>3</sup>Elon University, Elon, NC**11:00AM OP-8-I-12C** - A Parallelized Microfluidic Chamber Device for High-Throughput Nerve Regeneration Studies in *C. elegans*N. GHORASHIAN<sup>1</sup>, M. A. HILLIARD<sup>2</sup>, AND A. BEN-YAKAR<sup>1</sup><sup>1</sup>The University of Texas at Austin, Austin, TX, <sup>2</sup>The University of Queensland, Brisbane, Queensland, Australia**11:15AM OP-8-I-12D** Open-Chamber Focal Stimulation Device for Biomimetic Study of SynaptogenesisT. CHANG<sup>1</sup>, N. BHATTACHARJEE<sup>1</sup>, AND A. FOLCH<sup>1</sup><sup>1</sup>University of Washington, Seattle, WA**11:30AM OP-8-I-12E** Autonomous Microfluidic Device for Quantification and Regulation of VasopressinA. J. CHUNG<sup>1</sup>, I. CHOI<sup>1</sup>, B. CORDOVEZ<sup>1</sup>, Y. HUH<sup>1,2</sup>, AND D. ERICKSON<sup>1</sup><sup>1</sup>Cornell University, Ithaca, NY, <sup>2</sup>Korea Basic Science Institute, Daejeon, Chung-nam, Korea, Republic of**11:45AM OP-8-I-12F** Characterization of Self-Assembled Micro/Nanochannel Fabrication in PDMSW. T. KAHSAI<sup>1</sup>, U. H. PHAM<sup>1</sup>, R. SHAFABAKHSH<sup>1</sup>, J. S. SANKARAN<sup>1</sup>, AND S. M. IQBAL<sup>1</sup><sup>1</sup>University of Texas Arlington, Arlington, TX**Track: Drug Delivery Systems \* – 8-I-13****Novel Materials & Self-Assembling Systems****Chairs:** Jason Burdick, Horst von Recum**Room 14****10:30AM OP-8-I-13A** Enzymatically-Degradable Microgels for Physiologically-Triggered Release of Therapeutic AgentsP. WANAKULE<sup>1</sup>, A. BERGERON<sup>1</sup>, AND K. ROY<sup>1</sup><sup>1</sup>University of Texas at Austin, Austin, TX**10:45AM OP-8-I-13B** Development of Inorganic/Organic Hybrid Based pH Responsive Hydrogels for Drug Delivery ApplicationS. Z. KHALED<sup>1</sup>, S. DIETZ<sup>1</sup>, C. A. SMID<sup>1</sup>, M. FERRARI<sup>1</sup>, AND E. TASCIOTTI<sup>1</sup><sup>1</sup>The University of Texas Health Science Center at Houston, Houston, TX**11:00AM OP-8-I-13C** Sustained Release Nitric Oxide From Long Lived Circulating NanoparticlesP. CABRALES<sup>1</sup><sup>1</sup>University of California, San Diego, La Jolla, CA**11:15AM OP-8-I-13D** Novel Biodegradable PGD Polymeric Nanoparticles Preparation and CharacterizationR. MANCHANDA<sup>1</sup>, Y-C. HUANG<sup>1</sup>, T. LEI<sup>1</sup>, A. FERNANDEZ-FERNANDEZ<sup>1</sup>, AND A. J. MCGORON<sup>1</sup><sup>1</sup>Florida International University, Miami, FL**11:30AM OP-8-I-13E** Controlled Delivery of Programmable Colloidal StructuresM. RAFAT<sup>1</sup>, J-O. YOU<sup>1</sup>, AND D. T. AUGUSTE<sup>1</sup><sup>1</sup>Harvard University, Cambridge, MA**11:45AM OP-8-I-13F** Immunosuppressive Micelles Delivered Locally to Lymph Nodes Prolong Allograft SurvivalK. Y. DANE<sup>1</sup>, C. P. O'NEIL<sup>1</sup>, C. NEMBRINI<sup>1</sup>, A. A. TOMEI<sup>1</sup>, D. VELLUTO<sup>1</sup>, J. K. EBY<sup>1</sup>, M. A. SWARTZ<sup>1</sup>, AND J. A. HUBBELL<sup>1</sup><sup>1</sup>Ecole Polytechnique Fédérale de Lausanne, Lausanne, Vaud, Switzerland**\* Drug Delivery Systems Track is sponsored by Acta Biomaterialia****Track: Drug Delivery Systems – 8-I-14****Translational Drug Delivery****Chairs:** Jordan Green, Jung Suh**Room 15****10:30AM OP-8-I-14A** Drug Release Kinetics of Coronary Stent: An *In Vivo* AnalysisS. K. YAZDANI<sup>1</sup>, F. D. KOLOGDIE<sup>1</sup>, AND R. VIRMANI<sup>1</sup><sup>1</sup>CVPath Institute, Gaithersburg, MD**10:45AM OP-8-I-14B** Evolutionary Game Theoretical Approach for Controlled Drug Delivery of GiardiasisJ. WU<sup>1</sup>, S. LENAGHAN<sup>1</sup>, AND M. ZHANG<sup>2</sup><sup>1</sup>UTK, Knoxville, TN, <sup>2</sup>University of Tennessee, Knoxville, TN**11:00AM OP-8-I-14C** Novel Nanoparticle-encapsulated Compound Halts Gliomalinvasion *In Vivo*J. M. MUNSON<sup>1</sup>, J. ARBISER<sup>2</sup>, AND R. BELLAMKONDA<sup>1</sup><sup>1</sup>Georgia Institute of Technology, Atlanta, GA, <sup>2</sup>Emory Medical School, Atlanta, GA**11:15AM OP-8-I-14D** Hyperthermic Drug Delivery Using Metal NanoparticlesN. H. LEVI-POLYACHENKO<sup>1</sup>, A. BRADEN<sup>1</sup>, AND M. MORYKWAS<sup>1</sup><sup>1</sup>Wake Forest University Health Sciences, Winston-Salem, NC**11:30AM OP-8-I-14E** Enhancement of Drug Uptake to Rat Tibia Tumors Using Non-Invasive Mechanical LoadingP. E. PALACIO MANCHENO<sup>1</sup>, D. SHARMA<sup>1</sup>, J. H. HEALEY<sup>2</sup>, G. R. DIRESTA<sup>3</sup>, AND S. P. FRITTON<sup>1</sup><sup>1</sup>City College of New York, New York, NY, <sup>2</sup>Memorial Sloan-Kettering Cancer Center, New York, NY, <sup>3</sup>Polytechnic Institute of NYU, New York, NY**11:45AM OP-8-I-14F** Nanochannel Platform for the Controlled Delivery of ChemotherapeuticsA. GRATTONI<sup>1</sup>, H. SHEN<sup>1</sup>, D. FINE<sup>1</sup>, A. ZIEMYS<sup>1</sup>, J. GILL<sup>1</sup>, AND M. FERRARI<sup>1,2</sup><sup>1</sup>The University of Texas Health Science Center at Houston, Houston, TX, <sup>2</sup>The University of Texas MD Anderson Cancer Center, Houston, TX

**Track:Tissue Engineering \* – 8-1-15****Engineered Tissue Models of Disease****Chairs:** Claudia Fischbach-Teschl, Yaakov Nahmias**Ballroom F****10:30AM OP-8-1-15A** Normal and Diseased Development of Model TissuesC. M. NELSON<sup>1</sup><sup>1</sup>Princeton University, Princeton, NJ**10:45AM OP-8-1-15B** Adipose Derived Stem Cells and Their Role in Breast Cancer StiffeningB. SEO<sup>1</sup>, E. M. CHANDLER<sup>1</sup>, D. TIMS<sup>1</sup>, M. BUCKLEY<sup>1</sup>, I. COHEN<sup>1</sup>, AND C. FISCHBACH<sup>1</sup><sup>1</sup>Cornell University, Ithaca, NY**11:00AM OP-8-1-15C** Cell-Mediated Differences Between Vascular And Valvular CalcificationZ. FERDOUS<sup>1</sup>, H. JO<sup>2</sup>, AND R. M. NEREM<sup>3</sup><sup>1</sup>Georgia Institute of Technology, Atlanta, GA, <sup>2</sup>Emory University, Atlanta, GA, <sup>3</sup>Georgia Tech/Emory Center (GTEC), Atlanta, GA**11:15AM OP-8-1-15D** Persistent Hepatitis C Virus Infection in Microscale Primary Human Hepatocyte CulturesA. PLOSS<sup>1</sup>, S. KHETANI<sup>2</sup>, C. T. JONES<sup>1</sup>, A. J. SYDER<sup>3</sup>, K. TREHAN<sup>4</sup>, V. A. GAYSINSKAYA<sup>5</sup>, K. MU<sup>1</sup>, K. RITOLA<sup>1</sup>, C. M. RICE<sup>1</sup>, AND S. N. BHATIA<sup>4</sup><sup>1</sup>The Rockefeller University, New York, NY, <sup>2</sup>Hepregen Corporation, Medford, MA, <sup>3</sup>Therx Pharmaceuticals, San Diego, CA, <sup>4</sup>Massachusetts Institute of Technology, Cambridge, MA, <sup>5</sup>Johns Hopkins University, New York, NY**11:30AM OP-8-1-15E** Influence of GAG Identity on SMC Foam Cell FormationA. C. JIMENEZ<sup>1</sup>, D. MUNOZ-PINTO<sup>1</sup>, D. ORTIZ<sup>2</sup>, AND M. HAHN<sup>1</sup><sup>1</sup>Texas A&M University, College Station, TX, <sup>2</sup>Texas A&M University, College Station, TX**11:45AM OP-8-1-15F** Modeling Shock Response of Human Head Using Fluid Structure Interaction (FSI)N. CHANDRA<sup>1</sup>, L. GU<sup>1</sup>, S. G. GANPULE<sup>1</sup>, AND E. PLOUGONVEN<sup>1</sup><sup>1</sup>University of Nebraska Lincoln, Lincoln, NE**\*Tissue Engineering Track sponsored by Kinetic Concepts, Inc.****Track:Tissue Engineering \* – 8-1-16****Neural Tissue Engineering – II****Chairs:** Jessica Winter, Xiaojun Yu**Ballroom G****10:30AM OP-8-1-16A** Pre-treatment of Glia with DC Electrical Stimulation Increases Directional Neurite OutgrowthA. N. ELDRIDGE<sup>1</sup>, A. SEGGIO<sup>1</sup>, A. NORDBERG<sup>1</sup>, G. PAOLILLO<sup>1</sup>, AND D. THOMPSON<sup>1</sup><sup>1</sup>Rensselaer Polytechnic Institute, Troy, NY**10:45AM OP-8-1-16B** Retinal Scaffolds: Synaptic and Stem Cell IntegrationJ. HERTZ<sup>1</sup>, E. LAVIK<sup>2</sup>, AND J. L. GOLDBERG<sup>1</sup><sup>1</sup>University of Miami, Miami, FL, <sup>2</sup>Case Western Reserve, Cleveland, OH**11:00AM OP-8-1-16C** Effects of Environment Dimensionality on DRG Neurons: 3D Better Mimics In Vivo FeaturesA. RIBEIRO<sup>1</sup>, E. POWELL<sup>2</sup>, AND J. LEACH<sup>1</sup><sup>1</sup>UMBC, Chemical & Biochemical Engineering, Baltimore, MD, <sup>2</sup>University of Maryland School of Medicine, Departments of Anatomy & Neurobiology and Psychiatry, Baltimore, MD**11:15AM OP-8-1-16D** Neural, Astroglial and Endothelial Heterotypic Cell-Cell Interactions in 3DY-T. LIU<sup>1</sup>, J. R. MORGAN<sup>1</sup>, AND D. HOFFMAN-KIM<sup>1</sup><sup>1</sup>Brown University, Providence, RI**11:30AM OP-8-1-16E** 3D Culture Models to Study Paracrine Signaling Between Endothelial and Brain Tumor Stem CellsD. W. INFANGER<sup>1</sup>, S. C. LIU<sup>1</sup>, D. GURSEL<sup>2</sup>, J. A. BOOCKVAR<sup>2</sup>, AND C. FISCHBACH<sup>1</sup><sup>1</sup>Cornell University, Ithaca, NY, <sup>2</sup>Weill Cornell Medical College of Cornell University, New York, NY**11:45AM OP-8-1-16F** Astrocytic EphrinB2 Signaling Regulates Neuronal Differentiation of Adult Neural Stem CellsR. S. ASHTON<sup>1</sup>, A. CONWAY<sup>1</sup>, C. PANGARKAR<sup>2</sup>, M. BISSELL<sup>2</sup>, AND D. V. SCHAFFER<sup>1</sup><sup>1</sup>University of California Berkeley, Berkeley, CA, <sup>2</sup>Lawrence Berkeley National Laboratory, Berkeley, CA**\*Tissue Engineering Track sponsored by Kinetic Concepts, Inc.**

**Track: Biomedical Engineering Education – PS-8B-1****Student Projects in Global Health****PS-8B-1-1** A Packet-Based Medicine Distribution System for Preventing Mother to Child Transmission of HIV/AIDSS. FOK<sup>1</sup>, Y. F. FEI<sup>1</sup>, A. LI<sup>1</sup>, A. CHOE<sup>1</sup>, W. KOURY<sup>1</sup>, A. MCLAUGHLIN<sup>1</sup>, AND M. WINEK<sup>1</sup>  
<sup>1</sup>Washington University in St. Louis, St. Louis, MO**PS-8B-1-2** Combined Thermometer/Otoscope Device Providing Dual Functionality With No External Power Source for Developing World HospitalsD. DORFMAN<sup>1</sup>, B. KEELEY<sup>1</sup>, D. SALUME<sup>1</sup>, D. SHIN<sup>1</sup>, N. BOUGRAB<sup>1</sup>, G. BARROS<sup>1</sup>, X. HU<sup>1</sup>, S. BROWN<sup>1</sup>, P. PODDAR<sup>1</sup>, AND S. KIM<sup>1</sup><sup>1</sup>Johns Hopkins University, Baltimore, MD**PS-8B-1-3** Hand-Cranked Hypertension Screening Device to Detect PreeclampsiaM. TRACHTENBERG<sup>1</sup>, G. JAYARAM<sup>1</sup>, S. LEE<sup>1</sup>, S. ACHARYA<sup>1</sup>, N. THAKOR<sup>1</sup>, AND H. SANGHVI<sup>2</sup><sup>1</sup>The Johns Hopkins University, Baltimore, MD, <sup>2</sup>JHPIEGO, Baltimore, MD**PS-8B-1-4** Feasibility of Enhanced Algorithms for Post-Crash Injury Prediction for Improved Field TriageS. M. COMAS<sup>1</sup>, AND H. C. GABLER<sup>1</sup><sup>1</sup>Virginia Tech, Blacksburg, VA**PS-8B-1-5** Design and Development of a Low-Cost SpirometerJ. GLYNN<sup>1</sup>, A. DIAS<sup>1</sup>, J. SCHAEFER<sup>1</sup>, A. BREMER<sup>1</sup>, AND D. VAN SICKLE<sup>1</sup><sup>1</sup>University of Wisconsin - Madison, Madison, WI**PS-8B-1-6** Removing Population Structure in Genome-Wide Association Studies Using Supervised MethodsA. B. DICKS<sup>1</sup>, R. PARRY<sup>1</sup>, AND M. D. WANG<sup>1</sup><sup>1</sup>Georgia Institute of Technology, Atlanta, GA**PS-8B-1-7** Low-Cost EKG Proposed for the State of Chihuahua, MexicoB. A. RODRIGUEZ<sup>1</sup>, S. L. MONTES<sup>1</sup>, AND R. AGUILAR<sup>1</sup><sup>1</sup>ITESM Campus Chihuahua, Chihuahua, Chihuahua, Mexico**PS-8B-1-8** CANCELED**PS-8B-1-9** Designing a Reliable, Reusable, and Inexpensive Respiratory Monitor for Use in Developing HospitalsA. GREIS<sup>1</sup>, M. DANILEVICH<sup>1</sup>, S. MERUGUMALA<sup>1</sup>, K. HATTAWAY<sup>1</sup>, AND K. GLASS<sup>1</sup><sup>1</sup>Engineering World Health University of Texas, Austin, TX**PS-8B-1-10** Mercer on Mission Prosthetic Knee JointL. A. ELLIOTT<sup>1</sup>, C. BUTLER<sup>1</sup>, AND S. V. LADSON<sup>1</sup><sup>1</sup>Mercer University, Macon, GA**PS-8B-1-11** Reusable Digital Manometer for Diagnosis of Cryptococcal Meningitis in Resource-Poor SettingsM. S. FIFER<sup>1</sup>, A. W. CHENG<sup>1</sup>, S. C. STENDER<sup>2</sup>, N. V. THAKOR<sup>1</sup>, H. C. SANGHVI<sup>2</sup>, AND S. ACHARYA<sup>1</sup><sup>1</sup>Johns Hopkins University, Baltimore, MD, <sup>2</sup>Jhpiego, Baltimore, MD**PS-8B-1-12** Engineering Outside of the Classroom: Lessons From Engineers Without Borders at University of WashingtonJ. A. CALLIHAN<sup>1</sup><sup>1</sup>University of Washington, Seattle, WA**Track: Biomedical Imaging and Optics – PS-8B-2****Imaging in the Enhancement or Assessment of Therapeutic Delivery****PS-8B-2-13** A Study on Porous Scaffold Design for Perfusion Control in a Dynamic Imaging PhantomA. THOMAS<sup>1</sup>, J. BALTER<sup>1</sup>, AND S. J. HOLLISTER<sup>1</sup><sup>1</sup>University of Michigan, Ann Arbor, MI**PS-8B-2-14** Monte Carlo Simulations and Experimental Measurements for Chronic Wound Assessment with Diffuse NIRX. MAO<sup>1</sup>, AND E. S. PAPAZOGLU<sup>1</sup><sup>1</sup>Drexel University, Philadelphia, PA**PS-8B-2-15** Synthetic Ferritin Nanocores as a MRI Contrast AgentB. SANA<sup>1</sup>, AND S. LIM<sup>1</sup><sup>1</sup>Nanyang Technological University, Nanyang, Singapore**PS-8B-2-16** A Contrast Enhancement Filter for improving Stent Visibility in Interventional X-Ray FluoroscopyY. JIANG<sup>1</sup>, AND L-H. CHANG<sup>1</sup><sup>1</sup>University of Central Oklahoma, Edmond, OK**PS-8B-2-17** A Novel Algorithm for 3D Model Reconstruction from Bi-Planar Angiogram ImagesW. A. STOY<sup>1</sup><sup>1</sup>North Carolina State University, Raleigh, NC**PS-8B-2-18** Three-dimensional Quantification and Visualization Model for Drug Delivery in EyesY-T. TSAI<sup>1</sup>, W. HU<sup>2</sup>, AND L. TANG<sup>1</sup><sup>1</sup>University of Texas at Arlington, Arlington, TX, <sup>2</sup>Progenitec Inc., Arlington, TX**PS-8B-2-19** Microfluidic Approaches for Synthesis of Microbubble-based MaterialsJ. WAN<sup>1</sup>, AND H. STONE<sup>1</sup><sup>1</sup>Princeton University, Princeton, NJ**PS-8B-2-20** Combined Mechanical and Optical Simulation of Tissue During Application of Optical Clearing DevicesW. C. VOGT<sup>1</sup>, A. IZQUIERDO-ROMAN<sup>1</sup>, A. A. GURJARPADHYE<sup>1</sup>, AND C. G. RYLANDER<sup>1</sup><sup>1</sup>Virginia Polytechnic Institute and State University, Blacksburg, VA**PS-8B-2-21** Advanced Microscopic Analysis of the Attachment Mechanism of *Giardia lamblia*S. LENAGHAN<sup>1</sup>, K. WHITE<sup>1</sup>, Z. ZHANG<sup>1</sup>, AND M. ZHANG<sup>1</sup><sup>1</sup>University of Tennessee, Knoxville, TN**PS-8B-2-22** Towards *In Vivo* Toxicity of Gadolinium-Single Walled Carbon Nanotubes as MRI Contrast ProbesP. K. AVTI<sup>1</sup>, K. R. SHROYER<sup>1</sup>, AND B. SITHARAMAN<sup>1</sup><sup>1</sup>Stony Brook University, Stony Brook, NY**PS-8B-2-23** Laser-induced Lipolysis Using Fiberoptic MicroneedlesM. A. KOSOGLU<sup>1</sup>, C. YE<sup>1</sup>, R. L. HOOD<sup>1</sup>, AND C. G. RYLANDER<sup>1</sup><sup>1</sup>Virginia Tech, Blacksburg, VA**PS-8B-2-24** Model Assisted MR Thermometry for Laser Induced Thermal TherapyJ. P. YUNG<sup>1,2</sup>, D. FUENTES<sup>1</sup>, A. M. ELLIOTT<sup>1</sup>, R. J. STAFFORD<sup>1</sup>, AND J. D. HAZLE<sup>1</sup><sup>1</sup>The University of Texas M.D. Anderson Cancer Center, Houston, TX, <sup>2</sup>The University of Texas Graduate School of Biomedical Sciences at Houston, Houston, TX**PS-8B-2-25** Multifunctional Magnetic Nanostructures for Imaging and Drug Delivery ApplicationsS. FOY<sup>1,2</sup>, R. L. MANTHE<sup>1</sup>, T. K. JAIN<sup>1</sup>, S. K. DIMITRIJEVIC<sup>1</sup>, AND V. LABHASEWAR<sup>1,3</sup><sup>1</sup>Cleveland Clinic, Cleveland, OH, <sup>2</sup>Cleveland Clinic Lerner College of Medicine of Case Western Reserve University, Cleveland, OH, <sup>3</sup>Tausig Cancer Institute, Cleveland, OH

**PS-8B-2-26** Computational Model for Predicting Drug Distribution in the Human Brain Using DTIY. RAWASH<sup>1</sup>, O. IVANCHENKO<sup>1</sup>, N. SINDHWANI<sup>1</sup>, AND A. LINNINGER<sup>1</sup>  
<sup>1</sup>University of Illinois at Chicago, Chicago, IL**PS-8B-2-27** Acoustically Sensitive Microcapsules for Ultrasound-based Localized Drug DeliveryN. PHIPPS<sup>1</sup>, M. MOBED-MIREMADI<sup>1</sup>, AND M. KERALAPURA<sup>1</sup>  
<sup>1</sup>San Jose State University, San Jose, CA**Track: Biomedical Imaging and Optics – PS-8B-3****Neuroimaging****PS-8B-3-28** Non-invasively Reconstructing Cortical Sources of Interictal Spikes using Scalp MEG Data from Epilepsy PatientsM. ZHU<sup>1</sup>, L. DING<sup>1</sup>, W. B. ZHANG<sup>2</sup>, D. L. DICKENS<sup>2</sup>, AND J. A. KING<sup>3</sup>  
<sup>1</sup>University of Oklahoma, Norman, OK, <sup>2</sup>Minnesota Epilepsy Group, St. Paul, MN, <sup>3</sup>University of Oklahoma Health Science Center, Oklahoma City, OK**PS-8B-3-29** Exploring the Feasibility of the Detection of Neuronal Activity Evoked By Dendrite Currents Using MRIR. S. WIJESINGHE<sup>1</sup>, B. D. DOLASINSKI<sup>1</sup>, AND B. J. ROTH<sup>2</sup>  
<sup>1</sup>Ball State University, Muncie, IN, <sup>2</sup>Oakland University, Rochester, MI**PS-8B-3-30** Using ICA to investigate Impaired Motor Preparation in Parkinson's Patients During A Delayed Cued Finger Movement TaskS. PATEL<sup>1</sup>, AND J. LEE<sup>1</sup>  
<sup>1</sup>University of Cincinnati, Cincinnati, OH**PS-8B-3-31** Monte Carlo Modeling of *In Vivo* Phosphorescence -lifetime-based pO<sub>2</sub> MeasurementsM. A. DAVIS<sup>1</sup>, A. PONTICORVO<sup>1</sup>, AND A. K. DUNN<sup>1</sup>  
<sup>1</sup>The University of Texas at Austin, Austin, TX**PS-8B-3-32** Intraoperative Laser Speckle Contrast Imaging for Monitoring Cerebral Blood FlowL. M. RICHARDS<sup>1</sup>, A. B. PARTHASARATHY<sup>1</sup>, E. L. WEBER<sup>1</sup>, M. G. BURNETT<sup>2</sup>, D. J. FOX<sup>2</sup>, AND A. K. DUNN<sup>1</sup>  
<sup>1</sup>University of Texas at Austin, Austin, TX, <sup>2</sup>St. David's Hospitals, Austin, TX**PS-8B-3-33** Comparison of Indocyanine Green Fluorescence and Laser Speckle Contrast ImagingE. L. WEBER<sup>1</sup>, L. M. RICHARDS<sup>1</sup>, A. B. PARTHASARATHY<sup>1</sup>, S. M. KAZMI<sup>1</sup>, AND A. K. DUNN<sup>1</sup>  
<sup>1</sup>University of Texas at Austin, Austin, TX**PS-8B-3-34** Imaging Schwann Cell High Affinity Nerve Growth Factor Receptors Using Atomic Force MicroscopyR. WILLIAMSON<sup>1</sup>, AND C. MILLER<sup>1</sup>  
<sup>1</sup>Saint Louis University, St. Louis, MO**PS-8B-3-35** *In Vitro* Refractive Index Measurement of Acute Rat Brains Using Optical Coherence TomographyJ. SUN<sup>1</sup>, S. LEE<sup>1</sup>, M. SARTINORANONT<sup>1</sup>, AND H. XIE<sup>1</sup>  
<sup>1</sup>University of Florida, Gainesville, FL**PS-8B-3-36** Simultaneous Dynamic and Functional MRI of SpeechT. L. PAINE<sup>1</sup>, B. SUTTON<sup>1</sup>, AND C. CONWAY<sup>1</sup>  
<sup>1</sup>University of Illinois Urbana-Champaign, Urbana, IL**PS-8B-3-37** Reassessing the Ubiquity of Small-world NetworksQ. K. TELESFORD<sup>1</sup>, K. E. JOYCE<sup>1</sup>, S. HAYASAKA<sup>1</sup>, J. H. BURDETTE<sup>1</sup>, AND P. J. LAURIENT<sup>1</sup>  
<sup>1</sup>Wake Forest University Health Sciences, Winston-Salem, NC**PS-8B-3-38** Cortical Oxygenation Sensing Using Ruthenium-based Fluorescence Lifetime Imaging and 2P MicroscopyA. J. SALVAGGIO<sup>1</sup>, A. D. ESTRADA<sup>1</sup>, S. M. KAZMI<sup>1</sup>, AND A. K. DUNN<sup>1</sup>  
<sup>1</sup>The University of Texas at Austin, Austin, TX**PS-8B-3-39** Accurate Brain Infarction Volume Estimation Based on Image MappingA. DAWKINS<sup>1</sup>, AND W. ZHAO<sup>1</sup>  
<sup>1</sup>University of Miami, Coral Gables, FL**PS-8B-3-40** Chronic Cerebral Blood Flow Imaging with Multi-Exposure Speckle ImagingS. M. KAZMI<sup>1</sup>, A. B. PARTHASARATHY<sup>1</sup>, AND A. K. DUNN<sup>1</sup>  
<sup>1</sup>The University of Texas at Austin, Austin, TX**PS-8B-3-41** Measuring Cerebrovascular Oxygenation Changes Due to Acute, Focal Ischemia Using Two-photon MicroscopyA. D. ESTRADA<sup>1</sup>, S. M. KAZMI<sup>1</sup>, A. SALVAGGIO<sup>1</sup>, AND A. K. DUNN<sup>1</sup>  
<sup>1</sup>University of Texas at Austin, Austin, TX**PS-8B-3-42** Development of Amyloid-beta Targeting Nanoparticles for Imaging and TherapyE. A. TANIFUM<sup>1</sup>, I. DASGUPTA<sup>1</sup>, L. SUN<sup>2</sup>, I. DHANDE<sup>2</sup>, K. B. GHAGHADA<sup>1</sup>, A. V. ANNAPRAGADA<sup>1</sup>, AND J. ERIKSEN<sup>2</sup>  
<sup>1</sup>University of Texas Health Science Center at Houston, Houston, TX, <sup>2</sup>University of Houston, Houston, TX**PS-8B-3-43** Development of Methods for the Study of Traumatic Brain Injury Investigated Via Advanced ImagingB. M. VAUGHN<sup>1</sup>, B. JORTNER<sup>2</sup>, AND W. HARDY<sup>1</sup>  
<sup>1</sup>Virginia Tech, Blacksburg, VA, <sup>2</sup>Virginia-Maryland Regional College of Veterinary Medicine, Blacksburg, VA**Track: Cardiovascular Engineering – PS-8B-4****Vascular Permeability****PS-8B-4-44** A Model for Radioimmunotherapy Delivered Through Systemic AdministrationL. SHI<sup>1</sup>, AND B. FU<sup>1</sup>  
<sup>1</sup>City College of New York, New York, NY**PS-8B-4-45** Paracrine Influences on Aortic Endothelial Hydraulic ConductivityR. MATHURA<sup>1</sup>  
<sup>1</sup>The City College of New York, New York, NY**Track: Cardiovascular Engineering – PS-8B-5****Vascular Structure and Function****PS-8B-5-46** BSME 2010, Vessel StorageM. AMIN<sup>1</sup>, A. KUNKEL<sup>2</sup>, V. LE<sup>1</sup>, AND J. E. WAGENSEIL<sup>1</sup>  
<sup>1</sup>St. Louis University, St. Louis, MO, <sup>2</sup>Rice University, Houston, TX**PS-8B-5-47** Effect of Cigarette Smoking on Arterial Stiffness Re-interpreted Using a Structurally-based ModelM. S. ENEVOLDSEN<sup>1,2</sup>, J. D. HUMPHREY<sup>2</sup>, L. LÖNN<sup>3</sup>, J. A. JENSEN<sup>1</sup>, AND K-A. HENNEBERG<sup>1</sup>  
<sup>1</sup>Technical University of Denmark, Kongens Lyngby, Denmark, <sup>2</sup>Texas A&M University, College Station, TX, <sup>3</sup>Rigshospitalet, Denmark, Copenhagen, Denmark**PS-8B-5-48** CANCELED**PS-8B-5-49** Evaluation of Digital Replantation Surgery Using PhotoplethysmographyK. C. NAM<sup>1</sup>, K. H. JANG<sup>2</sup>, AND D. W. KIM<sup>1</sup>  
<sup>1</sup>Yonsei University Health System, Seoul, Korea, Republic of, <sup>2</sup>Yonsei University, Seoul, Korea, Republic of

**PS-8B-5-50** Directing Vascular Function by Modulating Vascular StructureP. W. ALFORD<sup>1,2</sup>, A. P. NESMITH<sup>1</sup>, J. N. SEYWERD<sup>1</sup>, AND K. K. PARKER<sup>1,2</sup><sup>1</sup>Disease Biophysics Group, Harvard University, Cambridge, MA, <sup>2</sup>Wyss Institute for Biologically Inspired Engineering, Boston, MA**PS-8B-5-51** Vascular Changes in Type 2 Diabetes Mellitus: Application to Restenosis After StentingH. WANG<sup>1</sup>, L. M. ELLWEIN<sup>1</sup>, J. R. KERSTEN<sup>2</sup>, AND J. F. LADISA<sup>1,2</sup><sup>1</sup>Marquette University, Milwaukee, WI, <sup>2</sup>Medical College of Wisconsin, Milwaukee, WI**PS-8B-5-52** Relation Between Mechanical Properties and Histology of Aortic Aneurysms Evaluated in a Rupture TestS. SUGITA<sup>1,2</sup>, T. MATSUMOTO<sup>1,2</sup>, T. OHASHI<sup>2</sup>, K. KUMAGAI<sup>2</sup>, H. AKIMOTO<sup>2</sup>, K. TABAYASHI<sup>2</sup>, AND M. SATO<sup>2</sup><sup>1</sup>Nagoya Institute of Technology, Nagoya, Japan, <sup>2</sup>Tohoku University, Sendai, Japan**PS-8B-5-53** Inverted DTM – A Possible Solution to the Cold Finger ProblemM. W. AKHTAR<sup>1</sup>, S. J. KLEIS<sup>1</sup>, AND R. W. METCALFE<sup>1</sup><sup>1</sup>University of Houston, Houston, TX**PS-8B-5-54** Ionizing Irradiation Alters Aortic Elasticity Measured as Pulse Wave Velocity.Y-Y. LIU<sup>1</sup>, M. BUTLIN<sup>1</sup>, T. KNITTEL<sup>2</sup>, R. SMEE<sup>2</sup>, AND A. AVOLIO<sup>1</sup><sup>1</sup>Australian School of Advanced Medicine, Sydney, NSW, Australia, <sup>2</sup>Prince of Wales Hospital, Sydney, NSW, Australia**PS-8B-5-55** Effects of Sleep Deprivation on Autonomic Nervous SystemD. W. KIM<sup>1</sup>, D. I. YANG<sup>2</sup>, K. C. NAM<sup>1</sup>, AND M. K. KWON<sup>1</sup><sup>1</sup>Yonsei University Health System, Seoul, Korea, Republic of, <sup>2</sup>Yonsei University, Seoul, Korea, Republic of**PS-8B-5-56** Regulation of Cathepsin K Activity by Monocytes and Arterial Endothelial Cells in Sickle Cell DiseaseP. M. KEEGAN<sup>1</sup>, B. E. GEE<sup>2</sup>, AND M. O. PLATT<sup>1</sup><sup>1</sup>Georgia Institute of Technology, Atlanta, GA, <sup>2</sup>Morehouse School of Medicine, Atlanta, GA**PS-8B-5-57** Regional Atherosclerotic Plaque Properties as Measured by Atomic Force MicroscopyH. N. HAYENGA<sup>1</sup>, A. TRACHE<sup>1,2</sup>, J. P. TRZECIAKOWSKI<sup>2</sup>, AND J. D. HUMPHREY<sup>1</sup><sup>1</sup>Texas A&M University, College Station, TX, <sup>2</sup>Texas A&M Health Science Center, College Station, TX**PS-8B-5-58** Variable Glycated Serum Albumin Modulates Endothelial Cell Culture ConditionsD. A. RUBENSTEIN<sup>1</sup>, Z. MARIA<sup>1</sup>, B. E. MORTON<sup>1</sup>, AND W. YIN<sup>1</sup><sup>1</sup>Oklahoma State University, Stillwater, OK**PS-8B-5-59** ROS Signaling Modulates Enhanced Cell Proliferation and Intimal Hyperplasia in HSV Cultured Ex VivoB. JODDAR<sup>1</sup>, R. K. REEN<sup>1</sup>, M. FIRSTENBERG<sup>1</sup>, AND K. J. GOOCH<sup>1</sup><sup>1</sup>The Ohio State University, Columbus, OH**PS-8B-5-60** Elastin Degradation Reduces the Structure Stability of ArteriesB. HAN<sup>1</sup>, A. NORTHCUTT<sup>1</sup>, AND H-C. HAN<sup>1</sup><sup>1</sup>University of Texas at San Antonio, San Antonio, TX**PS-8B-5-61** Mechanical Measurements of the Sub-Endothelial Layer in Arteries using IndentationJ. M. PELOQUIN<sup>1</sup>, J. HUYNH<sup>1</sup>, AND C. A. REINHART-KING<sup>1</sup><sup>1</sup>Cornell University, Ithaca, NY**PS-8B-5-62** In Vitro Mechanical Testing of Hydration-Controlled Arterial TissueD. SHAHMIRZADI<sup>1</sup>, AND A. H. HSIEH<sup>1</sup><sup>1</sup>University of Maryland, College Park, MD**PS-8B-5-63** Spatiotemporal Dynamics of Vasoconstriction in Small ArteriesS. PINTO<sup>1</sup>, S. YASOTHARAN<sup>1</sup>, J. YANG<sup>1</sup>, J. VOIGTLÄNDER-BOLZ<sup>2</sup>, M. SAUVE<sup>1</sup>, C. LOCHOVSKY<sup>1</sup>, S-S. BOLZ<sup>1</sup>, AND A. GÜNTHER<sup>1</sup><sup>1</sup>University of Toronto, Toronto, Ontario, Canada, <sup>2</sup>St. Michael's Hospital, Toronto, Ontario, Canada**PS-8B-5-64** The Combined Effects of Glycated Albumin and Tobacco Smoke Extracts on Endothelial Cells and PlateletsB. E. MORTON<sup>1</sup>, W. YIN<sup>1</sup>, AND D. A. RUBENSTEIN<sup>1</sup><sup>1</sup>Oklahoma State University, Stillwater, OK**PS-8B-5-65** A Balance Point Approach to Characterize Adaptation of Arterial NetworksS. F. KNEZEK<sup>1</sup>, P. H. NGUYEN<sup>1</sup>, AND C. M. QUICK<sup>1</sup><sup>1</sup>Michael E. DeBakey Institute, TX A&M University, College Station, TX**PS-8B-5-66** Structural and Hemodynamic Effects of Chronic Pulmonary Artery Stenosis in a Murine ModelH. RAZAVI<sup>1</sup>, S. ZARAFSHAR<sup>1</sup>, H. SAWADA<sup>1</sup>, C. XU<sup>1</sup>, J. A. FEINSTEIN<sup>1</sup>, AND C. A. TAYLOR<sup>1</sup><sup>1</sup>Stanford University, Stanford, CA**PS-8B-5-67** Inverse Mechanics of Cardiovascular TissuesR. RAGHUPATHY<sup>1</sup>, C. M. WITZENBURG<sup>1</sup>, A. OLTEAN<sup>1</sup>, S. P. LAKE<sup>1</sup>, AND V. BAROCAS<sup>1</sup><sup>1</sup>U. Minnesota, Minneapolis, MN**PS-8B-5-68** The Elastic and Viscoelastic Behaviors of Aortic Elastin NetworkY. ZOU<sup>1</sup>, AND K. Y. ZHANG<sup>1</sup><sup>1</sup>Boston University, Boston, MA**PS-8B-5-69** Role of HIV Proteins in Biomechanically Mediated Protease Activity and Arterial RemodelingI. KENNEDY<sup>1</sup>, L. HANSON<sup>1</sup>, J. RAYKIN<sup>1</sup>, R. SUTLIFF<sup>2</sup>, R. GLEASON<sup>1</sup>, AND M. PLATT<sup>1</sup><sup>1</sup>Georgia Tech, Atlanta, GA, <sup>2</sup>Emory, Atlanta, GA**PS-8B-5-70** Surface Characterization and Adhesion Properties of Decellularized HUVL. P. JACKSON<sup>1</sup>, P. MCFETRIDGE<sup>2</sup>, M. NOLLERT<sup>1</sup>, AND C. TOWNSEND<sup>1</sup><sup>1</sup>University of Oklahoma, Norman, OK, <sup>2</sup>University of Florida, Gainesville, FL**Track: Cellular and Molecular Engineering – PS-8B-6****Cellular Engineering and Modeling****PS-8B-6-71** Force Generation on the Nucleus by Dynein Walking on Dynamic Microtubules is Sufficient to Explain Nuclear RotationJ. WU<sup>1</sup>, K. C. LEE<sup>1</sup>, R. B. DICKINSON<sup>1</sup>, AND T. P. LELE<sup>1</sup><sup>1</sup>University of Florida, Gainesville, FL**PS-8B-6-72** Cytotoxicity of Ultrashort Electric Pulse Exposure in Multiple Cell TypesB. L. IBEY<sup>1</sup>, C. C. ROTH<sup>2</sup>, J. A. BERNHARD<sup>1</sup>, D. R. DALZELL<sup>1</sup>, G. J. WILMINK<sup>1</sup>, AND A. G. PAKHOMOV<sup>3</sup><sup>1</sup>Air Force Research Laboratory, Brooks City-Base, TX, <sup>2</sup>General Dynamics IT, Brooks City-Base, TX, <sup>3</sup>Old Dominion University, Norfolk, VA**PS-8B-6-73** Structural and Geometric Effects in a Synthetic System of Exactly Two Kinesin-I MotorsJ. DRIVER<sup>1</sup>, A. ROGERS<sup>1</sup>, D. K. JAMISON<sup>1</sup>, R. DAS<sup>1</sup>, A. KOLOMEISKY<sup>1</sup>, AND M. DIEHL<sup>1</sup><sup>1</sup>Rice University, Houston, TX**PS-8B-6-74** Electromechanical Coupling in the Membrane-Protein Motor Complex Associated with PrestinN. NILSEN<sup>1</sup>, W. E. BROWNELL<sup>2</sup>, S. X. SUN<sup>1</sup>, AND A. A. SPECTOR<sup>1</sup><sup>1</sup>Johns Hopkins University, Baltimore, MD, <sup>2</sup>Baylor College of Medicine, Houston, TX**PS-8B-6-75** Electrical Resistivity Changes in Splenic Tissue Under CompressionR. E. DODDE<sup>1</sup>, AND A. SHIH<sup>1</sup><sup>1</sup>University of Michigan, Ann Arbor, MI**PS-8B-6-76** Estimation of Microtubule GTP Cap Size In VivoD. SEETAPUN<sup>1</sup>, AND D. J. ODDE<sup>1</sup><sup>1</sup>University of Minnesota, Minneapolis, MN

**PS-8B-6-77** Pericellular Conditions Regulate Extent of Cell-mediated Compaction of Collagen GelsM. D. STEVENSON<sup>1</sup>, A. L. SIEMINSKI<sup>2</sup>, C. M. MCLEOD<sup>2</sup>, F. J. BYFIELD<sup>3</sup>, V. H. BAROCAS<sup>4</sup>, AND K. J. GOOCH<sup>1</sup><sup>1</sup>Ohio State University, Columbus, OH, <sup>2</sup>Franklin W. Olin College of Engineering, Needham, MA, <sup>3</sup>University of Pennsylvania, Philadelphia, PA, <sup>4</sup>University of Minnesota, Minneapolis, MN**PS-8B-6-78** Metabolic Flux Determination in Perfused Livers by Mass Balance Analysis: Effect of FastingM. A. ORMAN<sup>1</sup>, I. ANDROULAKIS<sup>1</sup>, F. BERTHIAUME<sup>1</sup>, AND M. IERAPETRIYOU<sup>1</sup><sup>1</sup>Rutgers University, Piscataway, NJ**PS-8B-6-79** Retinoic Acid-Induced Smooth Muscle Differentiation From Progenitor Cells is Regulated by ECM CuesE. LOGSDON<sup>1</sup>, J. PERLEY<sup>1</sup>, Q. GAN<sup>1</sup>, A. SOMLYO<sup>1</sup>, G. OWENS<sup>1</sup>, AND T. SKALAK<sup>1</sup><sup>1</sup>University of Virginia, Charlottesville, VA**PS-8B-6-80** Insights from Modeling Natural Killer Cell Proliferative Responses to Cytokine StimulationY. M. ZHAO<sup>1</sup>, AND A. R. FRENCH<sup>2</sup><sup>1</sup>Washington University in St. Louis, Saint Louis, MO, <sup>2</sup>Washington University School of Medicine, Saint Louis, MO**PS-8B-6-81** Influence of Subcellular Structures on Single Vascular Smooth Muscle Cell MechanicsS. T. WOOD<sup>1</sup>, B. C. DEAN<sup>1</sup>, AND D. DEAN<sup>1</sup><sup>1</sup>Clemson University, Clemson, SC**PS-8B-6-82** An Experimental Study on Cell Membrane Transport During Desiccation for BiopreservationJ. L. JIMENEZ-RIOS<sup>1</sup>, S. BHOWMICK<sup>1</sup>, AND A. J. FOWLER<sup>1</sup><sup>1</sup>University of Massachusetts Dartmouth, North Dartmouth, MA**PS-8B-6-83** A Coarse-Grain Molecular Dynamics Model for Sickle Hemoglobin FibersH. LI<sup>1</sup>, AND G. LYKOTRAFITIS<sup>1</sup><sup>1</sup>University of Connecticut, Storrs, CT**PS-8B-6-84** Uncovering Morphological and Morphogenetic Features in Epithelia by Eliminating Statistical BiasM. P. MIKLIUS<sup>1</sup>, AND S. HILGENFELDT<sup>1,2</sup><sup>1</sup>Northwestern University, Evanston, IL, <sup>2</sup>University of Illinois at Urbana-Champaign, Urbana, IL**PS-8B-6-85** Computational Model of Force Propagation in Fibrous Extracellular MatrixX. MA<sup>1</sup>, K. J. GOOCH<sup>1</sup>, S. N. GHADIALI<sup>1</sup>, AND R. T. HART<sup>1</sup><sup>1</sup>The Ohio State University, Columbus, OH**PS-8B-6-86** Expanding the Genetic Code in Mammalian CellsL. XIANG<sup>1</sup>, K. MONCIVAIS<sup>1</sup>, AND Z. J. ZHANG<sup>1</sup><sup>1</sup>University of Texas at Austin, Austin, TX**PS-8B-6-87** Single Cell Based Modeling of Epithelial Tissue: A Biomechanical ApproachY. JAMALI<sup>1</sup>, M. AZIMI<sup>1</sup>, AND M. MOFRAD<sup>1</sup><sup>1</sup>University of California Berkeley, Berkeley, CA**PS-8B-6-88** Modulating the Cellular Accumulation of Toxic Misfolded Alpha-synucleinK. KILPATRICK<sup>1</sup>, AND L. SEGATORI<sup>1</sup><sup>1</sup>Rice University, Houston, TX**PS-8B-6-89** Type-I Collagen Gels are Structurally and Mechanically Inhomogeneous and AnisotropicX. MA<sup>1</sup>, M. WEBER<sup>1</sup>, M. STEVENSON<sup>1</sup>, K. J. GOOCH<sup>1</sup>, S. N. GHADIALI<sup>1</sup>, AND R. T. HART<sup>1</sup><sup>1</sup>The Ohio State University, Columbus, OH**PS-8B-6-90** Integrated Feedback Regulation of the Epidermal Growth Factor Receptor in Non-Small Cell Lung CancerA. J. MACDONALD<sup>1</sup>, AND M. J. LAZZARA<sup>1</sup><sup>1</sup>University of Pennsylvania, Philadelphia, PA**Track: Devices: Nano to Micro – PS-8B-7****Micro and Nanostructured Biomaterials****PS-8B-7-91** Nanoscale Diffusion-Limiting Biopolyelectrolyte MultilayersJ. PARK<sup>1</sup>, AND M. J. MCSHANE<sup>1</sup><sup>1</sup>Texas A&M University, College Station, TX**PS-8B-7-92** The Effect of Substrate Topography on Endocytosis and TransfectionA. F. ADLER<sup>1</sup>, AND K. W. LEONG<sup>1</sup><sup>1</sup>Duke University, Durham, NC**PS-8B-7-93** Proximal Effects of Ultraviolet Light Absorbers and Polymer Matrix in the Photo-Protection of [beta]-CaroteneK. MORABITO<sup>1</sup>, K. GILIDA<sup>2</sup>, N. SHAPELY<sup>2</sup>, AND A. TRIPATHI<sup>1</sup><sup>1</sup>Brown University, Providence, RI, <sup>2</sup>Rutgers University, New Brunswick, NJ**PS-8B-7-94** Micro-Encapsulation as a Means to Modulate Nanomaterial-Cell InteractionsD. W. RITTER<sup>1</sup>, A. A. ROMOSER<sup>1</sup>, R. MAJITHIA<sup>1</sup>, K. E. MEISSNER<sup>1</sup>, C. M. SAYES<sup>1</sup>, AND M. J. MCSHANE<sup>1</sup><sup>1</sup>Texas A&M University, College Station, TX**PS-8B-7-95** Nanoscopic Mechanical Anisotropy in Hydrogel SurfacesM. FLORES-MERINO<sup>1,2</sup>, S. CHIRASATISIN<sup>3</sup>, C. LOPRESTI<sup>1,2</sup>, G. REILLY<sup>2</sup>, A. ENGLER<sup>3</sup>, AND G. BATTAGLIA<sup>1</sup><sup>1</sup>University of Sheffield, Western Bank, Sheffield, United Kingdom, <sup>2</sup>University of Sheffield, Broad Lane, Sheffield, United Kingdom, <sup>3</sup>University of California, San Diego, La Jolla, CA**PS-8B-7-96** Patterning and Topographical Control of PEG Hydrogel Micro/Nanostructure by Dip-pen Nanolithography<sup>®</sup>J-W. JANG<sup>1</sup>, P. STILES<sup>1</sup>, AND S. R. NETTIKADAN<sup>1</sup><sup>1</sup>Nanolnk Inc., Skokie, IL**PS-8B-7-97** Micropatterning Polymeric Nanofibers with PEG Hydrogel for Application of Protein MicroarrayY. LEE<sup>1</sup>, H. LEE<sup>1</sup>, K. SON<sup>1</sup>, S. PARK<sup>1</sup>, S. NAM<sup>1</sup>, Y. PARK<sup>1</sup>, AND W-G. KOH<sup>1</sup><sup>1</sup>Yonsei Univ., Seodaemun-gu, Seoul, Korea, Republic of**PS-8B-7-98** Study of Parylene C as Non-Hermetic Coating for Micropackaging of Implantable MicrodeviceH-I. KUO<sup>1</sup>, R. ZHANG<sup>1</sup>, AND W. KO<sup>1</sup><sup>1</sup>Case Western Reserve University, Cleveland, OH**PS-8B-7-99** Effect of Size on Nanoparticle Uptake in a Vascular Endothelial Cell Model of AngiogenesisA. L. DOIRON<sup>1</sup>, J. SPENCER<sup>1</sup>, AND K. D. RINKER<sup>1</sup><sup>1</sup>University of Calgary, Calgary, Alberta, Canada**PS-8B-7-100** Window into a Microworld: Microfluidic System for Studying Microbial Growth in Porous MediaD. A. MARKOV<sup>1</sup>, P. C. SAMSON<sup>1</sup>, D. K. SCHAFER<sup>1</sup>, A. DHUMMAKUPT<sup>1</sup>, J. P. WIKSWO<sup>1</sup>, AND L. M. SHOR<sup>2</sup><sup>1</sup>Vanderbilt University, Nashville, TN, <sup>2</sup>University of Connecticut, Storrs, CT**PS-8B-7-101** Influence of TiO<sub>2</sub> Nanotube Crystallinity on Cell BehaviourG. SMITH<sup>1</sup>, K. KOLIND<sup>2</sup>, M. FOSS<sup>2</sup>, F. BESENBACHER<sup>2</sup>, AND S. JIN<sup>1</sup><sup>1</sup>University of California San Diego, La Jolla, CA, <sup>2</sup>Aarhus University, Aarhus, Denmark**PS-8B-7-102** Understanding the Mechanics of the Insect Respiratory System Could Advance Tissue EngineeringM. R. WEBSTER<sup>1</sup>, J. TWIGG<sup>1</sup>, J. J. SOCHA<sup>1</sup>, AND R. DE VITA<sup>1</sup><sup>1</sup>Virginia Polytechnic Institute and State University, Blacksburg, VA

**PS-8B-7-103** Decreased Lung Carcinoma Cell Function on Select Polymer Nanometer Surface FeaturesL. ZHANG<sup>1</sup>, AND T. WEBSTER<sup>1</sup><sup>1</sup>Brown University, providence, RI**PS-8B-7-104** Process Characterization: Reactive Ion Etching of Micro Hot-embossed Poly(lactic acid) FilmsR. TEWARI<sup>1,2</sup>, K. L. VANGA<sup>1,2</sup>, V. R. KNUDSEN<sup>1,2</sup>, AND C. FRIEDRICH<sup>1,2</sup><sup>1</sup>Michigan Technological University, Houghton, MI, <sup>2</sup>Multi Scale Technologies Institute, Houghton, MI**PS-8B-7-105** Decreased Attachment of Epithelial Cells and Bacteria to Lubricin Coated Intraocular LensesG. E. ANINWENE II<sup>1</sup>, E. TAYLOR<sup>1</sup>, T. J. WEBSTER<sup>1</sup>, AND G. D. JAY<sup>1</sup><sup>1</sup>Brown University, Providence, RI**PS-8B-7-106** Improvement of Nanofiber Morphology through Electrospinning Process PausingD. KARATAS<sup>1</sup>, K. M. SAWICKA<sup>1</sup>, AND S. R. SIMON<sup>1</sup><sup>1</sup>Stony Brook University, Stony Brook, NY**PS-8B-7-107** The Bio-Assembler: 3D Cell Culturing Using Magnetic LevitationC. S. FILGUEIRA<sup>1</sup>, C. P. BERTUCCI<sup>1</sup>, AND G. R. SOUZA<sup>1</sup><sup>1</sup>Nano<sup>3</sup>D Biosciences, Inc., Houston, TX**PS-8B-7-108** Chitosan Enhances Cell Adhesion and Spreading on Nanocomposite FilmsA. K. GAHARWAR<sup>1</sup>, P. J. SCHEXNAIDER<sup>1</sup>, C.-J. WU<sup>1</sup>, Q. JIN<sup>1</sup>, AND G. SCHMIDT<sup>1</sup><sup>1</sup>Purdue University, West Lafayette, IN**PS-8B-7-109** UV-Modulated Elastomeric Microstructures for Studying Cell MechanicsL-T. JIANG<sup>1</sup>, R. OKADA<sup>1</sup>, AND J. FU<sup>1</sup><sup>1</sup>University of Michigan, Ann Arbor, MI**PS-8B-7-110** Bacterial Catch-and-Release Using Thermally Responsive Multiphoton Fabricated Protein HydrogelsJ. L. CONNELL<sup>1</sup>, E. T. RITSCHDORFF<sup>1</sup>, M. WHITELEY<sup>1</sup>, AND J. B. SHEAR<sup>1</sup><sup>1</sup>The University of Texas at Austin, Austin, TX**PS-8B-7-111** Multifunctional Iron Oxide Core Gold Shell Nanoclusters for Optical and Magnetic Cellular ImagingA. U. BORWANKAR<sup>1</sup>, K. YOON<sup>1</sup>, L. L. MA<sup>1</sup>, M. MEHRMOHAMMADI<sup>1</sup>, B. WILLSEY<sup>1</sup>, K. SOKOLOV<sup>1,2</sup>, S. EMELIANOV<sup>1</sup>, AND K. JOHNSTON<sup>1</sup><sup>1</sup>The University of Texas at Austin, Austin, TX, <sup>2</sup>UT M.D. Anderson Cancer Center, Austin, TX**PS-8B-7-112** Spatially Controlled Electrospun Solid Gradient Nanofibers for Guided Spiral Ganglion Neuron CultureP. F. JAO<sup>1</sup>, W. SUN<sup>2</sup>, Y. K. YOON<sup>1</sup>, AND G. J. KIM<sup>3</sup><sup>1</sup>Dept. of Electrical Engineering, University at Buffalo, The State University of New York, Buffalo, NY, <sup>2</sup>Dept. of Communicative Disorders & Sciences, University at Buffalo, The State University of New York, Buffalo, NY, <sup>3</sup>Dept. of Biomedical Engineering, University at Buffalo, The State University of New York, Buffalo, NY**PS-8B-7-113** Reduced Resistance to Air Flow from Nanomodified Endotracheal TubesM. C. MACHADO<sup>1</sup>, K. TARQUINIO<sup>2</sup>, AND T. WEBSTER<sup>1</sup><sup>1</sup>Brown University, Providence, RI, <sup>2</sup>Rhode Island Hospital, Providence, RI**PS-8B-7-114** "The Disappearing Substrate": SiO<sub>2</sub> Etch Rate by Common Buffers in Genomic and Proteomic TechnologyS. AHN<sup>1</sup>, P. SPUHLER<sup>1</sup>, M. CABODI<sup>1</sup>, AND S. UNLU<sup>1</sup><sup>1</sup>Boston University, Boston, MA**PS-8B-7-115** Polystyrene Microlens Array by Shrink-induced PDMS MoldD. DYER<sup>1</sup>, S. SHREIM<sup>1</sup>, S. JAYADEV<sup>1</sup>, D. TAYLOR<sup>1</sup>, V. LEW<sup>1</sup>, E. BOTVINICK<sup>1</sup>, AND M. KHINE<sup>1</sup><sup>1</sup>University of California, Irvine, Irvine, CA**PS-8B-7-116** STEP enabled Long Term Culture of Hepatocytes on Cross-Hatch Pattern of Sub-micron Polymeric FibersA. S. NAIN<sup>1</sup>, AND G. MICHALOPOULOS<sup>2</sup><sup>1</sup>Virginia Tech, Blacksburg, VA, <sup>2</sup>University of Pittsburgh, Pittsburgh, PA**PS-8B-7-117** Silk for High Fidelity MicromoldingD. N. BRESLAUER<sup>1</sup>, F. B. MYERS<sup>1</sup>, E. P. LEE<sup>1</sup>, B. W. TURNER<sup>1</sup>, S. J. MULLER<sup>1</sup>, AND L. P. LEE<sup>1</sup><sup>1</sup>UC Berkeley, Berkeley, CA**PS-8B-7-118** Fabrication of Quantum Dot-Protein Arrays and their Application in Cell Adhesion AssaysZ. R. TAYLOR<sup>1</sup>, AND D. W. SCHMIDTKE<sup>1</sup><sup>1</sup>University of Oklahoma, Norman, OK**Track: Devices: Nano to Micro – PS-8B-8****Miniature Energy Generation & Harvesting for Bio****PS-8B-8-119** An Optimization Method for Electromagnetic Energy Delivery to Electronic ImplantsS. DEB<sup>1</sup>, W-D. HUANG<sup>1</sup>, AND J-C. CHIAO<sup>1</sup><sup>1</sup>University of Texas at Arlington, Arlington, TX**PS-8B-8-120** Photosynthetically Active Protoplasts for Power Scavenging – Absorbance and Optical Density AnalysisA. SHAHID<sup>1</sup>, A. ILYAS<sup>1</sup>, N. OBULAREDDY<sup>1</sup>, M. H-C. JIN<sup>1</sup>, M. MELOTTO<sup>1</sup>, AND S. M. IQBAL<sup>1</sup><sup>1</sup>University of Texas Arlington, Arlington, TX**Track: Drug Delivery Systems – PS-8B-9****Non-Parental Delivery****PS-8B-9-121** Whole-Animal Imaging and Immunological Analysis of Oral Vaccine Delivery Using Polymer ParticlesA. V. LI<sup>1</sup>, M. YEN<sup>1</sup>, AND D. J. IRVINE<sup>1,2</sup><sup>1</sup>Massachusetts Institute of Technology, Cambridge, MA, <sup>2</sup>Howard Hughes Medical Institute, Chevy Chase, MD**PS-8B-9-122** Carbohydrate Surface Modification for Oral Protein DeliveryM. A. PHILLIPS<sup>1</sup>, AND N. A. PEPPAS<sup>1</sup><sup>1</sup>The University of Texas at Austin, Austin, TX**PS-8B-9-123** Nanoparticulate Delivery of Targeted Immunotherapies for Inflammatory Bowel DiseaseN. CAPURSO<sup>1</sup>, M. LOOK<sup>1</sup>, R. RAGHEB<sup>1</sup>, S. DEMENTO<sup>1</sup>, C. ABRAHAM<sup>1</sup>, AND T. FAHMY<sup>1</sup><sup>1</sup>Yale University, New Haven, CT**PS-8B-9-124** A Novel Vaccine ParadigmK. SAWICKA<sup>1</sup>, AND S. SIMON<sup>1</sup><sup>1</sup>Stony Brook University, Stony Brook, NY**PS-8B-9-125** Fluoride Release from Dental Cement with Different Redox SystemsJ. LEE<sup>1</sup>, AND B. SUH<sup>1</sup><sup>1</sup>Bisco Dental Products, Schaumburg, IL

**Track: Drug Delivery Systems – PS-8B-10****Novel Biomaterials and Scaffolds****PS-8B-10-126 Stable Gold Nanoparticles via Functionalization within Biodegradable Hydrogels**H. D. CHIRRA<sup>1</sup>, D. SPENCER<sup>1</sup>, AND J. HILT<sup>1</sup><sup>1</sup>University of Kentucky, Lexington, KY**Track: Neural Engineering – PS-8B-11****Drug Delivery and Tissue Engineering in the Nervous System****PS-8B-11-127 Direct Electrospinning of PEDOT Microfibers for Neural Tissue Engineering**Z-Q. FENG<sup>1,2</sup>, M. K. LEACH<sup>2</sup>, Y. NAIM<sup>2</sup>, AND J. M. COREY<sup>2,3</sup><sup>1</sup>Southeast University, Nanjing, China, People's Republic of, <sup>2</sup>University of Michigan, Ann Arbor, MI, <sup>3</sup>VAMC, Ann Arbor, MI**PS-8B-11-128 A Novel Microfluidic Platform for Axon-Specific Injury**S. HOSMANE<sup>1</sup>, A. VENKATESAN<sup>1</sup>, AND N. THAKOR<sup>1</sup><sup>1</sup>Johns Hopkins University, Baltimore, MD**PS-8B-11-129 Translational Technology for Neural Protection: HPLC Quantification of Timolol Maleate Drug-Delivery**A. SHOFFSTALL<sup>1</sup>, E. LAVIK<sup>1</sup>, A. DUMITRESCU<sup>2</sup>, M. KUEHN<sup>2</sup>, AND Y. KWON<sup>2</sup><sup>1</sup>Case Western Reserve University, Cleveland, OH, <sup>2</sup>University of Iowa, Iowa City, IA**PS-8B-11-130 Transparent CUPE Nerve Guides Allow Evaluation of Luminal Fillers and Mediate Nerve Gap Repair**S. DASH<sup>1</sup>, R. TRAN<sup>1</sup>, J. YANG<sup>1</sup>, AND M. ROMERO-ORTEGA<sup>1</sup><sup>1</sup>University of Texas at Arlington, Arlington, TX**PS-8B-11-131 Addition of Chitosan to Tissue Engineering Hydrogels for Neural Regeneration Applications**J. M. ZUIDEMA<sup>1</sup>, M. M. PAP<sup>2</sup>, E. J. MINNER<sup>2</sup>, D. B. JAROCH<sup>3</sup>, F. A. MORRISON<sup>2</sup>, AND R. J. GILBERT<sup>1</sup><sup>1</sup>Rensselaer Polytechnic Institute, Troy, NY, <sup>2</sup>Michigan Technological University, Houghton, MI, <sup>3</sup>Purdue University, West Lafayette, IN**PS-8B-11-132 Development of a Composite Hydrogel Containing Electrospun Fibers for Spinal Cord Injury**C. J. RIVET<sup>1</sup>, H. WANG<sup>2</sup>, AND R. J. GILBERT<sup>1</sup><sup>1</sup>Rensselaer Polytechnic Institute, Troy, NY, <sup>2</sup>Syracuse University, Syracuse, NY**PS-8B-11-133 Electrospun Polycaprolactone/Elastin Aligned Fibrous Scaffolds for Schwann Cells**I-H. LIN<sup>1</sup>, AND C. MILLER<sup>1</sup><sup>1</sup>Saint Louis University, St Louis, MO**PS-8B-11-134 Using micro-Computed Tomography to assess Transport Parameters through Fluid Spaces of the Cochlea**M. GLADSTONE<sup>1</sup>, X. ZHU<sup>1,2</sup>, A. LUEBKE<sup>1</sup>, R. D. FRISINA<sup>1,2</sup>, AND D. A. BORKHOLDER<sup>1,3</sup><sup>1</sup>University of Rochester, Rochester, NY, <sup>2</sup>National Technical Institute, Rochester Institute of Technology, Rochester, NY, <sup>3</sup>Rochester Institute of Technology, Rochester, NY**PS-8B-11-135 Treatment of Spinal Cord Injury with Keratin Biomaterial Improves Survival and Recovery in Rats**B. FEARING<sup>1</sup>, C. HARTLEY<sup>1</sup>, O. DAYTON<sup>1</sup>, L. PACE<sup>1</sup>, L. BURNETT<sup>2</sup>, T. ABOUSHWAREB<sup>1</sup>, AND M. VAN DYKE<sup>1</sup><sup>1</sup>Wake Forest University School of Medicine, Winston Salem, NC, <sup>2</sup>KeraNetics, Winston Salem, NC**PS-8B-11-136 Analysis of CAMs and ECM Proteins on Schwann Cell-mediated Neurite Guidance**A. M. SEGGIO<sup>1</sup>, A. NARAYANASWAMY<sup>1</sup>, B. ROYSAM<sup>1</sup>, S. AGUILAR<sup>1</sup>, A. MCGREGOR<sup>1</sup>, AND D. THOMPSON<sup>1</sup><sup>1</sup>Rensselaer Polytechnic Institute, Troy, NY**PS-8B-11-137 The Functional Recovery of Neurons after Traumatic Brain Injury**M. K. KUTZING<sup>1</sup>, C. LANGHAMMER<sup>1</sup>, AND B. L. FIRESTEIN<sup>1</sup><sup>1</sup>Rutgers University, Piscataway, NJ**PS-8B-11-138 Aligned Collagen Threads Direct Neuronal Growth Due to Microtopography Not Nanotopography**M. ABU-RUB<sup>1</sup>, K. L. BILLIAR<sup>2</sup>, B. RODRIGUEZ<sup>2</sup>, D. ZEUGOLIS<sup>1</sup>, AND A. PANDIT<sup>1</sup><sup>1</sup>National University of Ireland, Dangan, Galway, Ireland, <sup>2</sup>Worcester Polytechnic Institute, Worcester, MA, <sup>3</sup>University College, Dublin, Leinster, Ireland**PS-8B-11-139 Design of Backflow-Free Catheters Based on Micro-fluid Dynamics**O. V. IVANCHENKO<sup>1</sup>, E. LUESHEN<sup>1</sup>, N. SINDHWANI<sup>1</sup>, Y. RAWASH<sup>1</sup>, AND A. LINNINGER<sup>1</sup><sup>1</sup>UIC, Chicago, IL**PS-8B-11-140 Schwann Cell-Seeded Nanofiber Scaffolds Enhance and Direct Axonal Regeneration**M. R. MACEWAN<sup>1</sup>, J. XIE<sup>1</sup>, N. JESURAJ<sup>1</sup>, D. SIEWE<sup>1</sup>, X. LI<sup>1</sup>, S. SAKIYAMA-ELBERT<sup>1</sup>, AND Y. XIA<sup>1</sup><sup>1</sup>Washington University, Saint Louis, MO**PS-8B-11-141 Tunable 3D Hyaluronic Acid Hydrogels for Differentiation of Progenitors into Dopamine Neurons**Z. Z. KHAING<sup>1</sup>, S. K. SEIDLITS<sup>1</sup>, K. SLIVERBERG<sup>1</sup>, S. A. GEISSLER<sup>1</sup>, AND C. E. SCHMIDT<sup>1</sup><sup>1</sup>UT Austin, Austin, TX**PS-8B-11-142 Microfluidic Devices for Studying Intercellular Communication Between Dorsal Root Ganglia (DRG)**N. JAIN<sup>1</sup>, B. J. PFISTER<sup>1</sup>, AND R. PEREZ-CASTILLEJOS<sup>1</sup><sup>1</sup>NJIT, Newark, NJ**PS-8B-11-143 Aligned 6-Aminonicotinamide Releasing PLLA Fibers for Repair of the Injured Spinal Cord**N. SCHAUB<sup>1</sup>, AND R. J. GILBERT<sup>2</sup><sup>1</sup>Michigan Technological University, Houghton, MI, <sup>2</sup>Rensselaer Polytechnic Institute, Troy, NY**Track: Neural Engineering – PS-8B-12****Neural Modeling****PS-8B-12-144 Analysis of Spatio-temporal Odor Codes in the Locust Olfactory System**B. RAMAN<sup>1</sup>, J. JOSEPH<sup>2</sup>, J. TANG<sup>2</sup>, AND M. STOPFER<sup>2</sup><sup>1</sup>Washington University, St. Louis, MO, <sup>2</sup>National Institutes of Health, Bethesda, MD**PS-8B-12-145 Quantifying the Effectiveness of Different Targets of Deep Brain Stimulation for Parkinson's Disease Using a Computational Model of the Basal Ganglia**R. Y. QI<sup>1</sup>, A. R. KENT<sup>1</sup>, AND W. M. GRILL<sup>1</sup><sup>1</sup>Duke University, Durham, NC**PS-8B-12-146 A Unifying Nonlinear Dynamic Model of Hippocampal Population Activities for Multiple Events During a Memory-dependent Behavioral Task**D. SONG<sup>1</sup>, R. H. CHAN<sup>1</sup>, V. Z. MARMARELIS<sup>1</sup>, R. E. HAMPSON<sup>2</sup>, S. A. DEADWYLER<sup>2</sup>, AND T. W. BERGER<sup>1</sup><sup>1</sup>University of Southern California, Los Angeles, CA, <sup>2</sup>Wake Forest University, Winston-Salem, NC**PS-8B-12-147 Development and Validation of a FE Model of the Rat Brain Subjected to Air Shock Loading**F. ZHU<sup>1</sup>, H. MAO<sup>1</sup>, C. CHOU<sup>1</sup>, C. WAGNER<sup>1</sup>, X. JIN<sup>1</sup>, A. D. LEONARDI<sup>1</sup>, P. J. VANDEVORD<sup>1</sup>, C. A. BIR<sup>1</sup>, K. H. YANG<sup>1</sup>, AND A. I. KING<sup>1</sup><sup>1</sup>Wayne State University, Detroit, MIPS = Poster Session  
OP = Oral Presentation



**PS-8B-12-148** Power Flow in the Sandwich Model of the CochleaD. KIM<sup>1,2</sup>, D. C. MOUNTAIN<sup>1,2</sup>, AND A. E. HUBBARD<sup>1,2</sup><sup>1</sup>Boston University, Boston, MA, <sup>2</sup>Boston University Center for Hearing Research, Boston, MA**PS-8B-12-149** Macro- to Micro- Biomechanics of Traumatic Brain InjuryK. D. BROWNE<sup>1</sup>, C. MIETUS<sup>1</sup>, R. KRAFT<sup>2</sup>, AND D. CULLEN<sup>1</sup><sup>1</sup>University of Pennsylvania, Philadelphia, PA, <sup>2</sup>U.S. Army Research Laboratory, Aberdeen Proving Ground, MD**PS-8B-12-150** Anatomically Detailed Micromechanical Model of the Organ of Corti Including Radial Microfluid FlowB. F. ZAGADOU<sup>1</sup>, P. E. BARBONE<sup>1</sup>, AND D. C. MOUNTAIN<sup>1</sup><sup>1</sup>Boston University, Boston, MA**PS-8B-12-151** Spatiotemporal Investigation of Gamma Activity in the Human Epileptic BrainM. COTIC<sup>1</sup>, O. C. ZALAY<sup>1</sup>, T. VALIANTE<sup>2</sup>, D. ANDRADE<sup>2</sup>, P. L. CARLEN<sup>1,2</sup>, AND B. L. BARDAKJIAN<sup>1</sup><sup>1</sup>University of Toronto, Toronto, Ontario, Canada, <sup>2</sup>Toronto Western Research Institute, Toronto, Ontario, Canada**PS-8B-12-152** FDEHMT: A Finite Difference Electromagnetic Head Modeling ToolboxH. V. DANG<sup>1</sup>, AND K. T. NG<sup>1</sup><sup>1</sup>New Mexico State University, Las Cruces, NM**PS-8B-12-153** *In Silico* Investigation of Astrocytic Gliotransmission in Synaptic Signal ProcessingV. R. TIRUVADI<sup>1</sup>, P. SINGH<sup>1</sup>, AND D. F. MEANEY<sup>1</sup><sup>1</sup>University of Pennsylvania, Philadelphia, PA**PS-8B-12-154** Characterization of the Glial Scar using Raman Spectroscopy and MicroindentationT. SAXENA<sup>1</sup>, B. DENG<sup>1</sup>, J. GILBERT<sup>1</sup>, D. STELZNER<sup>2</sup>, J. CHAIKEN<sup>1</sup>, AND J. HASENINKEL<sup>1</sup><sup>1</sup>Syracuse University, Syracuse, NY, <sup>2</sup>Upstate Medical University, Syracuse, NY**PS-8B-12-155** Assessment of Strain Patterns in the Brain from Head Acceleration from Collegiate Football PlayersK. DANELSON<sup>1</sup>, S. ROWSON<sup>2</sup>, S. DUMA<sup>2</sup>, AND J. STITZEL<sup>1</sup><sup>1</sup>Virginia Tech/Wake Forest University SBES, Winston-Salem, NC, <sup>2</sup>Virginia Tech/Wake Forest University SBES, Blacksburg, VA**PS-8B-12-156** Neural Network Connectivity and Mapping of *In Vitro* CircuitsT. P. PATEL<sup>1</sup>, AND D. F. MEANEY<sup>1</sup><sup>1</sup>University of Pennsylvania, Philadelphia, PA**PS-8B-12-157** A Temporal Backpropagation Algorithm for the Resonate and Fire PerceptronH. MUKHOPADHY<sup>1</sup>, AND J. TRANQUILLO<sup>1</sup><sup>1</sup>Bucknell University, Lewisburg, PA**Track: New Frontiers in Bioengineering – PS-8B-13****Systems-Level Approaches in Bioengineering****PS-8B-13-158** Holding Strength of Suturing Techniques in Biological and Synthetic ModelsA. KUMAR<sup>1</sup><sup>1</sup>Ethicon inc, Somerville, NJ**PS-8B-13-159** Isolation and Culture of Contractile Myotubes from Insect Cells for Bioactuation ApplicationsA. L. BARYSHYAN<sup>1</sup>, B. A. TRIMMER<sup>1</sup>, AND D. L. KAPLAN<sup>1</sup><sup>1</sup>Tufts University, Medford, MA**PS-8B-13-160** A Spin Drying Technique for Dry Preservation of Mammalian CellsN. CHAKRABORTY<sup>1,2</sup>, M. A. MENZES<sup>3</sup>, S. C. HAND<sup>3</sup>, AND M. TONER<sup>1,2</sup><sup>1</sup>Center for Engineering in Medicine, Harvard Medical School, Boston, MA, <sup>2</sup>BioMEMS Resource Center, Massachusetts General Hospital, Charlestown, MA, <sup>3</sup>Louisiana State University, Baton Rouge, LA**PS-8B-13-161** EasyMed-ID: Private, Secure, and Memorable Identification of Medical Record Data for Mobile DevicesT. STOKES<sup>1</sup>, R. MOFFITT<sup>2</sup>, S. HANG<sup>3</sup>, C-W. CHENG<sup>3</sup>, AND M. WANG<sup>4</sup><sup>1</sup>Emory University - Georgia Tech, Atlanta, GA, <sup>2</sup>Georgia Tech - Emory University, Atlanta, GA, <sup>3</sup>Georgia Tech, Atlanta, GA, <sup>4</sup>Georgia Tech - Emory University, Atlanta, GA, Afghanistan**PS-8B-13-162** 24-Hour Core Temperature in Obese and Lean Men and WomenR. A. LINSENMEIER<sup>1</sup>, M. HOFFMANN<sup>1</sup>, S. RODRIGUEZ<sup>2</sup>, D. ZEISS<sup>2</sup>, R. KUSHNER<sup>2</sup>, AND L. LANDSBERG<sup>2</sup><sup>1</sup>Northwestern University, Evanston, IL, <sup>2</sup>Northwestern University, Chicago, IL**PS-8B-13-163** Synergistic Effects of Conditioned Media and Hydrostatic Pressure on Stem Cell DifferentiationS. MAXSON<sup>1</sup>, AND K. BURG<sup>1</sup><sup>1</sup>Clemson University, Clemson, SC**PS-8B-13-164** A Coupled Agents –Transport Modelling Approach for Bioreactor DesignH. KAUL<sup>1</sup>, D. J. HUGHES<sup>2</sup>, Z. CUI<sup>1</sup>, AND Y. VENTIKOS<sup>1</sup><sup>1</sup>University of Oxford, Oxford, United Kingdom, <sup>2</sup>Zyoxel Limited, Oxford, United Kingdom**PS-8B-13-165** Development of Solar Powered Transportable Mini-Lab for Field Disease DetectionE. RIOS<sup>1</sup>, R. ESPINOZA<sup>1</sup>, L. HOLGUIN<sup>1</sup>, D. TERREROS<sup>2</sup>, AND T. XU<sup>1,2</sup><sup>1</sup>University of Texas at El Paso, El Paso, TX, <sup>2</sup>Texas Tech University Health Sciences Center, El Paso, TX**Track: Orthopedic and Rehabilitation Engineering –PS-8B-14****Orthopaedic Soft Tissue Biomechanics****PS-8B-14-166** Testing-configuration and Lubricant Effects on Cartilage LubricationL. SHI<sup>1</sup>, AND A. STRIOLO<sup>1</sup><sup>1</sup>The University of Oklahoma, Norman, OK**PS-8B-14-167** Investigation of Biaxial Periosteal MechanicsO. O. ARUWAJOYE<sup>1</sup>, AND P. B. WELLS<sup>2</sup><sup>1</sup>Texas Scottish Rite Hospital, Dallas, TX, <sup>2</sup>Baylor University, Waco, TX**PS-8B-14-168** Biomechanical Analysis of the Rabbit Temporomandibular Joint FibrocartilagesA. J. ALMARZA<sup>1</sup>, AND S. E. HENDERSON<sup>1</sup><sup>1</sup>University of Pittsburgh, Pittsburgh, PA**PS-8B-14-169** Incomplete Fibers in Inner Annulus Affects Tissue Stresses Higher than in Outer or Middle AnnulusM. HUSSAIN<sup>1</sup>, R. E. GAY<sup>2</sup>, AND K-N. AN<sup>3</sup><sup>1</sup>Logan University, Chesterfield, MO, <sup>2</sup>Mayo Clinic, Rochester, MN, <sup>3</sup>Mayo Clinics, Rochester, MN**PS-8B-14-170** Disc with Incomplete Fibers Bulges More than the Disc with Complete Fibers: A Finite Element StudyM. HUSSAIN<sup>1</sup>, R. E. GAY<sup>2</sup>, AND K-N. AN<sup>3</sup><sup>1</sup>Logan University, Chesterfield, MO, <sup>2</sup>Mayo Clinic, Rochester, MN, <sup>3</sup>Mayo Clinics, Rochester, MN**PS-8B-14-171** Characterization of Synthetic Ballistic Gelatin as an Achievable Biological Tissue SimulantF. AMAECHI<sup>1</sup>, AND J. L. SPARKS<sup>2,3</sup><sup>1</sup>Wake Forest University School of Medicine, Winston Salem, <sup>27157</sup>, <sup>2</sup>Virginia Tech-Wake Forest Center for Injury Biomechanics, Winston Salem, <sup>27157</sup>, <sup>3</sup>Virginia Tech – Wake Forest University School of Biomedical Engineering and Sciences, Winston Salem, NC**PS-8B-14-172** Effect of Strain Rate and Soaking Time on the Mechanical Properties of Porcine Dermal CollagenS. SAHA<sup>1</sup>, T. THORNTON<sup>1</sup>, AND S. BATRA<sup>2</sup><sup>1</sup>SUNY Downstate Medical Center, Brooklyn, NY, <sup>2</sup>CollaFirm, LLC, Monmouth Junction, NJ

**PS-8B-14-173** The Effect of Radiation on Articular Cartilage Using a Murine Model

A. LINDBURG<sup>1</sup>, J. WILLEY<sup>1</sup>, T. BATEMAN<sup>1</sup>, AND D. DEAN<sup>1</sup>  
<sup>1</sup>Clemson University, Clemson, SC

**PS-8B-14-174** A Method for 3D Strain Field Measurement with Dynamic Tissue Deformation Using MR Imaging

P. J. BROWN<sup>1</sup>, H. TAN<sup>1</sup>, R. A. KRAFT<sup>1</sup>, AND J. D. STITZEL<sup>1</sup>  
<sup>1</sup>VT-WFU School of Biomedical Engineering and Sciences, Winston-Salem, NC

**PS-8B-14-175** The Dose Response of the Intervertebral Disc Neutral Zone Stability to Crosslinking with Genipin

B. KIRKING<sup>1,2</sup>, J. TOUNGATE<sup>2</sup>, AND T. HEDMAN<sup>1,2</sup>  
<sup>1</sup>Texas A&M University, College Station, TX, <sup>2</sup>Orthopeutics, Georgetown, TX

**PS-8B-14-176** Development of a Concussion Risk Curve Using Biomechanical Data from Collegiate Football Players

J. R. FUNK<sup>1</sup>, S. DUMA<sup>2</sup>, S. MANOOGIAN<sup>1</sup>, AND S. ROWSON<sup>2</sup>  
<sup>1</sup>Biodynamic Research Corporation, San Antonio, TX, <sup>2</sup>Virginia Tech, Blacksburg, VA

**PS-8B-14-177** Physiological Distributions Of Neuronal Strain In Peripheral Nerves

S. B. SHAH<sup>1</sup>, AND S. KRATOVAC<sup>1</sup>  
<sup>1</sup>University of Maryland, College Park, College Park, MD

**PS-8B-14-178** Effect of Shoe Laces on *In Situ* Measurement of Achilles Tendon Mechanics

S. ROWSON<sup>1</sup>, C. MCNALLY<sup>1</sup>, AND S. M. DUMA<sup>1</sup>  
<sup>1</sup>Virginia Tech, Blacksburg, VA

**PS-8B-14-179** On the Development of a Multilayered Finite Element Model of Scalp

S. RYLAND<sup>1</sup>  
<sup>1</sup>Mississippi State University, West Point, MS

**Track: Respiratory Engineering – PS-8B-15****Complexity and Heterogeneity in Lung Behavior****PS-8B-15-180** Impact of Mean Pressure vs. Dynamics during Breathing-Like Fluctuations on Intact Airway Responsiveness

B. C. HARVEY<sup>1</sup>, A. S. LAPRAD<sup>1</sup>, AND K. R. LUTCHEN<sup>1</sup>  
<sup>1</sup>Boston University, Boston, MA

**PS-8B-15-181** A Method for Assessing Glottis Aperture Variation on Airway Resistance by Forced Oscillation

Y. CHEN<sup>1,2</sup>, T. BRWON<sup>1</sup>, S. BHATAWADEKAR<sup>1</sup>, D. LEARY<sup>1</sup>, U. PETERS<sup>1</sup>, L. DENG<sup>2</sup>, AND G. MAKSYM<sup>1</sup>  
<sup>1</sup>Dalhousie University, Halifax, Nova Scotia, Canada, <sup>2</sup>Chongqing University, Chongqing, China, People's Republic of

**PS-8B-15-182** Effects of Airway Wall Thickness on Bronchoconstriction in Asthma

A. BRAUNE<sup>1</sup>, J. G. VENEGAS<sup>1</sup>, AND T. WINKLER<sup>1</sup>  
<sup>1</sup>Massachusetts General Hospital, Boston, MA

**PS-8B-15-183** Modeling Tissue Heterogeneity and Respiratory Impedance in Elastase Treated Mice

S. SATO<sup>1</sup>, A. MAJUMDAR<sup>1</sup>, AND B. SUKI<sup>1</sup>  
<sup>1</sup>Boston University, Boston, MA

**PS-8B-15-184** Computational Modeling of Airway Diameter Variation and Respiratory Impedance

D. LEARY<sup>1</sup>, G. PARRAGA<sup>2</sup>, AND G. N. MAKSYM<sup>1</sup>  
<sup>1</sup>Dalhousie University, Halifax, NS, Canada, <sup>2</sup>Robarts Research Institute, The University of Western Ontario, London, ON, Canada

**PS-8B-15-185** Relating Tree Structures to Parallel Pathways: Implications of Heterogeneous Disease on Distributed Airway Models

S. AMIN<sup>1</sup>, AND B. SUKI<sup>1</sup>  
<sup>1</sup>Boston University, Boston, MA

**PS-8B-15-186** Simulation of Dynamic Recruitment-Derecruitment in Mouse Lung under Deep Inflation

B. MA<sup>1</sup>, AND J. H. BATES<sup>1</sup>  
<sup>1</sup>University of Vermont, Burlington, VT

**Track: Systems Biology, Bioinformatics and Computational Biology – PS-8B-16****Biological Systems and Control Dynamics****PS-8B-16-187** Artificial Pancreas and Hypoglycemia Alarms for Patients with Type 1 Diabetes

M. ORUKLU<sup>1</sup>, L. QUINN<sup>2</sup>, D. K. ROLLINS<sup>3</sup>, AND A. CINAR<sup>1</sup>  
<sup>1</sup>Illinois Institute of Technology, Chicago, IL, <sup>2</sup>University of Illinois at Chicago, Chicago, IL, <sup>3</sup>Iowa State University, Ames, IA

**PS-8B-16-188** 3D Finite Element Modeling of Guinea Pig Middle Ear for Sound Transmission

X. GUAN<sup>1</sup>, AND R. GAN<sup>1</sup>  
<sup>1</sup>School of Aerospace & Mechanical Engineering and Bioengineering Center, University of Oklahoma, Norman, OK

**PS-8B-16-189** Model Analysis of Oxygen Transport and Metabolism in Contracting Muscle under Normoxia and Hypoxia

J. R. SPIRES<sup>1</sup>, N. LAI<sup>1</sup>, G. M. SAIDEL<sup>1</sup>, AND L. B. GLADDEN<sup>2</sup>  
<sup>1</sup>Case Western Reserve University, Cleveland, OH, <sup>2</sup>Auburn University, Auburn, AL

**PS-8B-16-190** MRI-Based Computational Models and Two-Compartment Models of Solid Tumors: Comparison of Predicted Tracer Distribution

G. L. PISHKO<sup>1</sup>, K. N. MAGDOOM MOHAMED<sup>1</sup>, G. W. ASTARY<sup>1</sup>, T. H. MARECI<sup>1</sup>, AND M. SARTINORANONT<sup>1</sup>  
<sup>1</sup>University of Florida, Gainesville, FL

**PS-8B-16-191** Inferring Cross-talk Among Interleukin-12, Interferon- and Tumor Necrosis Factor Signaling Pathways Within T Helper Cells

D. J. KLINKE<sup>1</sup>, E. CHAMBERS<sup>1</sup>, AND N. CHENG<sup>1</sup>  
<sup>1</sup>West Virginia University, Morgantown, WV

**PS-8B-16-192** Adaptive Control in Metabolic Pathway Regulation

C. F. QUO<sup>1</sup>, R. A. MOFFITT<sup>1</sup>, A. H. MERRILL<sup>1</sup>, AND M. D. WANG<sup>1</sup>  
<sup>1</sup>Georgia Institute of Technology, Atlanta, GA

**PS-8B-16-193** An Efficient Approach for the Combinatorial Quantitation and Control of Cellular Functions

I. AL-SHYOUKH<sup>1</sup>, F. YU<sup>1</sup>, J. FENG<sup>1</sup>, S. DUBINETT<sup>1</sup>, C-M. HO<sup>1</sup>, J. S. SHAMMA<sup>2</sup>, AND R. SUN<sup>1</sup>  
<sup>1</sup>University of California Los Angeles, Los Angeles, CA, <sup>2</sup>Georgia Institute of Technology, Atlanta, GA

**PS-8B-16-194** Mathematical Model Predicts Master-regulatory Role of Hematopoietic Stem Cell Network Module

J. NARULA<sup>1</sup>, AND O. A. IGOSHIN<sup>1</sup>  
<sup>1</sup>Rice University, Houston, TX

**PS-8B-16-195** Quantitative Modeling of Glabrous Skin Blood Flow

D. W. HENSLEY<sup>1</sup>, AND K. R. DILLER<sup>1</sup>  
<sup>1</sup>University of Texas at Austin, Austin, TX

**PS-8B-16-196** Multiplexed Media Delivery to Study Nutrient Adaptation in *C. elegans*

P. THOMAS<sup>1</sup>, A. PAZ<sup>1</sup>, O. CINQUIN<sup>1</sup>, AND E. HUI<sup>1</sup>  
<sup>1</sup>University of California at Irvine, Irvine, CA

**PS-8B-16-197** Modeling Inflammation with an Ensemble of Stochastic CellsJ. D. SCHEFF<sup>1</sup>, S. E. CALVANO<sup>2</sup>, S. F. LOWRY<sup>2</sup>, AND I. P. ANDROULAKIS<sup>1</sup><sup>1</sup>Rutgers University, Piscataway, NJ, <sup>2</sup>UMDNJ-Robert Wood Johnson Medical School, New Brunswick, NJ**PS-8B-16-198** Metrics for Systems Biology Model Building and ComparisonC. KADDI<sup>1</sup>, C. QUO<sup>1</sup>, AND M. D. WANG<sup>1,2</sup><sup>1</sup>Georgia Institute of Technology, Atlanta, GA, <sup>2</sup>Emory University, Atlanta, GA**PS-8B-16-199** A Mathematical Model of Random Behavior of Micro-Objects Propelled by Attached BacteriaM. A. TRAORE<sup>1</sup>, AND B. BEHKAM<sup>1</sup><sup>1</sup>Virginia Tech, Blacksburg, VA**PS-8B-16-200** Identification of Critical Network Interactions by Pathway-Centered Analysis of Microarray DataJ. HOOD<sup>1</sup>, AND R. R. VALLABHAJOSYULA<sup>1</sup><sup>1</sup>CFD Research Corp, Huntsville, AL**PS-8B-16-201** WebPK: A Web-Based Application for Custom Pharmacokinetic SimulationsJ. SRIMANI<sup>1</sup>, R. MOFFITT<sup>1</sup>, AND M. D. WANG<sup>1</sup><sup>1</sup>Georgia Institute of Technology, Atlanta, GA**Track: Tissue Engineering – PS-8B-17****Cardiovascular Tissue Engineering****PS-8B-16-202** Modeling *In Vivo* Metabolic Responses of Skeletal Muscle Fibers to ExerciseY. LI<sup>1</sup>, N. LAI<sup>1</sup>, J. KIRWAN<sup>2</sup>, AND S. GERALD<sup>1</sup><sup>1</sup>Case Western Reserve University, Cleveland, OH, <sup>2</sup>Cleveland Clinic, Cleveland, OH**PS-8B-17-203** Tailoring Electrospun Scaffolds for Use in Aortic Aneurysm RepairJ. MASSEY<sup>1,2</sup>, M. AGRAWAL<sup>1</sup>, AND S. BAILEY<sup>2</sup><sup>1</sup>University of Texas at San Antonio, San Antonio, TX, <sup>2</sup>University of Texas Health Science Center at San Antonio, San Antonio, TX**PS-8B-17-204** Development of a Slowly Degradable Microfabricated Perfusion Systems for Vascularized TissuesL. S. WRAY<sup>1</sup>, AND D. L. KAPLAN<sup>1</sup><sup>1</sup>Tufts University, Medford, MA**PS-8B-17-205** Protein Solubilization for Antigen Removal from Bovine Pericardium in Heart Valve Tissue EngineeringM. L. WONG<sup>1</sup>, AND L. G. GRIFFITHS<sup>1</sup><sup>1</sup>University of California, Davis, Davis, CA**PS-8B-17-206** Three Dimensionally Flocculated Proangiogenic Microgels for NeovascularizationR. J. DEVOLDER<sup>1</sup>, AND H. KONG<sup>1</sup><sup>1</sup>University of Illinois, Urbana, IL**PS-8B-17-207** Normalization of Microvascular Physiology by Cyclic AMP in Engineered Human Blood MicrovesselsK. WONG<sup>1</sup>, J. TRUSLOW<sup>1</sup>, AND J. TIEN<sup>1</sup><sup>1</sup>Boston University, Boston, MA**PS-8B-17-208** The Controlled Release of Neuropeptide Induces AngiogenesisH. KOHARA<sup>1</sup>, M. YAMAMOTO<sup>1</sup>, AND Y. TABATA<sup>1</sup><sup>1</sup>Institute for Frontier Medical Sciences, Kyoto University, Kyoto, Kyoto, Japan**PS-8B-17-209** Engineering Functional Human Microvessels *In Vitro*J. TIEN<sup>1</sup><sup>1</sup>Boston University, Boston, MA**PS-8B-17-210** Hair Follicle Derived Mesenchymal Stem Cells for Engineering Arterial SubstitutesH. PENG<sup>1</sup>, E. SCHLAICH<sup>1</sup>, D. D. SWARTZ<sup>1</sup>, AND S. T. ANDREADIS<sup>1,2</sup><sup>1</sup>University at Buffalo, Buffalo, NY, <sup>2</sup>New York State Center of Excellence, Buffalo, NY**PS-8B-17-211** Development of Bioactive Nanofibrous Vascular Grafts with *In-Vivo* Endothelialization PotentialJ. HENRY<sup>1</sup>, AND S. LI<sup>1</sup><sup>1</sup>University of California - Berkeley, Berkeley, CA**PS-8B-17-212** Vascular Cell Morphology on Aligned Collagen MatricesN. F. HUANG<sup>1</sup>, T. S. ZAITSEVA<sup>2</sup>, M. PAUKSHTO<sup>2</sup>, J. SUN<sup>1</sup>, G. G. FULLER<sup>1</sup>, AND J. P. COOKE<sup>1</sup><sup>1</sup>Stanford University, Stanford, CA, <sup>2</sup>Fibralign Corp., Sunnyvale, CA**PS-8B-17-213** Reinforcing PEG Hydrogels with an Electrospun Mesh Sleeve to Form a Multilayer TEVGM. B. BROWNING<sup>1</sup>, D. K. DEMPSEY<sup>1</sup>, AND E. M. COSGRIFF-HERNANDEZ<sup>1</sup><sup>1</sup>Texas A&M University, College Station, TX**PS-8B-17-214** Molecular Modulation of Endothelial Cell Adhesion for Vascular Tissue EngineeringB. J. TEFFT<sup>1</sup>, A. M. KOPACZ<sup>1</sup>, W. K. LIU<sup>1</sup>, AND S. Q. LIU<sup>1</sup><sup>1</sup>Northwestern University, Evanston, IL**PS-8B-17-215** *In Vitro* Biodegradation of a Novel Bioresorbable Poly(ester urethane)D. K. DEMPSEY<sup>1</sup>, A. F. HAQUE<sup>1</sup>, R. S. WARD<sup>2</sup>, A. V. IYER<sup>2</sup>, J. P. PARAKKA<sup>2</sup>, AND E. M. COSGRIFF-HERNANDEZ<sup>1</sup><sup>1</sup>Texas A&M University, College Station, TX, <sup>2</sup>DSM-PTG, Berkeley, CA**PS-8B-17-216** Crosslinked Urethane-doped Polyester Triphasic Scaffold for Vascular Tissue EngineeringI. QATTAN<sup>1</sup>, R. T. TRAN<sup>1</sup>, AND J. YANG<sup>1</sup><sup>1</sup>The University of Texas at Arlington, Arlington, TX**PS-8B-17-217** Mitral Valve Geometry Difference Between Ischemic and Dilated Condition During SystoleB. GAO<sup>1</sup>, AND Z. HE<sup>1</sup><sup>1</sup>Texas Tech Univ., Lubbock, TX**PS-8B-17-218** Can Matrix Degrading Enzymes Improve Remodeling *In Vitro*? Pepsin Degradation of a SIS Cardiac PatchB. B. SCULLY<sup>1,2</sup>, D. L. MORALES<sup>2,3</sup>, J. E. BARZILLA<sup>1</sup>, AND K. J. GRANDE-ALLEN<sup>1</sup><sup>1</sup>Rice University, Houston, TX, <sup>2</sup>Baylor College of Medicine, Houston, TX, <sup>3</sup>Texas Children's Hospital, Houston, TX**PS-8B-17-219** Dextran Stabilizes Engineered Human Microvessels *In Vitro*A. D. LEUNG<sup>1</sup>, K. H. WONG<sup>1</sup>, AND J. TIEN<sup>1</sup><sup>1</sup>Boston University, Boston, MA**PS-8B-17-220** Enhanced Endothelialization Using EPC Autoseeding on POC/PLGA Microparticle CompositeH. XU<sup>1</sup>, AND K. T. NGUYEN<sup>1</sup><sup>1</sup>University of Texas at Arlington, Arlington, TX**PS-8B-17-221** Tailoring *In Vivo* Vascular Morphology with Bioactive Poly(ethylene glycol) HydrogelsJ. E. SAIK<sup>1</sup>, D. J. GOULD<sup>1,2</sup>, M. E. DICKINSON<sup>2</sup>, AND J. L. WEST<sup>1</sup><sup>1</sup>Rice University, Houston, TX, <sup>2</sup>Baylor College of Medicine, Houston, TX**PS-8B-17-222** Methodology for the Fabrication of Cell Based Cardiac PumpsR. EVERS<sup>1</sup>, AND R. BIRLA<sup>1</sup><sup>1</sup>University of Michigan, Ann Arbor, MI**PS-8B-17-223** Cellular Assembly by Centrifugal Force to Form Tubular Tissue ConstructsC. JONES<sup>1</sup>, E. J. BURFORD<sup>1</sup>, L. SODERBOM<sup>1</sup>, P. SULLIVAN<sup>1</sup>, AND M. W. ROLLE<sup>1</sup><sup>1</sup>Worcester Polytechnic Institute, Worcester, MA

**PS-8B-17-224** A Porous Nylon Anchor System for Improved Culture of Cell-Derived Tissue TubesA. Z. REIDINGER<sup>1</sup>, A. ORTIZ<sup>1</sup>, AND M. W. ROLLE<sup>1</sup>  
<sup>1</sup>Worcester Polytechnic Institute, Worcester, MA**PS-8B-17-225** Development of the Human Umbilical Artery as a 3D Scaffold for Vascular ReconstructionM. RODRIGUEZ<sup>1</sup>, M. MCCLENDON<sup>1</sup>, AND P. MCFETRIDGE<sup>2</sup>  
<sup>1</sup>University of Oklahoma, Norman, OK, <sup>2</sup>University of Florida, Gainesville, FL**PS-8B-17-226** Multi-functional Nanofiber Patch to Tune Embryonic Stem Cell Delivery Onto Hypertrophic MyocardiumM. K. GUPTA<sup>1</sup>, D. K. JUNG<sup>1</sup>, A. K. HATZOPOULOS<sup>2</sup>, AND H. J. SUNG<sup>1</sup>  
<sup>1</sup>Vanderbilt University, Nashville, TN, <sup>2</sup>Vanderbilt University Medical Center, Nashville, TN**PS-8B-17-227** Cell-Derived Ring Fusion to Generate Tubular Tissue ConstructsT. GWYTHYER<sup>1</sup>, AND M. W. ROLLE<sup>1</sup>  
<sup>1</sup>Worcester Polytechnic Institute, Worcester, MA**PS-8B-17-228** CANCELED**PS-8B-17-229** Development and Characterization of a Novel Bi-Layered Tissue Engineered Vascular GraftJ. D. BANIK<sup>1</sup>, AND J. A. COOPER<sup>1</sup>  
<sup>1</sup>Rensselaer Polytechnic Institute, Troy, NY**PS-8B-17-230** Control of Tissue Engineered Cardiac Muscle Fibrosis by an Endocardial SurrogateA. PARKAR<sup>1</sup>, N. MASOUMI<sup>1</sup>, A. JEAN<sup>1</sup>, AND G. C. ENGELMAYR<sup>1</sup>  
<sup>1</sup>The Pennsylvania State University, University Park, PA**PS-8B-17-231** Tailoring Electrospinning Fabrication for Scaffolds for Heart Valve Tissue EngineeringN. J. AMOROSO<sup>1,2</sup>, A. D'AMORE<sup>1,3</sup>, W. R. WAGNER<sup>1,2</sup>, AND M. S. SACKS<sup>1,2</sup>  
<sup>1</sup>University of Pittsburgh, Pittsburgh, PA, <sup>2</sup>McGowan Institute for Regenerative Medicine, Pittsburgh, PA, <sup>3</sup>University of Palermo, Palermo, Sicily, Italy**PS-8B-17-232** Macrophage Interactions with Decellularized Materials: Influence of Crosslinking TreatmentJ. MCDADE<sup>1</sup>, M. ARIGANELLO<sup>1</sup>, E. BRENNAN<sup>1</sup>, R. LABOW<sup>2</sup>, AND M. LEE<sup>1</sup>  
<sup>1</sup>Dalhousie University, Halifax, NS, Canada, <sup>2</sup>Ottawa Heart Institute, Ottawa, ON, Canada**PS-8B-17-233** A Hybrid, Tissue Engineered Leaflet for Bioprosthetic Heart ValvesH. ALAVI<sup>1</sup>, R. L. GOODWIN<sup>1</sup>, AND A. KHERADVAR<sup>1</sup>  
<sup>1</sup>University of South Carolina, Columbia, SC**Track: Tissue Engineering - PS-8B-18****Cell-Biomaterial Interfaces****PS-8B-18-234** Protein Transport and Stability: Considerations for Cell EncapsulationW. L. STOPPEL<sup>1</sup>, J. C. WHITE<sup>1</sup>, S. R. BHATIA<sup>1</sup>, AND S. C. ROBERTS<sup>1</sup>  
<sup>1</sup>University of Massachusetts Amherst, Amherst, MA**PS-8B-18-235** Canceled**PS-8B-18-236** Investigating Schwann Cell Response on Polypyrrole Substrates Upon Electrical StimulationL. FORCINITI<sup>1</sup>, J. F. YBARRA<sup>1</sup>, J. MALDONADO<sup>1</sup>, AND C. E. SCHMIDT<sup>1</sup>  
<sup>1</sup>University of Texas at Austin, Austin, TX**PS-8B-18-237** Stiffness of the Substrate Influences the Phenotype of Embryonic Chicken Cardiac MyocytesP. BAJAJ<sup>1</sup>, X. TANG<sup>1</sup>, T. SAIF<sup>1</sup>, AND R. BASHIR<sup>1</sup>  
<sup>1</sup>University of Illinois Urbana Champaign, Urbana, IL**PS-8B-18-238** Microtube Device Functionalized with Selectins for Capture and Study of Circulating Tumor CellsA. D. HUGHES<sup>1</sup>, L. T. WESTERN<sup>2</sup>, J. C. MATTISON<sup>1</sup>, B. GREENE<sup>3</sup>, AND M. R. KING<sup>1</sup>  
<sup>1</sup>Cornell University, Ithaca, NY, <sup>2</sup>Rochester University, Rochester, NY, <sup>3</sup>Biocytics Inc., Huntersville, NC**PS-8B-18-239** How Does ECM Fiber Stress State Affect Cell Behavior?M. A. KOTLARCHYK<sup>1</sup>, S. SHREIM<sup>1</sup>, E. KNIAZEVA<sup>1</sup>, M. ALVAREZ-ELIZONDO<sup>1</sup>, A. PUTNAM<sup>1,2</sup>, AND E. BOTVINICK<sup>1</sup>  
<sup>1</sup>UC Irvine, Irvine, CA, <sup>2</sup>University of Michigan, Ann Arbor, MI**PS-8B-18-240** Harnessing Matrix Interface to Control Stem Cell DifferentiationR. AYALA<sup>1</sup>, C. ZHANG<sup>1</sup>, A. AUNG<sup>1</sup>, Y. HWANG<sup>1</sup>, AND S. VARGHESE<sup>1</sup>  
<sup>1</sup>UC San Diego, La Jolla, CA**PS-8B-18-241** Designing Biomaterial Surfaces to Enhance Keratinocyte Adhesion at the Skin-Implant InterfaceC. M. TING<sup>1</sup>, A. M. KHAING<sup>1</sup>, W. G. MCGIMPSEY<sup>1</sup>, AND G. D. PINS<sup>1</sup>  
<sup>1</sup>Worcester Polytechnic Institute, Worcester, MA**PS-8B-18-242** Effects of Synthetic Biogel Scaffold Properties in Angiogenesis, Modeling with Agent Based SystemsA. ARTEL<sup>1</sup>, H. MEHDIZADEH<sup>1</sup>, E. BREY<sup>1</sup>, AND A. CINAR<sup>1</sup>  
<sup>1</sup>Illinois Institute of Technology, Chicago, IL**PS-8B-18-243** Development Of Biomimetic Materials For Guided Endothelial Cell Morphogenesis, and OrganizationA. PORTER<sup>1</sup>, Y. YUAN<sup>1</sup>, C. M. KLINGE<sup>1</sup>, AND A. S. GOBIN<sup>1</sup>  
<sup>1</sup>University of Louisville, Louisville, KY**PS-8B-18-244** Dynamic Bioactive Surfaces for Temporal Regulation of Extracellular MicroenvironmentsB. LIU<sup>1</sup>, AND W. SHEN<sup>1</sup>  
<sup>1</sup>University of Minnesota, Minneapolis, MN**PS-8B-18-245** Electrical Control of Cell Migration on a Conducting Polymer SurfaceA. GUMUS<sup>1</sup>, J. CALIFANO<sup>1</sup>, A. WAN<sup>1</sup>, J. HUYNH<sup>1</sup>, C. REINHART-KING<sup>1</sup>, AND G. MALLIARAS<sup>1</sup>  
<sup>1</sup>Cornell University, Ithaca, NY**PS-8B-18-246** Microcracking and Maturation of MC3T3-E1 Osteoblast BehaviorY. SHU<sup>1</sup>, M. BAUMANN<sup>1</sup>, L. MCCABE<sup>1</sup>, E. CASE<sup>1</sup>, AND R. IRWIN<sup>1</sup>  
<sup>1</sup>Michigan State University, East Lansing, MI**PS-8B-18-247** Tryptophan: An Intrinsic Fluororeporter for Peptide Functionalized BiomaterialsS. N. MASAND<sup>1</sup>, A. BLAZIER<sup>2</sup>, C. BRADLEY<sup>1</sup>, AND D. SHREIBER<sup>1</sup>  
<sup>1</sup>Rutgers, The State University of New Jersey, Piscataway, NJ, <sup>2</sup>University of Virginia, Charlottesville, VA**PS-8B-18-248** Pro- and Anti-Oxidative Biomaterial Surfaces to Modulate Stem Cell FateS. W. CROWDER<sup>1</sup>, A. L. ZACHMAN<sup>1</sup>, M. K. GUPTA<sup>1</sup>, E. LIU<sup>2</sup>, J. B. KOHN<sup>2</sup>, P. V. MOGHE<sup>2</sup>, AND H.-J. SUNG<sup>1</sup>  
<sup>1</sup>Vanderbilt University, Nashville, TN, <sup>2</sup>Rutgers University, Piscataway, NJ**PS-8B-18-249** Cell Interactions in Biomimetic Apatite MicroenvironmentE. TSANG<sup>1</sup>, C. ARAKAWA<sup>1</sup>, P. ZUK<sup>2</sup>, AND B. WU<sup>1</sup>  
<sup>1</sup>Dept of Bioengineering, UCLA, Los Angeles, CA, <sup>2</sup>Dept of Surgery, David Geffen School of Medicine, UCLA, Los Angeles, CA

**Track:Tissue Engineering – PS-8B-19****Controlled Release in Tissue Engineering\*****PS-8B-19-250** Effect of Protein Molecular Weight on Release From Wet Spun PLGA and PLLA Fibers by Phase-inversionD. M. DECOTEAU<sup>1</sup>, L. ZHANG<sup>1</sup>, R. M. STEFANI<sup>1</sup>, R. A. HOPKINS<sup>2</sup>, AND E. MATHIOWITZ<sup>1</sup>  
<sup>1</sup>Brown University, Providence, RI, <sup>2</sup>The Children's Mercy Hospital, Kansas City, MO**PS-8B-19-251** Nitric Oxide Releasing Polymers as Bone Metabolism Support in Tissue Engineering ScaffoldsJ. FORREST<sup>1</sup>, G. E. GIERKE<sup>1</sup>, M. J. VANWAGNER<sup>1</sup>, K. L. SNYDER<sup>1</sup>, M. C. FROST<sup>1</sup>, AND R. M. RAJACHAR<sup>1</sup><sup>1</sup>Michigan Technological University, Houghton, MI**PS-8B-19-252** Multiple Drug Delivery System Based on CAP-Pluronic Association PolymerS. SUNDARARAJ<sup>1</sup>, D. PULEO<sup>1</sup>, AND M. THOMAS<sup>1</sup><sup>1</sup>University of Kentucky, Lexington, KY**PS-8B-19-253** Preparation and Characterization of NSAID-embedded Nanofiber Matrix for Drug DeliveryP. SAMUEL<sup>1</sup>, AND J. A. COOPER<sup>1</sup><sup>1</sup>Rensselaer Polytechnic Institute, Troy, NY**Track:Tissue Engineering – PS-8B-20****Nano- and Micro- Engineering in Tissue Engineering\*****PS-8B-20-254** Micromilling for Fabricating Biologically Inspired Microfluidic Channels for Regenerative MedicineM. E. WILSON<sup>1</sup>, N. KOTA<sup>1</sup>, Y. KIM<sup>1</sup>, D. B. STOLZ<sup>2</sup>, Y. WANG<sup>2</sup>, O. B. OZDOGANLAR<sup>1</sup>, AND P. R. LEDUC<sup>1</sup><sup>1</sup>Carnegie Mellon University, Pittsburgh, PA, <sup>2</sup>University of Pittsburgh, Pittsburgh, PA**PS-8B-20-255** High-Speed Biaxial Tissue Testing of Abdominal VisceraN. A. WHITE<sup>1</sup>, M. K. HOWES<sup>1</sup>, AND W. N. HARDY<sup>1</sup><sup>1</sup>Virginia Tech, Blacksburg, VA**PS-8B-20-256** Temperature-controlled Harvesting of Cell AggregatesH. TEKIN<sup>1,2</sup>, C. NAUMAN<sup>2,3</sup>, M. ANAYA<sup>2,4</sup>, R. LANGER<sup>4,5</sup>, AND A. KHADEMHOSEINI<sup>2,5</sup><sup>1</sup>Department of Electrical Engineering and Computer Science, Massachusetts Institute of Technology, Cambridge, MA, <sup>2</sup>Center for Biomedical Engineering, Brigham and Women's Hospital, Harvard Medical School, Cambridge, MA, <sup>3</sup>Department of Biology, Massachusetts Institute of Technology, Cambridge, MA, <sup>4</sup>Department Chemical Engineering, Massachusetts Institute of Technology, Cambridge, MA, <sup>5</sup>Harvard-MIT Division of Health Sciences and Technology, Massachusetts Institute of Technology, Cambridge, MA**PS-8B-20-257** Directed Cellular Invasion and Angiogenesis in Micropatterned Collagen ScaffoldsY. ZHENG<sup>1</sup>, P. W. HENDERSON<sup>2</sup>, N. W. CHOI<sup>1</sup>, L. J. BONASSAR<sup>1</sup>, J. A. SPECTOR<sup>2</sup>, AND A. D. STROOCK<sup>1</sup><sup>1</sup>Cornell University, Ithaca, NY, <sup>2</sup>Weill Cornell Medical College, New York, NY**PS-8B-20-258** Isolation and Purification of Novel Organic Nanoparticles from English Ivy (*Hedera helix*)S. LENAGHAN<sup>1</sup>, L. XIA<sup>1</sup>, W. HENSON<sup>1</sup>, AND M. ZHANG<sup>1</sup><sup>1</sup>University of Tennessee, Knoxville, TN**PS-8B-20-259** A Microstructure Based Mechanical Model for Planar Fibrous ScaffoldsA. D'AMORE<sup>1,2</sup>, C. M. HOBSON<sup>1</sup>, W. R. WAGNER<sup>1</sup>, AND M. S. SACKS<sup>1</sup><sup>1</sup>University of Pittsburgh, Pittsburgh, PA, <sup>2</sup>University of Palermo, Palermo, Italy, Italy**PS-8B-20-260** Engineering Optimal Islets for Transplantation for Type I DiabetesK. RAMACHANDRAN<sup>1</sup>, S. J. WILLIAMS<sup>1</sup>, H-H. HUANG<sup>1</sup>, C. BERKLAND<sup>2</sup>, AND L. STEHNO-BITTEL<sup>1</sup><sup>1</sup>University of Kansas Medical Center, Kansas City, KS, <sup>2</sup>University of Kansas, Lawrence, KS**PS-8B-20-261** Tri-functional Nanoporous Silica Nanoparticles for Imaging, Delivery and Biomaterial ReinforcementC. SMID<sup>1</sup><sup>1</sup>University of Texas at Austin/ University of Texas Health Science Center, Houston, TX**PS-8B-20-262** Biomechanical Response of Human Spleen Parenchyma in Tensile LoadingA. R. KEMPER<sup>1</sup>, A. SANTAGO<sup>1</sup>, J. STITZEL<sup>1</sup>, J. SPARKS<sup>1</sup>, AND S. DUMA<sup>1</sup><sup>1</sup>Virginia Tech - Wake Forest University, Center for Injury Biomechanics, Blacksburg, VA**PS-8B-20-263** Multi-Compartment Platform for Organotypic Spinal Cord Cultures to Study Axonal Synaptic TargetingD. G. CASTILLO<sup>1</sup>, AND S. N. HOSMANE<sup>1</sup><sup>1</sup>Johns Hopkins University, Baltimore, MD**PS-8B-20-264** Nano-Patterned Surfaces Induce Elastin Expression from Valvular Interstitial CellsE. L. HEDBERG-DIRK<sup>1</sup>, U. A. MARTINEZ<sup>1</sup>, AND A. E. HELLEBUST<sup>1</sup><sup>1</sup>University of New Mexico, Albuquerque, NM**PS-8B-20-265** Characterization of Small Diameter *In Vitro* Endothelial Linings of the MicrovasculatureM. B. ESCH<sup>1</sup>, M. L. SHULER<sup>1</sup>, AND T. STOKOL<sup>1</sup><sup>1</sup>Cornell University, Ithaca, NY**PS-8B-20-266** Photopatterning of Cell-laden PEGDA Hydrogel Microstructures Using Mask Projection PhotolithographyS. J. HIGBEE<sup>1</sup>, M. P. CUCHIARA<sup>1</sup>, AND J. L. WEST<sup>1</sup><sup>1</sup>Rice University, Houston, TX**PS-8B-20-267** Step Based Isodiametric Design Space for Aligned Deposition of Polymer Nanofibers in Multiple LayersJ. WANG<sup>1</sup>, AND A. S. NAIN<sup>1</sup><sup>1</sup>Virginia Tech, Blacksburg, VA**PS-8B-20-268** Dynamic Material Properties of Pregnant Human UterusS. DUMA<sup>1</sup>, S. MANOOGIAN<sup>1</sup>, J. BISPLINGHOFF<sup>1</sup>, AND J. STITZEL<sup>1</sup><sup>1</sup>Virginia Tech - Wake Forest University, Center for Injury Biomechanics, Blacksburg, VA**PS-8B-20-269** Transplantation of Two Derived hESC Populations in a Novel Biomimetic ArchitectureW. TURNER<sup>1</sup>, J. LUNA<sup>1</sup>, M. KHINE<sup>2</sup>, AND K. MCCLOSKEY<sup>1</sup><sup>1</sup>University of California - Merced, Merced, CA, <sup>2</sup>University of California - Irvine, Irvine, CA**PS-8B-20-270** Patented Electrospinning Process (EsNT) for NanoMedicineG-M. KIM<sup>1</sup>, J. D. SALAZAR<sup>1</sup>, L. MUERZA-CASCANTE<sup>1</sup>, A. ELÓSEGUI<sup>1</sup>, AND E. DE JUAN-PARDO<sup>1</sup><sup>1</sup>CEIT and TECNUN (University of Navarra), San Sebastián, Guipuzcoa, Spain**Track:Tissue Engineering – PS-8B-21****Printing and Patterning in Tissue Engineering****PS-8B-21-271** Patterned Silk Film Scaffolds for Lamellar Bone Tissue EngineeringL. W. TIEN<sup>1</sup>, E. S. GIL<sup>1</sup>, S. H. PARK<sup>1</sup>, B. B. MANDAL<sup>1</sup>, AND D. L. KAPLAN<sup>1</sup><sup>1</sup>Tufts University, Medford, MA**PS-8B-21-272** Patterning of Poly-Caprolactone (PCL) Nanofibers using Near Field ElectrospinningB. STARLY<sup>1</sup>, AND S-F. LAN<sup>1</sup><sup>1</sup>University of Oklahoma, Norman, OK**PS-8B-21-273** Anatomically Precise 3D Printing for Engineering Spatially Heterogeneous Living Heart ValvesL. A. HOCKADAY<sup>1</sup>, K. H. KANG<sup>1</sup>, N. W. COLANGELO<sup>1</sup>, P. Y-C. CHEUNG<sup>1</sup>, J. WU<sup>1</sup>, H. LIPSON<sup>1</sup>, C-C. CHU<sup>1</sup>, AND J. T. BUTCHER<sup>1</sup><sup>1</sup>Cornell University, Ithaca, NY

**PS-8B-21-274** Microfluidics in Hydrogels Using a Sealing Adhesion LayerL. M. BELLAN<sup>1</sup>, D. WU<sup>1</sup>, J. T. BORENSTEIN<sup>2</sup>, D. M. CROPEK<sup>3</sup>, AND R. LANGER<sup>1</sup>  
<sup>1</sup>MIT, Cambridge, MA, <sup>2</sup>Draper Laboratory, Cambridge, MA, <sup>3</sup>ERDC-CERL, Champaign, IL**PS-8B-21-275** Surface Immobilization of Adeno-Associated Virus for Localized Gene DeliveryK. I. MCCONNELL<sup>1</sup>, J. H. SLATER<sup>1</sup>, R. W. ADAMS<sup>1</sup>, J. L. WEST<sup>1</sup>, S. L. BISWAL<sup>1</sup>, AND J. SUH<sup>1</sup>  
<sup>1</sup>Rice University, Houston, TX**PS-8B-21-276** Vasculature Patterning within Hydrogel using Three-Dimensional Bio-Printing TechnologyV. K. LEE<sup>1</sup>, W. LEE<sup>2</sup>, S-S. YOO<sup>3</sup>, AND G. DAI<sup>1</sup>  
<sup>1</sup>RPI, Troy, NY, <sup>2</sup>KAIST, Daejeon, Korea, Republic of, <sup>3</sup>Brigham and Women's Hospital, Harvard Medical School, Boston, MA**PS-8B-21-277** Ultra-high Density Oligonucleotide Arrays for Ordered, Pinpoint Cell Assembly in Tissue Engineered StructuresU. VERMESH<sup>1</sup>, AND O. VERMESH<sup>1,2</sup>  
<sup>1</sup>California Institute of Technology, Pasadena, CA, <sup>2</sup>The David Geffen School of Medicine at UCLA, Los Angeles, CA**PS-8B-21-278** Hydrogel Tubular Constructs Formed Via a Multiphase Co-axial FlowM. HU<sup>1</sup>, R. DENG<sup>1</sup>, L. WANG<sup>1</sup>, M. KURISAWA<sup>1</sup>, AND J. YING<sup>1</sup>  
<sup>1</sup>Institute of Bioengineering and Nanotechnology, The Nanos, Singapore**PS-8B-21-279** Development of Miniature Drug Screening Platform Utilizing Low Cost Bioprinting TechnologyJ. I. RODRIGUEZ<sup>1</sup>, D. REYNA<sup>1</sup>, AND T. XU<sup>1,2</sup>  
<sup>1</sup>University of Texas at El Paso, El Paso, TX, <sup>2</sup>Texas Tech University Health Sciences Center, El Paso, TX**PS-8B-21-280** Hierarchical Silk Laminates for Tissue FormationB. B. MANDAL<sup>1</sup>, AND D. L. KAPLAN<sup>1</sup>  
<sup>1</sup>Tufts University, Medford, MA**PS-8B-21-281** Spatial Control of Cell Differentiation Fate Using Oriented Sub-micron Fibers and Bioprinted Growth FactorsD. KER<sup>1</sup>, A. NAIN<sup>2</sup>, J. SUHAN<sup>1</sup>, B. CHU<sup>1</sup>, L. WEISS<sup>1</sup>, AND P. CAMPBELL<sup>1</sup>  
<sup>1</sup>Carnegie Mellon University, Pittsburgh, PA, <sup>2</sup>Virginia Tech, Blacksburg, VA**PS-8B-21-282** HUVEC Networks Printed to Stackable PLGA/Hydrogel 'Biopapers' via BioLPR. K. PIRLO<sup>1</sup>, P. K-C. WU<sup>2</sup>, AND B. RINGEISEN<sup>1</sup>  
<sup>1</sup>Naval Research Laboratory, Washington, DC, <sup>2</sup>Southern Oregon University, Ashland, OR**PS-8B-21-283** Non-Contact Printing of High-Fidelity Heterocellular Niches Using Aqueous Biphasic SystemsH. TAVANA<sup>1</sup>, AND S. TAKAYAMA<sup>1</sup>  
<sup>1</sup>University of Michigan, Ann Arbor, MI**PS-8B-21-284** Three-Dimensional (3D) Stereo-Lithographic Technology for Bio-inspired Multi-Cellular StructuresV. CHAN<sup>1</sup>, P. ZORLUTUNA<sup>1</sup>, J. JEONG<sup>1</sup>, H. KONG<sup>1</sup>, AND R. BASHIR<sup>1</sup>  
<sup>1</sup>University of Illinois, Urbana-Champaign, Urbana, IL**PS-8B-21-285** High Throughput Miniaturization of Artificial Cells Using Inkjet TechnologyM. MOBED-MIREMADI<sup>1</sup>, E. ACKS<sup>1</sup>, S. POLSAWARD<sup>1</sup>, AND D. CHEN<sup>1</sup>  
<sup>1</sup>San Jose State University, San Jose, CA**PS-8B-21-286** Topographic and Chemically Micropatterned Polyacrylamide Cell SubstratesM. J. POELLMANN<sup>1</sup>, P. A. HARRELL<sup>1</sup>, S. MISHRA<sup>1</sup>, K. A. BARTON<sup>1</sup>, W. P. KING<sup>1</sup>, AND A. J. WAGONER JOHNSON<sup>1</sup>  
<sup>1</sup>University of Illinois at Urbana Champaign, Urbana, IL**PS-8B-21-287** Micropatterning and Printing of Functional Microscale Tissue Subunits on Nanofibrous ScaffoldsD. GALLEGOS-PEREZ<sup>1</sup>, N. HIGUITA-CASTRO<sup>1</sup>, J. LANNUTTI<sup>1</sup>, K. GOOCH<sup>1</sup>, AND D. HANSFORD<sup>1</sup>  
<sup>1</sup>The Ohio State University, Columbus, OH**PS-8B-21-288** Improving Cell Viability Using Bio-printed Oxygen Particles for Tissue Engineering ApplicationA. ARTEAGA<sup>1</sup>, AND T. XU<sup>1,2</sup>  
<sup>1</sup>University of Texas at El Paso, El Paso, TX, <sup>2</sup>Texas Tech University Health Sciences Center, El Paso, TX

**Track: Translational Biomedical Engineering – 8-2-1****Translational Biomedical Engineering****Chairs:** Daniel G. Anderson, PhD

Room 12A

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

INVITED SPEAKER: JOACHIM KOHN

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

INVITED SPEAKER: ART COURY

**2:30PM OP-8-2-1C** - Peripheral Nerve Regeneration Using Keratin Biomaterials: From Bench to BedsideL. PACE<sup>1</sup>, J. BARNWELL<sup>1</sup>, Z. LI<sup>1</sup>, L. A. KOMAN<sup>1</sup>, T. A. SMITH<sup>1</sup>, AND M. VAN DYKE<sup>1</sup><sup>1</sup>Wake Forest University School of Medicine, Winston Salem, NC**2:45PM OP-8-2-1D** Commercializing the Avance<sup>®</sup> Nerve GraftC. DEISTER<sup>1</sup><sup>1</sup>AxoGen, Inc, Alachua, FL**Track: Biomedical Imaging and Optics – 8-2-2****Imaging in Therapeutics – II****Chairs:** Stanislav Emelianov, Katherine Ferrara

Room 12B

**1:30PM OP-8-2-2A** Integrated Rational Design of Nanoparticle Systems for Biomedical ApplicationsA. L. VAN DE VEN<sup>1</sup>, S. LEE<sup>2</sup>, P. KIM<sup>3</sup>, O. HALEY<sup>3</sup>, S-H. YUN<sup>3</sup>, M. FERRARI<sup>1</sup>, AND P. DECUZZI<sup>1</sup><sup>1</sup>University of Texas Health Science Center, Houston, TX, <sup>2</sup>University of Texas, Austin, TX, <sup>3</sup>Harvard Medical School, Boston, MA**1:45PM OP-8-2-2B** Targeted Microwave Hyperthermia Using Magnetite NanoparticlesJ. R. COOK<sup>1</sup>, S. KIM<sup>1</sup>, J. A. PEARCE<sup>1</sup>, AND S. Y. EMELIANOV<sup>1</sup><sup>1</sup>University of Texas at Austin, Austin, TX**2:00PM OP-8-2-2C** Methods for Creating Carbon Nanohorn-Quantum Dot Conjugates and an Investigation of Cellular UptakeK. A. ZIMMERMANN<sup>1</sup>, J. ZHANG<sup>1</sup>, H. DORN<sup>1</sup>, C. G. RYLANDER<sup>1</sup>, AND M. N. RYLANDER<sup>1</sup><sup>1</sup>Virginia Polytechnic Institute and State University, Blacksburg, VA**2:15PM OP-8-2-2D** Tracking Modeling and Predicting the Erosion of Fluorescently Labeled Materials NoninvasivelyN. ARTZI<sup>1,2</sup>, C. PURON<sup>1,3</sup>, A. B. RAMOS<sup>1,3</sup>, A. GROOTHUIS<sup>4</sup>, G. SAHAGIAN<sup>5</sup>, AND E. EDELMAN<sup>1,6</sup><sup>1</sup>MIT, Cambridge, MA, <sup>2</sup>Brigham and Women Hospital, Harvard Medical School, Boston, MA, <sup>3</sup>Institut Quimic de Sarria, Barcelona, Spain, Spain, <sup>4</sup>CBSET, Concord, MA, <sup>5</sup>Tufts University School of Medicine, Boston, MA, <sup>6</sup>Brigham and Women's Hospital, Harvard Medical School, Boston, MA**2:30PM OP-8-2-2E** Irreversible Electroporation Treatment Planning TechniquesR. E. NEAL<sup>1</sup>, P. A. GARCIA<sup>1</sup>, J. H. ROSSMEISL<sup>2</sup>, AND R. V. DAVALOS<sup>1</sup><sup>1</sup>Virginia Tech - Wake Forest School of Biomedical Engineering and Sciences, Blacksburg, VA, <sup>2</sup>Virginia - Maryland Regional College of Veterinary Medicine, Blacksburg, VA**2:45PM OP-8-2-2F** Multifractal and Lacunarity Analysis of MicrovasculatureD. J. GOULD<sup>1,2</sup>, T. J. VADAKKAN<sup>2</sup>, AND M. E. DICKINSON<sup>1,2</sup><sup>1</sup>Rice University, Houston, TX, <sup>2</sup>Baylor College of Medicine, Houston, TX**Track: Biomedical Imaging and Optics – 8-2-3****Biophotonics – I****Chairs:** Kristen Maitland, Brian Sorg

Room 19A

**1:30PM OP-8-2-3A** Fiber Optic Probe for Measuring Changes in Rectal Micro Architecture and Vasculature in Field of Carcinogenesis: Implications for Colon Cancer Risk StratificationN. N. MUTYAL<sup>1</sup>, V. TURZHITSKY<sup>1</sup>, J. ROGERS<sup>1</sup>, A. RADOSEVICH<sup>1</sup>, H. ROY<sup>2</sup>, M. GOLDBERG<sup>2</sup>, M. JAMEEL<sup>2</sup>, A. BOGOJEVICH<sup>2</sup>, AND V. BACKMAN<sup>1</sup><sup>1</sup>Northwestern University, Evanston, IL, <sup>2</sup>Northshore University Healthsystems, Evanston, IL**1:45PM OP-8-2-3B** Simultaneous Imaging of Blood Flow, Hemoglobin Concentration, and Absolute PO<sub>2</sub> *In Vivo* During Stroke Using a Digital Micromirror DeviceA. PONTITCORVO<sup>1</sup>, M. A. DAVIS<sup>1</sup>, AND A. K. DUNN<sup>1</sup><sup>1</sup>University of Texas at Austin, Austin, TX**2:00PM OP-8-2-3C** Blood Vessel Detection in Line-Scanning Laser Ophthalmoscope and Raster Scan Images from Optical Coherence TomographyA. DATTA<sup>1</sup>, S. LIU<sup>1</sup>, G. MURALIDHAR<sup>1</sup>, A. S. PARANJAPÉ<sup>1</sup>, B. ELMAANAOU<sup>1</sup>, J. DEWELLE<sup>1</sup>, T. E. MILNER<sup>1</sup>, H. G. RYLANDER III<sup>1</sup>, AND M. K. MARKEY<sup>1</sup><sup>1</sup>The University of Texas at Austin, Austin, TX**2:15PM OP-8-2-3D** Enhancing Video Capsule Endoscopy: Location and Bleeding DetectionD. L-P. YEUNG<sup>1</sup>, A. SABET<sup>1</sup>, Y. INOUE<sup>1</sup>, AND J. M. YAP<sup>1</sup><sup>1</sup>University of Michigan, Ann Arbor, MI**2:30PM OP-8-2-3E** Image Mapping Spectrometer for Real Time Hyperspectral Imaging of Living CellsL. GAO<sup>1</sup>, R. T. KESTER<sup>1</sup>, N. BEDARD<sup>1</sup>, N. HAGEN<sup>1</sup>, AND T. S. TKACZYK<sup>1</sup><sup>1</sup>Rice University, Houston, TX**2:45PM OP-8-2-3F** Fiber Optic Micro-endoscopy for *In Vivo* Detection of Bacteria in Early Stages of InfectionN. S. MUFTI<sup>1</sup>, Y. KONG<sup>2</sup>, J. D. CIRILLO<sup>2</sup>, AND K. C. MAITLAND<sup>1</sup><sup>1</sup>Texas A&M University, College Station, TX, <sup>2</sup>Texas A&M Health Science Center, College Station, TX**Track: Neural Engineering – 8-2-4****Sensory Neural Prosthetics****Chairs:** Hubert Lim, James Weiland

Room 19B

**1:30PM OP-8-2-4A** A Robust, Multimodal, Biomimetic Tactile SensorJ. A. FISHEL<sup>1,2</sup>, N. WETTELS<sup>1,2</sup>, C. H. LIN<sup>1,2</sup>, Z. SU<sup>1</sup>, AND G. E. LOEB<sup>1,2</sup><sup>1</sup>University of Southern California, Los Angeles, CA, <sup>2</sup>SynTouch, LLC, Los Angeles, CA**1:45PM OP-8-2-4B** Restoring Sensorimotor Function with Utah Slanted Electrode Arrays in Peripheral NervesG. A. CLARK<sup>1</sup>, N. M. LEDBETTER<sup>1</sup>, D. J. WARREN<sup>1</sup>, A. M. WILDER<sup>1</sup>, B. R. DOWDEN<sup>1</sup>, M. A. FRANKEL<sup>1</sup>, C. ETHIER<sup>2</sup>, E. R. OBY<sup>2</sup>, L. E. MILLER<sup>2</sup>, F. SOLZBACHER<sup>1</sup>, R. R. HARRISON<sup>1</sup>, AND R. A. NORMANN<sup>1</sup><sup>1</sup>University of Utah, Salt Lake City, UT, <sup>2</sup>Northwestern University Feinberg School of Medicine, Chicago, IL**2:00PM OP-8-2-4C** Direct Sensory Feedback for Prosthetics: Neural Mechanisms of Function, Plasticity, and OwnershipP. D. MARASCO<sup>1</sup>, A. E. SCHULTZ<sup>2</sup>, K. KIM<sup>3</sup>, J. E. COLGATE<sup>4</sup>, M. A. PESHKIN<sup>4</sup>, AND T. A. KUIKEN<sup>2</sup><sup>1</sup>Louis Stokes Cleveland Department of Veterans Affairs Medical Center, Cleveland, OH, <sup>2</sup>Rehabilitation Institute of Chicago, Chicago, IL, <sup>3</sup>Korea Institute of Science and Technology, Seoul, Korea, Republic of, <sup>4</sup>Northwestern University, Evanston, IL

**2:15PM OP-8-2-4D** Electrical Stimulation of Degenerated Retina with High Resolution ElectrodeJ. WEILAND<sup>1,2</sup>, L. CHAN<sup>1</sup>, A. RAY<sup>1</sup>, AND M. HUMAYUN<sup>1,2</sup><sup>1</sup>University of Southern California, Los Angeles, CA, <sup>2</sup>Doheny Eye Institute, Los Angeles, CA**2:30PM OP-8-2-4E** Solutions to Problem of Electrode Channel Interaction in a Vestibular ProsthesisG. Y. FRIDMAN<sup>1</sup>, C. DAI<sup>1</sup>, N. S. DAVIDOVICS<sup>1</sup>, B. CHIANG<sup>1</sup>, AND C. C. DELLA SANTINA<sup>1</sup><sup>1</sup>Johns Hopkins University, Baltimore, MD**2:45PM OP-8-2-4F** New Directions in Deep Brain Stimulation (DBS) for Hearing Restoration and Tinnitus SuppressionH. H. LIM<sup>1</sup>, M. LENARZ<sup>2</sup>, AND T. LENARZ<sup>2</sup><sup>1</sup>University of Minnesota, Minneapolis, MN, <sup>2</sup>Hannover Medical University, Hannover, Lower Saxony, Germany**Track: Biomedical Engineering Education – 8-2-5****Global Health****Chairs:** Justin Cooper, Mohammad Kiani**Room 18A****1:30PM OP-8-2-5A** Biomedical Technician Assistant (BTA) and Biomedical Engineering Technician Training in RwandaL. E. PERRY<sup>1</sup>, AND R. MALKIN<sup>1</sup><sup>1</sup>Duke University, Durham, NC**1:45PM OP-8-2-5B** Early Experiences Implementing a Low Resource Settings BME Curriculum at the US-Mexico borderT. BOLAND<sup>1</sup><sup>1</sup>University of Texas at El Paso, El Paso, TX**2:00PM OP-8-2-5C** Collaboration for Healthcare in Developing CountriesA. L. LERNER<sup>1</sup>, S. H. SEIDMAN<sup>1</sup>, B. CASTANEDA<sup>2</sup>, AND W. CARRERA<sup>2</sup><sup>1</sup>University of Rochester, Rochester, NY, <sup>2</sup>Pontificia Universidad Catolica del Peru, Lima, Peru**2:15PM OP-8-2-5D** Multifaceted Engineering Education is Facilitated by Design of Medical Devices for KenyaP. J. BUTLER<sup>1</sup>, AND K. MEHTA<sup>1</sup><sup>1</sup>Penn State University, University Park, PA**2:30PM OP-8-2-5E** Design of a Dental Chair for Rural Communities: An International CollaborationG. M. RUIZ SOTO<sup>1</sup>, AND A. LOUIE<sup>2</sup><sup>1</sup>ITESM, Monterrey, Nuevo Leon, Mexico, <sup>2</sup>University of California, Davis, CA**2:45PM OP-8-2-5F** X-Ray Development TimerA. F. BRITT<sup>1</sup>, AND P. G. ANDERSON<sup>2</sup><sup>1</sup>Duke, Winnetka, IL, <sup>2</sup>Duke University, Durham, NC**Track: Cellular and Molecular Engineering – 8-2-6****Cell Adhesion – II****Chairs:** Nathan Gallant, Andres Garcia**Room 18B****1:30PM OP-8-2-6A** Force Dynamics of Cell-Cell Interaction Mediated Through Cell-Matrix AdhesionO. SHEBANOVA<sup>1</sup><sup>1</sup>University of Pennsylvania, Philadelphia, PA**1:45PM OP-8-2-6B** Vinculin Modulates Cell Adhesion Strength in Response to Fibronectin DensityD. W. DUMBAULD<sup>1</sup>, S. W. CRAIG<sup>2</sup>, AND A. J. GARCIA<sup>1</sup><sup>1</sup>Georgia Institute of Technology, Atlanta, GA, <sup>2</sup>The Johns Hopkins School of Medicine, Baltimore, MD**2:00PM OP-8-2-6C** Nitric Oxide Impairs the Adhesive Properties of Dendritic Cells to Extracellular Matrix ComponentsM. GU<sup>1</sup>, J. MCGINTY<sup>2</sup>, A. VENKATESH<sup>1</sup>, M. PATE<sup>2</sup>, AND F. BENENCIA<sup>1,2</sup><sup>1</sup>Russ College of Engineering, Ohio University, Athens, OH, <sup>2</sup>OUCOM, Ohio University, Athens, OH**2:15PM OP-8-2-6D** Structural Elastic Memory of Immune Synapse CytoskeletonE. TABDANOV<sup>1</sup>, E. JUDOKUSUMO<sup>1</sup>, AND L. C. KAM<sup>1</sup><sup>1</sup>Columbia University, New York, NY**2:30PM OP-8-2-6E** Rap1 and SLP-76 are Crucial to Chemokine-Triggered Firm Adhesion of T Cells under FlowD. LEE<sup>1</sup>, J. KIM<sup>1</sup>, G. T. KORETZKY<sup>1</sup>, AND D. A. HAMMER<sup>1</sup><sup>1</sup>University of Pennsylvania, Philadelphia, PA**2:45PM OP-8-2-6F** Characterization of HNSCC Ligand and Endothelium Receptor InteractionsJ. MARSHALL<sup>1</sup>, S. M. WOOD<sup>1</sup>, C. ABRAM<sup>1</sup>, L. NIMRICHTER<sup>2</sup>, AND M. M. BURDICK<sup>1</sup><sup>1</sup>Ohio University, Athens, OH, <sup>2</sup>Universidade do Rio de Janeiro, Rio de Janeiro, Rio de Janeiro, Brazil**Track: Cardiovascular Engineering – 8-2-7****Vascular Structure and Function I: Pathology****Chairs:** Peter Davies, Damir B. Khismatullin**Room 18C****1:30PM OP-8-2-7A** Endothelial DNA Methylation Differences Map to Athero-susceptible and Atheroprotected Sites *In Vivo*J. E. CLARK<sup>1</sup>, AND P. F. DAVIES<sup>1</sup><sup>1</sup>University of Pennsylvania, Philadelphia, PA**1:45PM OP-8-2-7B** Endothelial Gene Connectivity Network Analysis Identifies Distinct Coronary Artery PhenotypesM. CIVELEK<sup>1</sup>, E. MANDUCHI<sup>2</sup>, R. J. RILEY<sup>2</sup>, C. J. STOECKERT JR<sup>2</sup>, AND P. F. DAVIES<sup>2</sup><sup>1</sup>University of California, Los Angeles, Los Angeles, CA, <sup>2</sup>University of Pennsylvania, Philadelphia, PA**2:00PM OP-8-2-7C** Quantitative Mechanical Tests of Mouse Atherosclerotic Plaque StabilityY. WANG<sup>1,2</sup>, J. NING<sup>1</sup>, M. A. SUTTON<sup>1</sup>, AND S. M. LESSNER<sup>1,2</sup><sup>1</sup>University of South Carolina, Columbia, SC, <sup>2</sup>University of South Carolina, School of Medicine, Columbia, SC**2:15PM OP-8-2-7D** Rapid Remodeling of Cardiovascular Tissues During PregnancyS. WELLS<sup>1</sup>, D. DEBAY<sup>1</sup>, A. MOELLER<sup>1</sup>, C. PIERLOT<sup>1</sup>, J. DOANE<sup>1</sup>, AND M. LEE<sup>1</sup><sup>1</sup>Dalhousie University, Halifax, NS, Canada**2:30PM OP-8-2-7E** Hyperglycemia Reduces Nitric Oxide, Increases Nitrotyrosine and Apoptosis in Endothelial CellS. C. ROGERS<sup>1</sup>, AND M. KAVDIA<sup>1</sup><sup>1</sup>University of Arkansas, Fayetteville, AR**2:45PM OP-8-2-7F** Histamine Induces Monocyte Interactions with Arterial Endothelium *In Vitro*C. CHEN<sup>1</sup>, AND D. B. KHISMATULLIN<sup>1</sup><sup>1</sup>Tulane University, New Orleans, LA



**Track: Cardiovascular Engineering – 8-2-8****Cardiovascular Computational Modeling and Measurement – I****Chairs:** Michael Sacks, Fotis Sotiropoulos

Room 18D

**1:30PM OP-8-2-8A** Spatial Characterization of Coronary Artery Pathologies using Optical Coherence TomographyL. M. ELLWEIN<sup>1</sup>, H. OTAKE<sup>2</sup>, B-K. KOO<sup>3</sup>, T. SHINKE<sup>4</sup>, Y. HONDA<sup>2</sup>, J. SHITE<sup>4</sup>, AND J. F. LADISA<sup>1</sup><sup>1</sup>Marquette University, Milwaukee, WI, <sup>2</sup>Stanford University, Stanford, CA, <sup>3</sup>Seoul National University College of Medicine, Seoul, Korea, Republic of, <sup>4</sup>Kobe University Graduate School of Medicine, Kobe, Japan**1:45PM OP-8-2-8B** Differential Gene Expression, Ecm Organization And Multi-scale Mechanics Of The Aortic And Pulmonary ValveC. A. CARRUTHERS<sup>1</sup>, C. M. ALFIERI<sup>2</sup>, E. M. JOYCE<sup>1</sup>, K. E. YUTZEY<sup>2</sup>, AND M. S. SACKS<sup>1</sup><sup>1</sup>University of Pittsburgh, Pittsburgh, PA, <sup>2</sup>Cincinnati Children's Medical Center, Cincinnati, OH**2:00PM OP-8-2-8C** Imaging-Based Lagrangian Fluid-Structure Interaction of the Mitral Valve: Trans-Chordal Fluid DynamicsD. R. EINSTEIN<sup>1</sup>, F. DEL PIN<sup>2</sup>, J-P. RABBAH<sup>3</sup>, S. R. IDELSOHN<sup>4</sup>, A. P. KUPRAT<sup>1</sup>, X. JIAO<sup>5</sup>, J. P. CARSON<sup>1</sup>, A. P. YOGANATHAN<sup>3</sup>, AND K. S. KUNZELMAN<sup>6</sup><sup>1</sup>Pacific Northwest National Laboratory, Richland, WA, <sup>2</sup>Livermore Software Technology Corp, Livermore, CA, <sup>3</sup>Georgia Tech, Atlanta, GA, <sup>4</sup>International Center for Numerical Methods in Engineering (CIMNE), Barcelona, Spain, <sup>5</sup>Stony Brook University, Stony Brook, NY, <sup>6</sup>University of Maine, Lewiston, ME**2:15PM OP-8-2-8D** Multi-modality Experimental Platform for Validation of Dynamic Mitral Valve Computation ModelsJ-P. RABBAH<sup>1</sup>, N. SAIKRISHNAN<sup>1</sup>, AND A. P. YOGANATHAN<sup>1</sup><sup>1</sup>Georgia Institute of Technology, Atlanta, GA**2:30PM OP-8-2-8E** Predicted Arterial Changes during Hypertension using Multi-Scale ModelingH. N. HAYENGA<sup>1</sup>, B. C. THORNE<sup>2</sup>, S. M. PEIRCE<sup>2</sup>, AND J. D. HUMPHREY<sup>1</sup><sup>1</sup>Texas A&M University, College Station, TX, <sup>2</sup>University of Virginia, Charlottesville, VA**2:45PM OP-8-2-8F** Computational Evaluation of Mechanical Heart Valve Prosthesis Performance in Patient-Specific AnatomiesT. LE<sup>1</sup>, I. BORAZJANI<sup>1</sup>, AND F. SOTIROPOULOS<sup>1</sup><sup>1</sup>University of Minnesota, Minneapolis, MN**Track: Respiratory Engineering – 8-2-9****Imaging the Lung – The New Frontier****Chairs:** Eric Hoffman, Grace Parraga

Room 17A

**1:30PM OP-8-2-9A** - Imaging Morphometry of the Acinus Within the Intact Murine LungD. M. VASILESCU<sup>1,2</sup>, A. S. KIZHAKKE PULIYAKOTE<sup>1</sup>, T. M. EGGLESTON<sup>1</sup>, AND E. A. HOFFMAN<sup>1</sup><sup>1</sup>University of Iowa, Iowa City, IA, <sup>2</sup>Philipps University, Marburg, Hessen, Germany**1:45PM OP-8-2-9B** - Effect of Lung Inflation on Canine Airway Dimensions In VivoD. CHON<sup>1</sup>, B. A. SIMON<sup>1,2</sup>, AND D. W. KACZKA<sup>1,2</sup><sup>1</sup>Beth Israel Deaconess Medical Center, Boston, MA, <sup>2</sup>Harvard Medical School, Boston, MA**2:00PM OP-8-2-9C** - Effects of Gas Properties on Regional Ventilation: Comparison between MDCT and MRI AssessmentsY. YIN<sup>1</sup>, A. HALAWEISH<sup>1</sup>, C-L. LIN<sup>1</sup>, E. VAN BEEK<sup>1</sup>, AND E. A. HOFFMAN<sup>1</sup><sup>1</sup>The University of Iowa, Iowa City, IA**2:15PM OP-8-2-9D** Quantification of Lung Pressure Volume Curves and Regional Expansion with Respiratory-Gated I3N2 PETT. J. WELLMAN<sup>1</sup>, T. WINKLER<sup>2</sup>, E. L. COSTA<sup>2</sup>, R. S. HARRIS<sup>2</sup>, G. MUSCH<sup>2</sup>, J. G. VENEGAS<sup>2</sup>, AND M. F. VIDAL MELO<sup>2</sup><sup>1</sup>Boston University, Boston, MA, <sup>2</sup>Massachusetts General Hospital, Boston, MA**2:30PM OP-8-2-9E** The Relationship of Ultra Short Echo Time IH Magnetic Resonance Imaging and Pulmonary Function in Chronic Obstructive Pulmonary DiseaseA. OWRANGI<sup>1,2</sup>, J. X. WANG<sup>1,3</sup>, E. O'RIORDAN<sup>4</sup>, D. G. MCCORMACK<sup>5</sup>, AND G. PARRAGA<sup>1,2</sup><sup>1</sup>Robarts Research Institute, London, Ontario, Canada, <sup>2</sup>Biomedical Engineering, University of Western Ontario, London, Ontario, Canada, <sup>3</sup>General Electric Healthcare CANADA, London, Ontario, Canada, <sup>4</sup>Department of Medical Imaging, University of Western Ontario, London, Ontario, Canada, <sup>5</sup>Division of Respiriology, University of Western Ontario, London, Ontario, Canada**2:45PM OP-8-2-9F** Automatic Segmentation of Ventilation Defects in Hyperpolarized 3He MRIN. J. TUSTISON<sup>1</sup>, B. B. AVANTS<sup>1</sup>, T. A. ALTES<sup>2</sup>, E. E. DE LANGE<sup>2</sup>, J. P. MUGLER<sup>2</sup>, AND J. C. GEE<sup>1</sup><sup>1</sup>University of Pennsylvania, Philadelphia, PA, <sup>2</sup>University of Virginia, Charlottesville, VA**Track: Orthopedic and Rehabilitation****Engineering – 8-2-10****Rehabilitation Engineering****Chairs:** John Desjardins, Joel Stitzel

Room 17B

**1:30PM OP-8-2-10A** Mapping Different Mechanical Response in the Infected and Inflamed Ears with Laser VibrometerC. DAI<sup>1</sup>, X. GUAN<sup>1</sup>, W. LI<sup>1</sup>, D. NAKAMALIL<sup>1</sup>, AND G. R. GAN<sup>1</sup><sup>1</sup>University of Oklahoma, Norman, OK**1:45PM OP-8-2-10B** Dynamic Stability of Walking During Support Surface and Visual Field TranslationsP. M. MCANDREW<sup>1</sup>, J. B. DINGWELL<sup>1</sup>, AND J. M. WILKEN<sup>2</sup><sup>1</sup>University of Texas at Austin, Austin, TX, <sup>2</sup>Center for the Intrepid, Ft. Sam Houston, TX**2:00PM OP-8-2-10C** Feature Projection Framework to Improve the Performance of a Myoelectric Pattern Recognition SystemJ. M. FONTANA<sup>1</sup>, AND A. W. CHIU<sup>1</sup><sup>1</sup>Louisiana Tech University, Ruston, LA**2:15PM OP-8-2-10D** Effect of Endurance Exercise Training and Chronic Ethanol Ingestion on Skeletal Muscle in RatS. Iyer<sup>1</sup>, M. Sackeli<sup>1</sup>, C. Zappacosta<sup>1</sup>, and Y. Gao<sup>1</sup><sup>1</sup>Cornell University, Ithaca, NY**2:30PM OP-8-2-10E** Physical Activity Classification Utilizing Activity Monitors in Manual Wheelchair Users with SCIS. V. HIREMATH<sup>1</sup>, AND D. DING<sup>1</sup><sup>1</sup>University of Pittsburgh, Pittsburgh, PA**2:45PM OP-8-2-10F** The Effects of Computer Keyboarding on Median Nerve Ultrasound MeasuresK. TOOSI<sup>1</sup>, AND M. BONINGER<sup>1</sup><sup>1</sup>University of Pittsburgh, Pittsburgh, PA

**Track: Devices: Nano to Micro – 8-2-11****Drug Delivery Technologies: Nano to Micro Devices – I**

**Chairs:** Tejal Desai, Sihong Wang  
**Room 16A**

**1:30PM OP-8-2-11A** A Strategy for Chronic Convection-Enhanced Drug Delivery to the Brain

E. S.-M. CHANG<sup>1</sup>, AND W. OLBRICHT<sup>1</sup>  
<sup>1</sup>Cornell University, Ithaca, NY

**1:45PM OP-8-2-11B** Multi-functional Coatings for the Delivery of Small Molecule Therapeutics

A. SHUKLA<sup>1</sup>, R. C. SMITH<sup>1</sup>, AND P. T. HAMMOND<sup>1</sup>  
<sup>1</sup>Massachusetts Institute of Technology, Cambridge, MA

**2:00PM OP-8-2-11C** Synthesis of Biodegradable Porous Silicon Nanoneedles for Combined Gene Therapy and Proteomics

C. CHIAPPINI<sup>1</sup>, J. FAKHOURY<sup>2</sup>, X. LIU<sup>2</sup>, E. TASCIOTTI<sup>2</sup>, L. BROUSSEAU<sup>2</sup>, AND M. FERRARI<sup>1,2</sup>  
<sup>1</sup>The University of Texas at Austin, Austin, TX, <sup>2</sup>The University of Texas Health Science Center at Houston, Houston, TX

**2:15PM OP-8-2-11D** Particle Size Dictates the Efficacy of Vascular-Targeted Drug Carrier in Disturbed Flow Relevant in Atherosclerosis

P. CHAROENPHOL<sup>1</sup>, AND O. ENIOLA-ADEFESO<sup>2</sup>  
<sup>1</sup>University of Michigan, Ann Arbor, MI, <sup>2</sup>University of Michigan, Ann Arbor, MI

**2:30PM OP-8-2-11E** The Influence of Size on the Interaction of Nanomaterials with Blood Serum

C. WALKER<sup>1</sup>, AND W. CHAN<sup>1</sup>  
<sup>1</sup>University of Toronto, Toronto, Ontario, Canada

**2:45PM OP-8-2-11F** Metal-Polymer Composite Nanoparticle Systems for Externally Controlled Delivery

M. L. GRAN<sup>1</sup>, AND N. A. PEPPAS<sup>1</sup>  
<sup>1</sup>University of Texas at Austin, Austin, TX

**Track: Devices: Nano to Micro – 8-2-12****Micro and Nanostructured Biomaterials – I**

**Chairs:** Xuanhong Cheng, Song Li  
**Room 16B**

**1:30PM OP-8-2-12A** Microstructures in 3D Culture Alter the Mechanics of Cardiac Myocyte Contraction

M. W. CURTIS<sup>1</sup>, E. BUDYN<sup>1</sup>, T. DESAI<sup>2</sup>, AND B. RUSSELL<sup>1</sup>  
<sup>1</sup>University of Illinois at Chicago, Chicago, IL, <sup>2</sup>University of California at San Francisco, San Francisco, CA

**1:45PM OP-8-2-12B** Purified Single Wall Carbon Nanotubes Reorganize the Actin Cytoskeleton

B. D. HOLT<sup>1</sup>, P. A. SHORT<sup>1</sup>, K. N. DAHL<sup>1</sup>, AND M. F. ISLAM<sup>1</sup>  
<sup>1</sup>Carnegie Mellon University, Pittsburgh, PA

**2:00PM OP-8-2-12C** Nanotube Coatings for Cell Isolation Alter Cell Separation Distance While Preserving Fluid Dynamics

A. D. HUGHES<sup>1</sup>, AND M. R. KING<sup>1</sup>  
<sup>1</sup>Cornell University, Ithaca, NY

**2:15PM OP-8-2-12D** Treatment of Primary Brain Tumors with Thermally Activated Nanoparticles

E. S. DAY<sup>1</sup>, L. ZHANG<sup>2</sup>, P. A. THOMPSON<sup>2</sup>, N. A. LEWINSKI<sup>1</sup>, N. AHMED<sup>2</sup>, N. S. RIGGALL<sup>1</sup>, R. A. DREZEK<sup>1</sup>, S. M. BLANEY<sup>2</sup>, AND J. L. WEST<sup>1</sup>  
<sup>1</sup>Rice University, Houston, TX, <sup>2</sup>Texas Children's Hospital, Houston, TX

**2:30PM OP-8-2-12E** Prostate Cancer Cell Photothermal Therapy with EphrinA1-Targeted Nanoshells

A. J. COUGHLIN<sup>1</sup>, A. M. GOBIN<sup>1</sup>, J. J. MOON<sup>1</sup>, AND J. L. WEST<sup>1</sup>  
<sup>1</sup>Rice University, Houston, TX

**2:45PM OP-8-2-12F** DNA Nanocomplexes Synthesized in a Microfluidic Droplet Generator

Y.-P. HO<sup>1</sup>, C. GRIGSBY<sup>1</sup>, F. ZHAO<sup>1</sup>, H. LI<sup>1</sup>, AND K. W. LEONG<sup>1</sup>  
<sup>1</sup>Duke University, Durham, NC

**Track: Drug Delivery Systems \* – 8-2-13****Novel Materials & Self-Assembling Systems: Cancer Applications**

**Chairs:** Jason Burdick, Horst von Recum  
**Room 14**

**1:30PM OP-8-2-13A** Chitosan Delivery System for Protein-Based Vaccines

M. J. HEFFERNAN<sup>1</sup>, J. W. SCHLOM<sup>1</sup>, AND J. W. GREINER<sup>1</sup>  
<sup>1</sup>National Cancer Institute, Bethesda, MD

**1:45PM OP-8-2-13B** Peptide Amphiphiles for Cancer Therapy

M. BLACK<sup>1</sup>, AND M. TIRRELL<sup>1,2</sup>  
<sup>1</sup>University of California, Santa Barbara, CA, <sup>2</sup>University of California, Berkeley, CA

**2:00PM OP-8-2-13C** - Optimal Conditions for Tumor Retention of a Thermally Responsive Polypeptide After Intratumoral Dosing

W. LIU<sup>1</sup>, J. R. MCDANIEL<sup>1</sup>, X. LI<sup>1</sup>, M. R. ZALUTSKY<sup>1</sup>, AND A. CHILKOTI<sup>1</sup>  
<sup>1</sup>Duke University, Durham, NC

**2:15PM OP-8-2-13D** A Leukolike Multistage Delivery System to Overcome Biological Barriers

N. QUATTROCCHI<sup>1</sup>, C. CHIAPPINI<sup>2</sup>, L. COOPER<sup>3</sup>, M. MASSERINI<sup>4</sup>, M. FERRARI<sup>1</sup>, AND E. TASCIOTTI<sup>1</sup>  
<sup>1</sup>The University of Texas Health Science Center at Houston, Houston, TX, <sup>2</sup>The University of Texas at Austin, Austin, TX, <sup>3</sup>The University of Texas M.D. Anderson Cancer Center, Houston, TX, <sup>4</sup>Universita' Milano Bicocca, Monza, Milano, Italy

**2:30PM OP-8-2-13E** Chimeric Polypeptide-Doxorubicin Nanoparticle Self-Assembly Abolish Tumors After A Single Injection

M. CHEN<sup>1</sup>, J. MACKAY<sup>2</sup>, J. MCDANIEL<sup>1</sup>, W. LIU<sup>1</sup>, T. CHU<sup>1</sup>, A. SIMNICK<sup>1</sup>, AND A. CHILKOTI<sup>1</sup>  
<sup>1</sup>Duke University, Durham, NC, <sup>2</sup>University of Southern California, Los Angeles, CA

**2:45PM OP-8-2-13F** Synthetic Polyphenols for Drug Delivery and Polymer Therapeutics

O. Z. FISHER<sup>1</sup>, R. LANGER<sup>1</sup>, AND D. G. ANDERSON<sup>1</sup>  
<sup>1</sup>MIT, Cambridge, MA

\* Drug Delivery Systems Track is sponsored by Acta Biomaterialia

**Track: New Frontiers in Bioengineering – 8-2-14****Immunobioengineering - II**

**Chairs:** Jeffrey Hubbell, Darrell Irvine  
**Room 15**

**1:30PM OP-8-2-14A** Combinatorial Delivery of TLR 4 and 7 Ligands Using Nanoparticles Mediates Protective Immunity Against Pandemic Influenza

S. P. KASTURI<sup>1</sup>, I. SKOUNTZOU<sup>1</sup>, R. A. ALBRECHT<sup>2</sup>, D. KOUTSONANOS<sup>1</sup>, T. HUA<sup>1</sup>, H. NAKAYA<sup>1</sup>, R. RAVINDRAN<sup>1</sup>, S. STEWART<sup>3</sup>, M. ALAM<sup>3</sup>, N. MURTHY<sup>4</sup>, J. STEEL<sup>2</sup>, J. JACOB<sup>1</sup>, R. J. HOGAN<sup>2</sup>, A. GARCIA-SASTRE<sup>2</sup>, R. COMPANS<sup>1</sup>, AND B. PULENDRAN<sup>1</sup>

<sup>1</sup>Emory University, Atlanta, GA, <sup>2</sup>Mount Sinai School of Medicine, New York, NY, <sup>3</sup>Duke University Medical Center, Durham, NC, <sup>4</sup>Georgia Institute of Technology, Atlanta, GA

**1:45PM OP-8-2-14B** Interbilayer-Crosslinked Multilamellar Vesicles for Antigen Delivery and Vaccine Applications

J. J. MOON<sup>1</sup>, H. SUH<sup>1</sup>, M. SOHAIL<sup>1</sup>, A. BERSHTEYN<sup>1</sup>, A. YADAVA<sup>2</sup>, AND D. J. IRVINE<sup>1,3</sup>  
<sup>1</sup>Massachusetts Institute of Technology, Cambridge, MA, <sup>2</sup>Walter Reed Army Institute of Research, Silver Spring, MD, <sup>3</sup>Howard Hughes Medical Institute, Chevy Chase, MD

**2:00PM OP-8-2-14C** Simultaneous, Single-carrier Delivery of Antigens and Immune-modulatory siRNA to Dendritic Cells

E. R. DAWSON<sup>1</sup>, A. SINGH<sup>1</sup>, T. VO<sup>1</sup>, AND K. ROY<sup>1</sup>  
<sup>1</sup>The University of Texas at Austin, Austin, TX

**2:15PM OP-8-2-14D** Lymphatic Drainage in Immunity: Implications in Lymph Node Targeting Strategies for Immunomodulation

S. N. THOMAS<sup>1</sup>, J. RUTKOWSKI<sup>1</sup>, AND M. A. SWARTZ<sup>1</sup>  
<sup>1</sup>Swiss Federal Institute of Technology, Lausanne, VD, Switzerland

**2:30PM OP-8-2-14E** *In Situ* Regulation of DC Subsets and T Cells Mediates Tumor Regression in Mice

O. A. ALI<sup>1</sup>, D. EMERICH<sup>2</sup>, G. DRANOFF<sup>3</sup>, AND D. J. MOONEY<sup>1</sup>  
<sup>1</sup>Harvard University, Cambridge, MA, <sup>2</sup>Incyto, Inc, Lincoln, RI, <sup>3</sup>Dana Farber Cancer Institute, Boston, MA

**2:45PM OP-8-2-14F** Spatial Coordination of CD28 and CD3 Signaling in Mouse and Human Lymphocytes

K. BASHOUR<sup>1</sup>, J. TSAI<sup>1</sup>, K. SHEN<sup>1,2</sup>, M. L. DUSTIN<sup>3</sup>, AND L. C. KAM<sup>1</sup>  
<sup>1</sup>Columbia University, New York, NY, <sup>2</sup>Harvard University, Cambridge, MA, <sup>3</sup>New York University School of Medicine, New York, NY

**Track:Tissue Engineering \* – 8-2-15****Cardiovascular Tissue Engineering – II**

**Chairs:** Lauren Black, Jeffrey Jacot

**Ballroom F**

**1:30PM OP-8-2-15A** Adipose-Derived Stromal Cell Homing and Recruitment in Angiogenesis in Inflamed Tissue

C. L. MULVEY<sup>1</sup>, P. J. AMOS<sup>1</sup>, AND S. PEIRCE-COTTLER<sup>1</sup>  
<sup>1</sup>University of Virginia, Charlottesville, VA

**1:45PM OP-8-2-15B** Myocyte-Depleted Engineered Cardiac Tissues Support Therapeutic Potential of Mesenchymal Stem Cells

G. W. SERRAO<sup>1</sup>, I. C. TURNBULL<sup>1</sup>, D. ANCUKIEWICZ<sup>1</sup>, Q. R. YOUMANS<sup>1</sup>, L. HADRI<sup>1</sup>, R. J. HAJJAR<sup>1</sup>, AND K. D. COSTA<sup>1</sup>  
<sup>1</sup>Mount Sinai School of Medicine, New York, NY

**2:00PM OP-8-2-15C** Amniotic Fluid-derived Stem Cell Culture on Poly(ethylene glycol) Diacrylate Hydrogels

J. J. PETSCHKE<sup>1</sup>, B. GILL<sup>1</sup>, M. ALIRU<sup>1</sup>, J. L. WEST<sup>1</sup>, AND J. G. JACOT<sup>1,2</sup>  
<sup>1</sup>Rice University, Houston, TX, <sup>2</sup>Texas Children's Hospital, Houston, TX

**2:15PM OP-8-2-15D** Viral Fusogens to Promote Stem Cell Reprogramming via Fusion

B. FREEMAN<sup>1</sup>, AND B. OGLE<sup>1</sup>  
<sup>1</sup>University of Wisconsin-Madison, Madison, WI

**2:30PM OP-8-2-15E** Highly Extensible Hydrogels Capable of Differentiating Mesenchymal Stem Cells Into Cardiomyocytes

Z. LI<sup>1</sup>, AND J. GUAN<sup>2</sup>  
<sup>1</sup>The Ohio State University, Columbus, OH, <sup>2</sup>Ohio State University, Columbus, OH

**2:45PM OP-8-2-15F** Relative Impact of Cell Shape Versus ECM Ligand Identity on MSC Lineage Progression

P. QU<sup>1</sup>, D. MUNOZ-PINTO<sup>1</sup>, AND M. HAHN<sup>1</sup>  
<sup>1</sup>Texas A&M University, College Station, Tx

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

**Track:Tissue Engineering \* – 8-2-16****Engineered Tissue Models for Drug Discovery**

**Chairs:** Deepak Nagrath, Laura Segatori

**Ballroom G**

**1:30PM OP-8-2-16A** Engineering Humanized Mice With Implantable Livers For Drug Development

A. A. CHEN<sup>1,2</sup>, L. ONG<sup>1</sup>, AND S. N. BHATIA<sup>1</sup>  
<sup>1</sup>Massachusetts Institute of Technology, Cambridge, MA, <sup>2</sup>Harvard University, Cambridge, MA

**1:45PM OP-8-2-16B** Detoxification Profiles in Three-Dimensional (3D) Liver Mimetic Cellular Architectures

Y. KIM<sup>1</sup>, AND P. RAJAGOPALAN<sup>1</sup>  
<sup>1</sup>Virginia Polytechnic Institute and State University, Blacksburg, VA

**2:00PM OP-8-2-16C** Engineering Microscale Liver Models for Drug Development

A. MOORE<sup>1</sup>, S. KRZYZEWSKI<sup>1</sup>, J. GAFFNEY<sup>1</sup>, S. MCLEAN<sup>1</sup>, J. MCGEEHAN<sup>1</sup>, AND S. KHETANI<sup>1</sup>  
<sup>1</sup>Hepregen Corporation, Medford, MA

**2:15PM OP-8-2-16D** Quantifying the Extent and Kinetics of Self-Assembly and Self-Sorting in 3D Micro-tissues

T-M. FERRUCCIO<sup>1</sup>, S. MCCALLA<sup>2</sup>, A. TRIPATHI<sup>1</sup>, AND J. MORGAN<sup>1</sup>  
<sup>1</sup>Brown University, Providence, RI, <sup>2</sup>Brown University, Providence, RI

**2:30PM OP-8-2-16E** A Novel *In Vitro* Microenvironment for Drug Delivery Particle Screening

B. PRABHAKARPANDIAN<sup>1</sup>, J. FEWELL<sup>2</sup>, K. ANWER<sup>2</sup>, AND K. PANT<sup>1</sup>  
<sup>1</sup>CFD Research Corporation, Huntsville, AL, <sup>2</sup>EGEN Inc., Huntsville, AL

**2:45PM OP-8-2-16F** The Development of a 3D Tissue Engineered Bone Tumor Model

E. BURDETT<sup>1</sup>, A. G. MIKOS<sup>1</sup>, F. K. KASPER<sup>1</sup>, AND J. A. LUDWIG<sup>2</sup>  
<sup>1</sup>Rice University, Houston, TX, <sup>2</sup>University of Texas M.D. Anderson Cancer Center, Houston, TX

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

**SATURDAY, OCTOBER 9**  
**TODAY'S HIGHLIGHTS**
**PLENARY SESSION**

8:00am - 9:30am

Ballroom D, Convention Center



**BMES 2010 Rita Schaffer Memorial Young Investigator Lecturer:**  
**HOW MATRIX PROPERTIES CONTROL THE SELF-ASSEMBLY AND MAINTENANCE OF TISSUES**

Cynthia Reinhart-King, PhD  
 Cornell University



**Diversity Lecture:**  
**TALK INFORMATION TO COME**

Gilda Barabino, PhD  
 Georgia Institute of Technology and Emory University

**EXHIBIT HALL OPEN**

9:30am - 1:30pm

Exhibit Hall 4, Convention Center

**POSTER SESSION 9A and 9B**

9:30am - 1:00pm

Exhibit Hall 4, Convention Center

**PLATFORM SESSIONS 9-1**

10:30am - 12:00noon

See pages 125-131  
Convention Center
**PLATFORM SESSIONS 9-2**

1:30pm - 3:00pm

See pages 132-137  
Convention Center
**PLATFORM SESSIONS 9-3**

3:45pm - 5:15pm

See pages 138-143  
Convention Center
**Track: Biomedical Engineering Education – PS-9A-1**
**Education Assessment**

**PS-9A-1-1** Assessing Impact of Interdisciplinary Labs on Ability to Solve Multidisciplinary Biomedical Problems

J. D. GASSERT, PH.D., P.E.<sup>1</sup>, J. A. LAMACK, PH.D.<sup>1</sup>, R. J. GERRITS, PH.D.<sup>1</sup>, N. E. SCHLICK, PH.D.<sup>1</sup>, AND L. FENNIGKOH, PH.D., P.E.<sup>1</sup>

<sup>1</sup>Milwaukee School of Engineering, Milwaukee, WI

**Track: Biomedical Engineering Education – PS-9A-2**
**Learning Modules/Instructional Materials**

**PS-9A-2-2** Teaching Creative Problem-Solving with a Science Fiction-Inspired Research Proposal

M. ALI<sup>1</sup>, AND R. G. VOSS<sup>1</sup>

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

**PS-9A-2-3** Teaming Undergraduate Bioengineering & Graduate Physical Therapy Students: A Case Study

K. R. CSAVINA<sup>1</sup>, AND M. VENGLAR<sup>1</sup>

<sup>1</sup>Florida Gulf Coast University, Fort Myers, FL

**Track: Biomedical Imaging and Optics – PS-9A-3**
**Imaging Technology Development (including Biophotonics)**

**PS-9A-3-4** Selective Two-photon Excitation by Phase and Amplitude Shaping of a Broadband Coherent Fiber Supercontinuum

Y. LIU<sup>1</sup>, B. W. GRAF<sup>1</sup>, H. TU<sup>1</sup>, E. J. CHANEY<sup>1</sup>, U. SHARMA<sup>1</sup>, AND S. A. BOPPART<sup>1</sup>

<sup>1</sup>University of Illinois at Urbana-Champaign, Urbana, IL

**PS-9A-3-5** Evaluation of Noise Power Spectrum of Variable Resolution Computer Tomography Images

K. DEVISETTI<sup>1</sup>, AND F. DIBIANCA<sup>1</sup>

<sup>1</sup>University of Tennessee Health Science Center, Memphis, TN

**PS-9A-3-6** Characterization of Corneal Birefringence Towards the Development of a Polarimetric Glucose Monitor

B. H. MALIK<sup>1</sup>, AND G. L. CÔTÉ<sup>1</sup>

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

**PS-9A-3-7** Projection Spatial Resolution Measurement for Variable Resolution X-Ray Cone Beam CT System

S. ARIKAPUDI<sup>1</sup>, AND F. A. DIBIANCA<sup>1</sup>

<sup>1</sup>University of Tennessee Health Science Center, Memphis, TN

**PS-9A-3-8** Piezoelectric MEMS Scanning Mirror for Endoscopic Imaging

K. H. GILCHRIST<sup>1</sup>, AND S. GREGO<sup>1</sup>

<sup>1</sup>RTI International, Research Triangle Park, NC

**PS-9A-3-9** Polarization Sensitive Monte Carlo Simulation of Layered Tissues

J. SALAZAR<sup>1</sup>, C-W. KAN<sup>1</sup>, D. CÔTÉ<sup>2</sup>, K. SOKOLOV<sup>3</sup>, AND M. K. MARKEY<sup>1</sup>

<sup>1</sup>The University of Texas at Austin, Austin, TX, <sup>2</sup>Centre de Recherche Université Laval Robert Giffard, Quebec City, Quebec, Canada, <sup>3</sup>The University of Texas M.D. Anderson Cancer Center, Austin, TX

**PS-9A-3-10** Optimization of EPI Distortion Correction in a Pediatric DTI Multi-center Study

A. NAYAK<sup>1</sup>, L. WALKER<sup>1</sup>, AND C. PIERPAOLI<sup>1</sup>

<sup>1</sup>NICHD, National Institutes of Health, Bethesda, MD

**PS-9A-3-11** Investigating the Carbodiimide Mediated Conjugation of Quantum Dots to ProteinsF. SONG<sup>1</sup>, AND W. C. CHAN<sup>1</sup><sup>1</sup>University of Toronto, Toronto, Ontario, Canada**PS-9A-3-12** Optode-Based High-Resolution Chemical Imaging of 2D SurfacesP. AHUJA<sup>1</sup>, S. NAIR<sup>1</sup>, AND M. GRATZL<sup>1</sup><sup>1</sup>Case Western Reserve University, Cleveland, OH**PS-9A-3-13** CT Based Three-Dimensional Measurement of Orbit and Eye AnthropometryK. L. LOFTIS<sup>1</sup>, A. A. WEAVER<sup>1</sup>, J. C. TAN<sup>2</sup>, S. M. DUMA<sup>3,4</sup>, AND J. D. STITZEL<sup>1,2</sup><sup>1</sup>VT-WFVU Center for Injury Biomechanics, Winston-Salem, NC, <sup>2</sup>Wake Forest University School of Medicine, Winston-Salem, NC, <sup>3</sup>VT-WFVU Center for Injury Biomechanics, Blacksburg, VA, <sup>4</sup>Virginia Polytechnic Institute and State University, Blacksburg, VA**PS-9A-3-14** Compact and Light-weight Telemedicine Microscope based on Lensfree On-Chip ImagingO. MUDANYALI<sup>1</sup>, D. TSENG<sup>1</sup>, S. O. ISIKMAN<sup>1</sup>, I. SENCAN<sup>1</sup>, W. BISHARA<sup>1</sup>, C. OZTOPRAK<sup>1</sup>, S. SEO<sup>2</sup>, B. KHADEMHOSEINI<sup>1</sup>, AND A. OZCAN<sup>1,3</sup><sup>1</sup>UCLA, Los Angeles, CA, <sup>2</sup>Korea University, Seoul, Jochiwon, Korea, Republic of, <sup>3</sup>California NanoSystems Institute (CNSI), Los Angeles, CA**PS-9A-3-15** Multiphoton Microscopy of Cleared Mouse OrgansS. G. PARRA<sup>1</sup>, T. H. CHIA<sup>1</sup>, J. P. ZINTER<sup>1</sup>, AND M. J. LEVENE<sup>1</sup><sup>1</sup>Yale University, New Haven, CT**PS-9A-3-16** Primary Development of Emmetropic Spectacles: Ranging SystemQ. DU<sup>1</sup>, AND F. A. DIBIANCA<sup>1</sup><sup>1</sup>University of Tennessee Health Science Center, Memphis, TN**PS-9A-3-17** Interferometric Reflectance Imaging: A Label-Free, High-Throughput, and Dynamic Approach to Pathogen DiagnosticsC. A. LOPEZ<sup>1</sup>, G. DAABOUL<sup>1</sup>, J. H. CONNOR<sup>1</sup>, AND S. UNLU<sup>1</sup><sup>1</sup>Boston University, Boston, MA**PS-9A-3-18** Parameters Affecting Light Transmission through Tissue Using Optical Clearing DevicesA. IZQUIERDO-ROMAN<sup>1</sup>, W. C. VOGT<sup>1</sup>, R. ANDRIANI<sup>1</sup>, AND C. G. RYLANDER<sup>1</sup><sup>1</sup>Virginia Tech, Blacksburg, VA**PS-9A-3-19** Effect of Mechanical Compression on Refractive Index and Optical Penetration Depth of Light in SkinA. A. GURJARPADHYE<sup>1</sup>, W. C. VOGT<sup>1</sup>, A. IZQUIERDO-ROMAN<sup>1</sup>, AND C. G. RYLANDER<sup>1</sup><sup>1</sup>Virginia Polytechnic and State University, Blacksburg, VA**PS-9A-3-20** Automated Detection of Fiducial Points in 3D Torso ImagesM. M. KAWALE<sup>1</sup>, A. BOSE<sup>1</sup>, G. P. REECE<sup>2</sup>, E. K. BEAHM<sup>2</sup>, M. A. CROSBY<sup>2</sup>, M. K. MARKEY<sup>3</sup>, AND F. A. MERCHANT<sup>1,4</sup><sup>1</sup>University of Houston, Houston, TX, <sup>2</sup>The University of Texas MD Anderson Cancer Center, Houston, TX, <sup>3</sup>The University of Texas at Austin, Austin, TX, <sup>4</sup>University of Houston, Houston, TX**PS-9A-3-21** Visualization Tools for Pol-MC to Simulate Polarized Light-Tissue InteractionA. MIRANDA<sup>1</sup>, C-W. KAN<sup>1</sup>, D. CÔTÉ<sup>2</sup>, K. SOKOLOV<sup>3</sup>, AND M. K. MARKEY<sup>1</sup><sup>1</sup>The University of Texas at Austin, Austin, TX, <sup>2</sup>Centre de Recherche Université Laval Robert Giffard, Quebec City, Quebec, Canada, <sup>3</sup>The University of Texas M.D. Anderson Cancer Center, Austin, TX**PS-9A-3-22** Probing Optical Properties of Gold-Silica-Gold Multilayer Nanoshells (MNSs) with Broken SymmetryS. J. NOELCK<sup>1</sup>, Y. HU<sup>1</sup>, AND R. DREZEK<sup>1</sup><sup>1</sup>Rice University, Houston, TX**PS-9A-3-23** Novel Compact Flexible Endoscope Design for Simultaneous Wide-field Multispectral Fluorescence Lifetime Imaging Microscopy (FLIM)S. CHENG<sup>1</sup>, J. JABBOUR<sup>1</sup>, K. MAITLAND<sup>1</sup>, AND J. A. JO<sup>1</sup><sup>1</sup>Texas A&M University, College Station, TX**PS-9A-3-24** High-resolution Lensfree On-chip Microscopy for Wide-field ImagingW. BISHARA<sup>1</sup>, T-W. SU<sup>1</sup>, A. F. COSKUN<sup>1</sup>, AND A. OZCAN<sup>1,2</sup><sup>1</sup>UCLA Electrical Engineering Department, Los Angeles, CA, <sup>2</sup>California NanoSystems Institute, UCLA, Los Angeles, CA**PS-9A-3-25** Liver Tissue Analysis Using a Multiclass Algorithm and Dual-Excitation Autofluorescence SpectroscopyV. R. SAUVAGE<sup>1</sup>, H. T. NGUYEN<sup>1,2</sup>, R. HILL<sup>1</sup>, D. CONCAS<sup>1</sup>, A. LEVENE<sup>1</sup>, M. R. THURSD<sup>1</sup>, R. D. GOLDIN<sup>1</sup>, Q. M. ANSTEE<sup>1</sup>, AND D. S. ELSON<sup>1</sup><sup>1</sup>Imperial College London, London, United Kingdom, <sup>2</sup>École Normale Supérieure de Cachan, Cachan, France**PS-9A-3-26** A LabVIEW-based Operating System for a Multi-channel MRI TransmitterK. L. MOODY<sup>1</sup>, N. A. HOLLINGSWORTH<sup>1</sup>, D. NOLL<sup>2</sup>, S. M. WRIGHT<sup>1</sup>, AND M. P. MCDUGALL<sup>1</sup><sup>1</sup>Texas A&M University, College Station, TX, <sup>2</sup>University of Michigan, Ann Arbor, MI**PS-9A-3-27** High Frequency Ultrasound Characterization of Three-Dimensional Engineered TissuesN. BERRY<sup>1</sup>, M. HELGUERA<sup>2</sup>, D. HOCKING<sup>1</sup>, AND D. DALECKI<sup>1</sup><sup>1</sup>University of Rochester, Rochester, NY, <sup>2</sup>Rochester Institute of Technology, Rochester, NY**PS-9A-3-28** TIM-OS, A General Monte Carlo Optical Simulator for Biomedical OpticsH. SHEN<sup>1</sup>, W. C. VOGT<sup>1</sup>, C. G. RYLANDER<sup>1</sup>, AND G. WANG<sup>1</sup><sup>1</sup>Virginia Tech, Blacksburg, VA**PS-9A-3-29** Development of a Red Blood Cell-based Sensing Platform for Continuous Blood Analyte MonitoringS. RITTER<sup>1</sup>, M. MILANICK<sup>2</sup>, AND K. MEISSNER<sup>1</sup><sup>1</sup>Texas A&M University, College Station, TX, <sup>2</sup>University of Missouri, Columbia, MO**PS-9A-3-30** Ultrasound Image Analysis of Localized Pediatric SclerodermaJ. M. DESAI<sup>1</sup>, S. LI<sup>2</sup>, A. RITTER<sup>1</sup>, AND H. MAN<sup>1</sup><sup>1</sup>Stevens Institute of Technology, Hoboken, NJ, <sup>2</sup>Hackensack University Medical Center, Hackensack, NJ**PS-9A-3-31** Combined AFM-WGM Sensing-Imaging Technique Using QD Embedded MicrospheresS. AMINI<sup>1</sup>, Z. SUN<sup>2</sup>, G. A. MEININGER<sup>2</sup>, AND K. E. MEISSNER<sup>1</sup><sup>1</sup>Texas A&M University, College Station, TX, <sup>2</sup>University of Missouri, Columbia, MO**PS-9A-3-32** Preliminary Quality Assessment of Speckle Patterns on Soft Tissues for Digital Image CorrelationJ. NING<sup>1</sup>, V. G. BRAXTON<sup>2</sup>, Y. WANG<sup>1</sup>, M. A. SUTTON<sup>1</sup>, Y. WANG<sup>1</sup>, AND S. M. LESSNER<sup>2</sup><sup>1</sup>University of South Carolina, Columbia, SC, <sup>2</sup>University of South Carolina School of Medicine, Columbia, SC**PS-9A-3-33** Time-resolved Fluorescence Spectroscopy for Intraoperative Diagnosis of Oral CancerH. XIE<sup>1</sup>, Y. SUN<sup>1</sup>, AND L. MARCU<sup>1</sup><sup>1</sup>University of California - Davis, Davis, CA**PS-9A-3-34** A Fourth Gradient Coil for Slice Dependent Phase Compensation with Planar RF Coil ArraysJ. C. BOSSHARD<sup>1</sup>, E. P. EIGENBRODT<sup>1</sup>, M. P. MCDUGALL<sup>1</sup>, AND S. M. WRIGHT<sup>1</sup><sup>1</sup>Texas A&M University, College Station, TX**PS-9A-3-35** Design and Development of an Integrated OCT and FLIM Catheter for Percutaneous Investigation of Atherosclerotic PlaquesJ. PARK<sup>1</sup>, J. A. JO<sup>1</sup>, S. SHRESTHA<sup>1</sup>, P. PANDE<sup>1</sup>, AND B. E. APPLEGATE<sup>1</sup><sup>1</sup>Texas A&M University, College Station, TX**PS-9A-3-36** Development of a Whole-spectrum Fluorescence MicroscopeR. PETERSON<sup>1</sup>, S. XIAO<sup>1</sup>, S. HUSSAIN<sup>1</sup>, V. E. CENTONZE<sup>2</sup>, J. D. LECHLEITER<sup>2</sup>, AND J. YE<sup>1</sup><sup>1</sup>UTSA, San Antonio, TX, <sup>2</sup>UTHSCSA, San Antonio, TX**PS-9A-3-37** Integrating Fourier Phase Microscopy with Optical Tweezers to Study Plasma Membrane MechanicsM. SARSHAR<sup>1</sup>, N. KHATIBZADEH<sup>1</sup>, S. GUPTA<sup>1</sup>, W. E. BROWNELL<sup>2</sup>, AND B. ANVARI<sup>1</sup><sup>1</sup>University of California, Riverside, Riverside, CA, <sup>2</sup>Baylor College of Medicine, Houston, TX

**PS-9A-3-38** Design Considerations When Adapting a Planar Array of Coils for 3D WFOV MicroscopyE. P. EIGENBRODT<sup>1</sup>, J. BOSSHARD<sup>1</sup>, S. M. WRIGHT<sup>1</sup>, AND M. P. MCDUGALL<sup>1</sup>  
<sup>1</sup>Texas A&M University, College Station, TX**PS-9A-3-39** Common-Path Endoscopic Fourier Domain OCT with a Michelson Interferometer-based CompensatorR. WANG<sup>1</sup>, R. GOODWIN<sup>2</sup>, R. R. MARKWALD<sup>3</sup>, AND B. Z. GAO<sup>1</sup>  
<sup>1</sup>Clemson Univ., Clemson, SC, <sup>2</sup>University of South Carolina, Columbia, SC, <sup>3</sup>Medical University of South Carolina, Charleston, SC**PS-9A-3-40** Lensless On-chip Microscope as a Portable Semen Analysis DeviceT-W. SU<sup>1</sup>, D. K. TSENG<sup>1</sup>, AND A. OZCAN<sup>1</sup>  
<sup>1</sup>University of California, Los Angeles, Los Angeles, CA**PS-9A-3-41** Development of a Multimodal Tissue Diagnostic SystemY. SUN<sup>1</sup>, Y. H. SUN<sup>1</sup>, D. S. ELSON<sup>2</sup>, H. XIE<sup>1</sup>, M. LAM<sup>1</sup>, J. PHIPPS<sup>1</sup>, S. TINGLING<sup>1</sup>, G. FARWELL<sup>1</sup>, J. M. CANNATA<sup>3</sup>, K. SHUNG<sup>3</sup>, AND L. MARCU<sup>1</sup>  
<sup>1</sup>UC Davis, Davis, CA, <sup>2</sup>Imperial College of London, London, United Kingdom, <sup>3</sup>University of Southern California, Los Angeles, CA**PS-9A-3-42** Multiphoton Flow Cytometry for the Characterization and Purification of Large Cellular AggregatesD. G. BUSCHKE<sup>1</sup>, J. SQUIRRELL<sup>1</sup>, K. ELICEIRI<sup>1</sup>, AND B. OGLE<sup>1</sup>  
<sup>1</sup>University of Wisconsin-Madison, Madison, WI**PS-9A-3-43** Malaria Detection DeviceS. KHOSLA<sup>1</sup>, J. DIAN<sup>2</sup>, M. LABRECQUE<sup>2</sup>, A. PERSAD<sup>2</sup> AND S. MEHRVAR<sup>2</sup>  
<sup>1</sup>Sentinel Medical Inc., <sup>2</sup>University of Toronto, Toronto, Ontario, Canada**Track: Cardiovascular Engineering – PS-9A-4****Heart Valve Structure-Function Relations and Computational Simulation****PS-9A-4-44** Oscillatory Shear Flow Drives Mesenchymal Transformation of Embryonic and Adult Valve Endothelial CellsG. J. MAHLER<sup>1</sup>, AND J. T. BUTCHER<sup>1</sup>  
<sup>1</sup>Cornell University, Ithaca, NY**PS-9A-4-45** A Computational Model to Quantify Leaflet Wrinkling: Road to Assess Tissue Fatigue & Leaflet TearingA. FALAHATPISHEH<sup>1</sup>, AND A. KHERADVAR<sup>1</sup>  
<sup>1</sup>University of South Carolina, Columbia, SC**PS-9A-4-46** Pathologic Alterations in Shear Stress Magnitude Induce Valvular Endothelial ActivationD. HOEHN<sup>1</sup>, L. SUN<sup>1</sup>, AND P. SUCOSKY<sup>1</sup>  
<sup>1</sup>University of Notre Dame, Notre Dame, IN**PS-9A-4-47** Annulus Tension of Tricuspid Valve AnnulusS. BHATTACHARYA<sup>1</sup>, AND Z. HE<sup>1</sup>  
<sup>1</sup>Texas Tech University, Lubbock, TX**PS-9A-4-48** Valvular Endothelial Cell-Derived Nitric Oxide Reduces Interstitial Cell CalcificationJ. RICHARDS<sup>1</sup>, S. CHEN<sup>1</sup>, AND J. BUTCHER<sup>1</sup>  
<sup>1</sup>Cornell University, Ithaca, NY**PS-9A-4-49** Micromechanics of the Anterior Mitral Valve Leaflet Under Physiological DeformationsC. A. CARRUTHERS<sup>1</sup>, J. LIAO<sup>2</sup>, AND M. S. SACKS<sup>1</sup>  
<sup>1</sup>University of Pittsburgh, Pittsburgh, PA, <sup>2</sup>Mississippi State University, Mississippi State, MS**PS-9A-4-50** Cyclic Strain Activates Aortic Valve Endothelial Cells in a Side-Specific MannerS. A. METZLER<sup>1</sup>, C. MCINTOSH<sup>1</sup>, A. RUHL<sup>1</sup>, AND J. N. WARNOCK<sup>1</sup>  
<sup>1</sup>Mississippi State University, Mississippi State, MS**PS-9A-4-51** Measurement of Chordal Forces of the Tricuspid Valve using Miniature C RingsL. G. TROXLER<sup>1</sup>  
<sup>1</sup>Georgia Tech Institute for Science and Technology, Conyers, GA**PS-9A-4-52** Characterization of Bicuspid Aortic Valve Hemodynamics using Particle Image Velocimetry (PIV)N. SAIKRISHNAN<sup>1</sup>, C-H. YAP<sup>1</sup>, AND A. P. YOGANATHAN<sup>1</sup>  
<sup>1</sup>Georgia Institute of Technology, Atlanta, GA**PS-9A-4-53** Determination of Atrioventricular Cushion Material Properties in a Developing Chick EmbryoS. BIECHLER<sup>1</sup>, J. MORAVEJI<sup>1</sup>, J. W. WEIDNER<sup>1</sup>, R. L. GOODWIN<sup>1</sup>, D. DEAN<sup>2</sup>, AND A. KHERADVAR<sup>1</sup>  
<sup>1</sup>University of South Carolina, Columbia, SC, <sup>2</sup>Clemson University, Clemson, SC**PS-9A-4-54** Tricuspid Valve Leaflet Stretch: The Effect of Diseased Conditions and a Saddle-Shaped AnnulusD. BUICE<sup>1</sup>, E. SPINNER<sup>1,2</sup>, C. YAP<sup>1</sup>, AND A. YOGANATHAN<sup>1</sup>  
<sup>1</sup>Georgia Institute of Technology, Atlanta, GA, <sup>2</sup>Emory University, Atlanta, GA**PS-9A-4-55** Meso-Scale Testing of Fiber Bundles and Membranes of the Aortic ValveC. A. ROCK<sup>1</sup>, O. KOMOLAFE<sup>1</sup>, AND T. DOEHRING<sup>1</sup>  
<sup>1</sup>Drexel University, Philadelphia, PA**Track: Cardiovascular Engineering – PS-9A-5****Thrombosis and Hemostasis****PS-9A-5-56** Engineering an Actively Thromboresistant Blood-contacting InterfaceZ. QU<sup>1</sup>, S. MUTHUKRISHNAN<sup>2</sup>, M. K. URLAM<sup>2</sup>, C. A. HALLER<sup>2</sup>, V. KUMAR<sup>1</sup>, U. M. MARZEC<sup>3,4</sup>, S. R. HANSON<sup>3,4</sup>, J. LAHANN<sup>5</sup>, AND E. L. CHAIKOF<sup>1,2</sup>  
<sup>1</sup>Georgia Institute of Technology, Atlanta, GA, <sup>2</sup>Emory University, Atlanta, GA, <sup>3</sup>Oregon National Primate Research Center, Beaverton, OR, <sup>4</sup>Oregon Health and Science University, Portland, OR, <sup>5</sup>University of Michigan, Ann Arbor, MI**PS-9A-5-57** The Effects of Wall Shear Rate on Microparticle (MP) Adhesion to Plasma FibronectinY-H. LEE<sup>1</sup>, M. FRANCIS-SEDLAK<sup>1</sup>, C. HALL<sup>2</sup>, AND V. TURITTO<sup>1</sup>  
<sup>1</sup>Illinois Institute of Technology, Chicago, IL, <sup>2</sup>The College of New Jersey, Ewing, NJ**PS-9A-5-58** Amphiphilic Silicones with Reduced Blood Protein AdsorptionM. L. GIESE<sup>1</sup>, B. M. BAILEY<sup>1</sup>, AND M. A. GRUNLAN<sup>1</sup>  
<sup>1</sup>Texas A&M University, College Station, TX**PS-9A-5-59** A Novel Characterization of Platelet Deposition in a Focal Injury ModelT. V. COLACE<sup>1</sup>  
<sup>1</sup>University of Pennsylvania, Philadelphia, PA**PS-9A-5-60** The VWF Propeptide Binds And Inhibits The Function of Multimeric VWF In BloodS. R. MADABHUSHI<sup>1</sup>, C. SHANG<sup>1</sup>, K. M. DAYANANDA<sup>1</sup>, T. RYAN<sup>2</sup>, AND S. NEELAMEGHAM<sup>1</sup>  
<sup>1</sup>State University of New York at Buffalo, Buffalo, NY, <sup>2</sup>Reichert Inc., Depew, NY**PS-9A-5-61** Thrombin Flux and Shear Rate Regulate Fibrin Fiber Deposition State During Polymerization Under FlowK. NEEVES<sup>1,2</sup>, D. ILLING<sup>1</sup>, AND S. DIAMOND<sup>3</sup>  
<sup>1</sup>Colorado School of Mines, Golden, CO, <sup>2</sup>University of Colorado, Denver, Aurora, CO, <sup>3</sup>University of Pennsylvania, Philadelphia, PA**PS-9A-5-62** Polymer Hydrogel for Hemostatic ApplicationA. M. BEHRENS<sup>1</sup>, B. J. CASEY<sup>1</sup>, Z. TSINAS<sup>2</sup>, J. R. HESS<sup>3</sup>, Z. J. WU<sup>3</sup>, B. P. GRIFFITH<sup>3</sup>, AND P. KOFINAS<sup>1</sup>  
<sup>1</sup>University of Maryland, College Park, MD, <sup>2</sup>National Technical University of Athens, Athens, Greece, <sup>3</sup>University of Maryland School of Medicine, Baltimore, MD

**PS-9A-5-63** Simultaneous Sensing of Factor Xa and Thrombin Activity with Quantum Dot-Fluorescent Protein FRET ProbesB. REN<sup>1</sup>, AND G. BAO<sup>1</sup><sup>1</sup>Georgia Institute of Technology, Atlanta, GA**PS-9A-5-64** Effect of Platelet-Derived Nitric Oxide on Platelet Percentage Coverage under Static ConditionsM. G. WATSON<sup>1</sup>, J. M. LOPEZ<sup>1</sup>, A. J. VEVERKA<sup>2</sup>, AND S. A. JONES<sup>1</sup><sup>1</sup>Louisiana Tech University, Ruston, LA, <sup>2</sup>University of Akron, Akron, OH**PS-9A-5-65** Computational Model of Mural Thrombogenesis Predicts Platelet Deposition Rates in Baboon ModelsS. RUGONYI<sup>1</sup>, E. TUCKER<sup>1</sup>, U. MARZEC<sup>1</sup>, A. GRUBER<sup>1</sup>, AND S. HANSON<sup>1</sup><sup>1</sup>Oregon Health & Science University, Portland, OR**PS-9A-5-66** Improving Layer-by-Layer Nanoassembly Surface Morphology: Dynamic Layered Flat BiointerfacesJ. M. LOPEZ<sup>1</sup>, M. G. WATSON<sup>1</sup>, AND S. A. JONES<sup>1</sup><sup>1</sup>Louisiana Tech University, Ruston, LA**PS-9A-5-67** Hemocompatibility of a Novel Hyaluronan-High Density Polyethylene CompositeS. S. YONEMURA<sup>1</sup>, B. S. SMITH<sup>1</sup>, M. H. FORLEO<sup>1</sup>, S. P. JAMES<sup>1,2</sup>, K. C. POPAT<sup>1,2</sup>, AND L. P. DAS<sup>1,2</sup><sup>1</sup>School of Biomedical Engineering, Colorado State University, Fort Collins, CO, <sup>2</sup>Department of Mechanical Engineering, Colorado State University, Fort Collins, CO**Track: Cellular and Molecular Engineering – PS-9A-6****The Physics and Engineering of Cancer Cells and Their Microenvironment****PS-9A-6-68** The Role of the Tumor Vascular Niche in Regulating the Angiogenic Potential of Breast Cancer CellsC. F. BUCHANAN<sup>1</sup>, C. S. SZOT<sup>1</sup>, S. AKMAN<sup>2</sup>, J. W. FREEMAN<sup>1</sup>, AND M. N. RYLANDER<sup>1</sup><sup>1</sup>Virginia Tech, Blacksburg, VA, <sup>2</sup>Wake Forest University School of Medicine, Winston-Salem, NC**PS-9A-6-69** Mechanobiology of Mammary Stroma Following Radiation Therapy (RT)M. A. QAYYUM<sup>1,2</sup>, J. XU<sup>1</sup>, AND M. F. INSANA<sup>1,2</sup><sup>1</sup>University of Illinois, Urbana, IL, <sup>2</sup>Beckman Institute for Advanced Science and Technology, Urbana, IL**PS-9A-6-70** The Role of Biophysical and Biochemical Signals in Epithelial-Mesenchymal TransitionQ. K. CHEN<sup>1</sup>, E. W. GOMEZ<sup>1</sup>, D. C. RADISKY<sup>2</sup>, AND C. M. NELSON<sup>1</sup><sup>1</sup>Princeton University, Princeton, NJ, <sup>2</sup>Mayo Clinic Cancer Center, Jacksonville, FL**PS-9A-6-71** Mechanobiology at Topological Interfaces: Observations and Implications for Tumor InfiltrationT. A. ULRICH<sup>1,2</sup>, AND S. KUMAR<sup>1,2</sup><sup>1</sup>University of California, Berkeley, Berkeley, CA, <sup>2</sup>UCSF/UC Berkeley Joint Graduate Group in Bioengineering, Berkeley, CA**PS-9A-6-72** Bacteria Invasion Mechanism in Cancer and Normal CellsJ. HONG<sup>1</sup>, S. PARK<sup>1</sup>, AND J. H. SHIN<sup>1</sup><sup>1</sup>KAIST, Daejeon, Daejeon, Korea, Republic of**PS-9A-6-73** Adhesion of Wild Type and 4 Signaling-defect Mammary Cancer Cells to Brain EndotheliumJ. FAN<sup>1</sup>, B. CAI<sup>1</sup>, Y. HAO<sup>2</sup>, F. GIANCOTTI<sup>2</sup>, AND B. M. FU<sup>1</sup><sup>1</sup>The City College of New York, New York, NY, <sup>2</sup>Memorial Sloan-Kettering Cancer Institute, New York, NY**PS-9A-6-74** Force Characterization of Tissue from Normal, Pre-invasive and Invasive Breast CancerC. C. DUFORT<sup>1</sup>, J. LOPEZ<sup>1</sup>, H. YU<sup>1</sup>, I. KANG<sup>1</sup>, I. ACERBI<sup>2</sup>, S. HWANG<sup>1</sup>, A. AU<sup>1</sup>, AND V. WEAVER<sup>1</sup><sup>1</sup>University of California, San Francisco, San Francisco, CA, <sup>2</sup>Universitat de Barcelona, Barcelona, Spain**PS-9A-6-75** Laminin Enhances Expansion of a Bone Marrow Precursor in The Presence of Tumor FactorsH. NANDIGAN<sup>1</sup>, J. MCGINTY<sup>2</sup>, M. PATE<sup>2</sup>, AND F. BENENCIA<sup>1,2</sup><sup>1</sup>Russ College of Engineering, Ohio University, Athens, OH, <sup>2</sup>OUCOM, Ohio University, Athens, OH**PS-9A-6-76** Biophysical Characterization of CD44v-Counter Receptor Interactions using Force SpectroscopyP. S. RAMAN<sup>1</sup>, C. S. ALVES<sup>1</sup>, D. WIRTZ<sup>1</sup>, AND K. KONSTANTOPOULOS<sup>1</sup><sup>1</sup>Johns Hopkins University, Baltimore, Maryland**PS-9A-6-77** Increased Asymmetric and Multi-Polar Divisions in Mechanically Confined MicroenvironmentsW. M. WEAVER<sup>1</sup>, H. T. TSE<sup>1</sup>, AND D. DI CARLO<sup>1,2</sup><sup>1</sup>University of California, Los Angeles, Los Angeles, CA, <sup>2</sup>California NanoSystems Institute, Los Angeles, CA**PS-9A-6-78** The Interplay Between Three Dimensional Microenvironment and Breast Cancer InvasionL. CASSEREAU<sup>1</sup>, J. LOPEZ<sup>2</sup>, AND V. WEAVER<sup>2,3</sup><sup>1</sup>UC Berkeley/UCSF, Berkeley, CA, <sup>2</sup>UCSF, San Francisco, CA, <sup>3</sup>Institute of Regenerative Medicine, UCSF, San Francisco, CA**PS-9A-6-79** Substrate Elasticity Mediates Metastasis Like Phenotype In Vitro in HCT-8 CellsX. TANG<sup>1</sup>, T. B. KUHLENSCHMIDT<sup>1</sup>, M. S. KUHLENSCHMIDT<sup>1</sup>, AND T. A. SAIF<sup>1</sup><sup>1</sup>University of Illinois at Urbana-Champaign, Urbana, IL**PS-9A-6-80** Development of Cancer Traps for Eliminating Metastatic Cancer Cells In VivoC-Y. KO<sup>1,2</sup>, A. NAIR<sup>1,3</sup>, Y-T. TSAI<sup>1,3</sup>, J. ZHOU<sup>1</sup>, AND L. TANG<sup>1,3</sup><sup>1</sup>The University of Texas at Arlington, Arlington, TX, <sup>2</sup>The University of Texas Southwestern Medical Center at Dallas, Dallas, TX, <sup>3</sup>The University of Texas - Southwestern Medical Center at Dallas, Dallas, TX**PS-9A-6-81** Novel Enzyme Prodrug Therapy for Treatment of Breast CancerB. D. VAN RITE<sup>1</sup>, Y. A. LAZRAK<sup>1</sup>, M. PAGNON<sup>1</sup>, P. BOSE<sup>2</sup>, C. KURKJIAN<sup>2</sup>, V. I. SIKAVITSAS<sup>1</sup>, AND R. G. HARRISON<sup>1</sup><sup>1</sup>University of Oklahoma, Norman, OK, <sup>2</sup>University of Oklahoma Health Sciences Center, Oklahoma City, OK**PS-9A-6-82** Mechanical Compression Stimulates Coordinated Migration of Mammary Carcinoma CellsJ. M. TSE<sup>1,2</sup>, G. CHENG<sup>2</sup>, J. A. TYRRELL<sup>3</sup>, S. A. WILCOX-ADELMAN<sup>4</sup>, Y. BOUCHER<sup>2</sup>, R. K. JAIN<sup>2</sup>, AND L. L. MUNN<sup>2</sup><sup>1</sup>Massachusetts Institute of Technology, Cambridge, MA, <sup>2</sup>Massachusetts General Hospital, Charlestown, MA, <sup>3</sup>Thomson Reuters, Rochester, New York, <sup>4</sup>Boston Biomedical Research Institute, Watertown, MA**PS-9A-6-83** Study of Altered Metabolism due to Spherogenicity and Anoikis in Ovarian CancerC. A. CANEBA<sup>1</sup>, N. BELLANCE<sup>1</sup>, T. KAREDDATH<sup>1</sup>, P. RAMAKRISHNAN<sup>1</sup>, L. PABST<sup>1</sup>, S. A. HUSSAIN<sup>1</sup>, A. BOZHCHENKO<sup>1</sup>, AND D. NAGRATH<sup>1</sup><sup>1</sup>Rice University, Houston, TX

**Track: Devices: Nano to Micro – PS-9A-7****Emerging Concept of Medical Micro Devices****PS-9A-7-84 Modeling the Interaction Between Light and TiO<sub>2</sub> Thin Films in Photocatalytic Oxygen Generation**A. PERRIN<sup>1</sup>, S. M. MIJAILOVICH<sup>2</sup>, AND R. J. GILBERT<sup>3</sup><sup>1</sup>Caritas St. Elizabeth's Medical Center, Brighton, MA, <sup>2</sup>Harvard School of Public Health, Boston, MA, <sup>3</sup>Caritas St. Elizabeth's Medical Center, Boston, MA**PS-9A-7-85 Fiberoptic Microneedle Device for Laser Lipolysis**Y. CHEN<sup>1</sup>, M. A. KOSOGLU<sup>1</sup>, R. L. HOOD<sup>1</sup>, AND C. G. RYLANDER<sup>1</sup><sup>1</sup>Virginia Polytechnic Institute and State University, Blacksburg, VA**PS-9A-7-86 Real Time DNA Amplification Using a Novel Microfluidic Tablet Platform**S. ANGIONE<sup>1</sup>, J. LEE<sup>1</sup>, L. MERMEZ<sup>2</sup>, AND A. TRIPATHI<sup>1</sup><sup>1</sup>Brown University, Providence, RI, <sup>2</sup>Rhode Island Hospital, Providence, RI**PS-9A-7-87 Development of a High-Throughput Biofilm Chip for Accelerated Antifungal Drug Discovery**A. SRINIVASAN<sup>1</sup>, P. UPPULURI<sup>1</sup>, J. L. LOPEZ-RIBOT<sup>1</sup>, AND A. K. RAMASUBRAMANIAN<sup>1</sup><sup>1</sup>University of Texas at San Antonio, San Antonio, TX**PS-9A-7-88 A Finite Element Study of an Enveloped Biopsy Catheter in RF Tumor Ablation**P. GHANBARI-BAVARSAD<sup>1</sup>, AND R. L. MAHAJAN<sup>1</sup><sup>1</sup>Institute for Critical Technology and Applied Science, Blacksburg, VA**Track: Devices: Nano to Micro – PS-9A-8****Medical Diagnostics: Nano to Micro Devices****PS-9A-8-89 A Photodefined Micropatterned Membrane for Precise Cell Trapping**A. L. MCPHERSON<sup>1</sup>, AND G. M. WALKER<sup>1</sup><sup>1</sup>North Carolina State University, Raleigh, NC**PS-9A-8-90 BIO-MEMS Impedance Sensor for Detecting E.coli O57:H7**M. DWEIK<sup>1</sup><sup>1</sup>Lincoln University, Jefferson City, MO**PS-9A-8-91 Intensity-based Quantum Dot Barcode Identification Scheme towards Portable Disease Diagnostic Device**K. MING<sup>1</sup>, AND W. CHAN<sup>1</sup><sup>1</sup>University of Toronto, Toronto, Ontario, Canada**PS-9A-8-92 Bioanalytical Applications Using a Silicon-nanowire Drop-based Magnetic Microfluidic Platform**A. EGATZ-GOMEZ<sup>1</sup><sup>1</sup>Texas A&M University TEES, College Station, TX**PS-9A-8-93 Progress in the Development of a Wireless Stimulator for Gastroparesis**S. DEB<sup>1</sup>, T. ABELL<sup>2</sup>, W-D. HUANG<sup>1</sup>, C. LAHR<sup>3</sup>, AND J-C. CHIAO<sup>1</sup><sup>1</sup>University of Texas at Arlington, Arlington, TX, <sup>2</sup>University of Mississippi Medical Center, Jackson, MS, <sup>3</sup>University of Mississippi Medical Center, Jackson, MS**PS-9A-8-94 The Design of a Wireless System Based on MSP430 Microcontroller for Multiple Parameter Sensing in Biomedical Applications**Y-S. SEO<sup>1</sup>, W-D. HUANG<sup>1</sup>, AND J-C. CHIAO<sup>1</sup><sup>1</sup>University of Texas at Arlington, Arlington, TX**PS-9A-8-95 Electrical and Paper Based Point of Care Diagnostic Devices for Rapid Pathogenic Bacteria Detection**E. HONDRULIS<sup>1</sup>, C. LIU<sup>1</sup>, AND C-Z. LI<sup>1</sup><sup>1</sup>Florida International University, Miami, FL**PS-9A-8-96 Microfluidic Endothelial Progenitor Cell Capture Technology for Cardiovascular Diagnostic Medicine**B. D. PLOUFFE<sup>1</sup>, G. HANSMANN<sup>2,3</sup>, AND S. K. MURTHY<sup>1</sup><sup>1</sup>Northeastern University, Boston, MA, <sup>2</sup>Children's Hospital Boston, Boston, MA, <sup>3</sup>Harvard Medical School, Boston, MA**PS-9A-8-97 Volatile Alkanes Micro Preconcentration for Breath Analysis Based Cancer Screening**B. ALFEELI<sup>1</sup>, AND M. AGAH<sup>1</sup><sup>1</sup>Virginia Tech, Blacksburg, VA**PS-9A-8-98 In Vivo Transdermal SERS Glucose Measurements Using Spatially Offset Raman Spectroscopy**J. M. YUEN<sup>1</sup>, R. P. VAN DUYN<sup>1</sup>, J. T. WALSH<sup>1</sup>, AND M. R. GLUCKSBERG<sup>1</sup><sup>1</sup>Northwestern University, Evanston, IL**PS-9A-8-99 Development of a Microfluidic Reactor for Influenza A Subtyping**S. E. MCCALLA<sup>1</sup>, A. SARMA<sup>2</sup>, C. ONG<sup>1</sup>, S. M. OPAL<sup>3</sup>, A. W. ARTENSTEIN<sup>4</sup>, AND A. TRIPATHI<sup>1</sup><sup>1</sup>Brown University, Providence, RI, <sup>2</sup>Harvard University, Cambridge, MA, <sup>3</sup>Rhode Island Hospital, Providence, RI, <sup>4</sup>Memorial Hospital of Rhode Island, Pawtucket, RI**PS-9A-8-100 Disruption of Radial Flow in an Evaporating Drop as a Visual Indicator of Infection**J. TRANTUM<sup>1</sup>, R. L. MERNAUGH<sup>1</sup>, D. W. WRIGHT<sup>1</sup>, AND F. R. HASELTON<sup>1</sup><sup>1</sup>Vanderbilt University, Nashville, TN**PS-9A-8-101 One-step Extraction of Nucleic Acids from Clinical Samples**H. BORDELON<sup>1</sup>, N. ADAMS<sup>1</sup>, A. KLEMM<sup>1</sup>, P. RUSS<sup>1</sup>, J. WILLIAMS<sup>1</sup>, D. WRIGHT<sup>1</sup>, AND F. R. HASELTON<sup>1</sup><sup>1</sup>Vanderbilt University, Nashville, TN**PS-9A-8-102 Development of a Novel Nano-Biosensor Chip Based on Surface Plasmon Resonance for Rapid Medical Diagnostics**M. VENKATARAMASUBRAMANIAN<sup>1</sup>, AND L. TANG<sup>1</sup><sup>1</sup>University Of Texas at San Antonio, San Antonio, TX**PS-9A-8-103 Quantitative Characterization of Microelectroporated T cells Using Flow Cytometry**D. J. STARK<sup>1</sup>, T. C. KILLIAN<sup>1</sup>, AND R. M. RAPHAEL<sup>1</sup><sup>1</sup>Rice University, Houston, TX**PS-9A-8-104 Optically Forced Cytometry (OFC) for In Situ Bio-nano-particle Enumeration**Y. HU<sup>1</sup>, D. OU-YANG<sup>1</sup>, AND X. CHENG<sup>1</sup><sup>1</sup>Lehigh University, Bethlehem, PA**PS-9A-8-105 Towards Non-Invasive Breath Monitoring with Microsensor Arrays**B. RAMAN<sup>1</sup>, K. BENKSTEIN<sup>2</sup>, C. MUNGLE<sup>2</sup>, C. MONTGOMERY<sup>2</sup>, C. J. MARTINEZ<sup>3</sup>, AND S. SEMANCIK<sup>2</sup><sup>1</sup>Washington University, St. Louis, MO, <sup>2</sup>National Institutes of Standards and Technology, Gaithersburg, Maryland, <sup>3</sup>Purdue University, West Lafayette, IN**PS-9A-8-106 Rapid In-Field Detection of Viral Bioterrorism Agents via Complex Fluid Systems**F. MASHAYEKHI<sup>1</sup>, Y. T. CHIU<sup>1</sup>, A. LE<sup>1</sup>, F. C. CHAO<sup>1</sup>, B. M. WU<sup>1</sup>, AND D. T. KAMEI<sup>1</sup><sup>1</sup>UCLA, Los Angeles, CA**PS-9A-8-107 An Asynchronous Magnetic Bead Rotation Assay: A magnetic Torque-based Biosensor**A. H. HECHT<sup>1</sup>, P. KINNUNEN<sup>1</sup>, B. MCNAUGHTON<sup>1</sup>, AND R. KOPELMAN<sup>1</sup><sup>1</sup>University of Michigan, Ann Arbor, MI



**PS-9A-8-108** High Density Multiplexed Microfluidic Platforms for Rapid, Informative Plasma Protein Detection in Cancer DiagnosticsO. VERMESH<sup>1,2</sup>, AND U. VERMESH<sup>1</sup><sup>1</sup>California Institute of Technology, Pasadena, CA, <sup>2</sup>The David Geffen School of Medicine at UCLA, Los Angeles, CA**PS-9A-8-109** Lab-on-chip Sensor for Monitoring Zinc by Anodic Stripping VoltammetryJ. L. HERREN<sup>1</sup>, P. JOTHIMUTHU<sup>1</sup>, R. A. WILSON<sup>1</sup>, H. WONG<sup>2</sup>, W. R. HEINEMAN<sup>1</sup>, AND I. PAPAUTSKY<sup>1</sup><sup>1</sup>University of Cincinnati, Cincinnati, OH, <sup>2</sup>Cincinnati Childrens Hospital Medical Center, Cincinnati, OH**PS-9A-8-110** Multiplexed, Rapid, Point of Care Device to Quantify Allergen-Specific IgEM. R. MONROE<sup>1</sup>, G. DAABOUL<sup>1</sup>, A. REDDINGTON<sup>1</sup>, S. UNLU<sup>1</sup>, AND F. LITTLE<sup>1</sup><sup>1</sup>Boston University, Boston, MA**PS-9A-8-111** Device For Minimally Invasive Non-Destructive Analysis of Local Tissue BiomechanicsR. A. GOULD<sup>1</sup>, G. TARSİ<sup>1</sup>, A. BOZKURT<sup>1</sup>, AND J. BUTCHER<sup>1</sup><sup>1</sup>Cornell University, Ithaca, NY**PS-9A-8-112** Enhancing MRI Contrast of Fe<sub>3</sub>O<sub>4</sub> Nanoparticles via Porous Si EntrapmentJ. M. KINSELLA<sup>1</sup>, S. ANANDA<sup>1</sup>, AND M. SAILOR<sup>1</sup><sup>1</sup>University of California, San Diego, La Jolla, CA**PS-9A-8-113** Biomimetic Separation of Blood Cells on a Microfluidic PlatformA. JAIN<sup>1,2</sup>, AND L. MUNN<sup>1</sup><sup>1</sup>Massachusetts General Hospital, Charlestown, MA, <sup>2</sup>Boston University, Boston, MA**PS-9A-8-114** Quantum Dot-Microbeads for Genetic Detection in Non-Amplified DNA SamplesY. GAO<sup>1</sup>, W. L. STANFORD<sup>1</sup>, AND W. C. CHAN<sup>1</sup><sup>1</sup>University of Toronto, Toronto, ON, Canada**PS-9A-8-115** An Intracranial Volume Sensor to Monitor Ventricular EnlargementS. BASATI<sup>1</sup>, M. LARIVIERE<sup>2</sup>, R. PENN<sup>1</sup>, AND A. LINNINGER<sup>1</sup><sup>1</sup>University of Illinois at Chicago, Chicago, IL, <sup>2</sup>University of Chicago, Chicago, IL**Track: Drug Delivery Systems – PS-9A-9****Graduate Education****PS-9A-9-116** Purification of Bacterial APOA-I and Characterization of Novel Anticancer Drug Delivery SystemT. YOUNG<sup>1</sup>, AND A. G. LACKO<sup>2</sup><sup>1</sup>North Carolina State, Raleigh, NC, <sup>2</sup>University of North Texas Health Science Center, Fort Worth, TX**Track: Drug Delivery Systems – PS-9A-10****Nucleic Acid Delivery****PS-9A-10-117** Preparation and Characterization of PEI-PEG attached Silica Nanoparticles for siRNA DeliveryH. LEE<sup>1</sup>, D. SUNG<sup>1</sup>, AND S-W. SEO<sup>1</sup><sup>1</sup>Biomedical Engineering Interdisciplinary program, School of Medicine, Sungkyunkwan University, Seoul, Korea, Republic of**PS-9A-10-118** Towards the Development of Mucus Penetrating DNA NanoparticlesN. BOYLAN<sup>1</sup>, J. SUK<sup>2</sup>, S. LAI<sup>1,3</sup>, R. JELINEK<sup>4</sup>, M. BOYLE<sup>2</sup>, AND J. HANES<sup>3,5</sup><sup>1</sup>The Johns Hopkins University, Baltimore, MD, <sup>2</sup>The Johns Hopkins University School of Medicine, Baltimore, MD, <sup>3</sup>Institute for NanoBioTechnology, Baltimore, MD, <sup>4</sup>Ben-Gurion University, Beersheba, Israel, <sup>5</sup>Wilmer Ophthalmological Institute, The Johns Hopkins University School of Medicine, Baltimore, MD**PS-9A-10-119** Development of Smart Particles for Effective Gene Silencing in Head & Neck CancerY-L. LIN<sup>1</sup>, G. JIANG<sup>1</sup>, AND M. E.H. EL-SAYED<sup>1</sup><sup>1</sup>University of Michigan, Ann Arbor, MI**PS-9A-10-120** Understanding the Selective Transfection Mediated by Pentablock Copolymers with Study on Rate Limiting StepsB. ZHANG<sup>1</sup>, AND S. K. MALLAPRAGADA<sup>1</sup><sup>1</sup>Iowa State University, Ames, IA**PS-9A-10-121** Gene Expression Profiling of Cells Transfected with Nonviral VectorsS. A. PLAUTZ<sup>1</sup>, G. BOANCA<sup>1</sup>, J-J. M. RIETHOVEN<sup>1</sup>, AND A. K. PANNIER<sup>1</sup><sup>1</sup>University of Nebraska-Lincoln, Lincoln, NE**PS-9A-10-122** Small Molecular Changes to Gene Delivery Polymers Varies Transfection Efficacy Between 2D and 3DN. S. BHISE<sup>1</sup>, R. GRAY<sup>1</sup>, J. SUNSHINE<sup>1</sup>, S. HTET<sup>1</sup>, J. GREEN<sup>1</sup>, AND A. EWALD<sup>1</sup><sup>1</sup>Johns Hopkins School of Medicine, Baltimore, MD**PS-9A-10-123** The Role of Endocytosis in the Uptake and Internalization of Plasmid DNA Following ElectroporationM. WU<sup>1</sup>, AND F. YUAN<sup>1</sup><sup>1</sup>Duke University, Durham, NC**PS-9A-10-124** Conjugation of Nucleic Acids to Gold Nanorods for Site-specific Delivery Using Photothermal ReleaseT. A. LARSON<sup>1</sup>, S. CHIRIELEISON<sup>1</sup>, A. ELLINGTON<sup>1</sup>, AND K. SOKOLOV<sup>1,2</sup><sup>1</sup>UT Austin, Austin, TX, <sup>2</sup>MD Anderson Cancer Center, Houston, TX**PS-9A-10-125** Novel Block Copolypeptide Vesicles as Potential Transfection AgentsU-J. CHOE<sup>1</sup>, V. Z. SUN<sup>1</sup>, A. R. RODRIGUEZ<sup>1</sup>, H. DAI<sup>1</sup>, T. J. DEMING<sup>1</sup>, AND D. T. KAMEI<sup>1</sup><sup>1</sup>UCLA, Los Angeles, CA**PS-9A-10-126** Intramyocardial Delivery of Functionalized Nanoparticles for Cardioprotection after InfarctionM. CHENG<sup>1,2</sup>, C. CHANG<sup>1</sup>, W. LIAO<sup>2</sup>, A. TANG<sup>2</sup>, C. YEH<sup>3</sup>, Y. YANG<sup>4</sup>, AND P. HSIEH<sup>5</sup><sup>1</sup>Biomedical Engineering, Tainan, Taiwan, Taiwan, <sup>2</sup>Clinical Medicine & Research Center of Clinical Medicine, Tainan, Taiwan, Taiwan, <sup>3</sup>Chemistry, Tainan, Taiwan, Taiwan, <sup>4</sup>Surgery, Tainan, Taiwan, Taiwan, <sup>5</sup>Biomedical Sciences, Academia Sinica, Taipei, Taiwan, Taiwan**PS-9A-10-127** Functional Performance of Polyplexes Self-assembled in Microfluidics-generated DropletsC. L. GRIGSBY<sup>1</sup>, Y-P. HO<sup>1</sup>, AND K. W. LEONG<sup>1</sup><sup>1</sup>Duke University, Durham, NC**PS-9A-10-128** In Vivo Gene Delivery with Biodegrading NanoparticlesA. J. DITTO<sup>1</sup>, J. J. REHO<sup>1</sup>, J. A. SMOLEN<sup>1</sup>, J. H. HOLDA<sup>1</sup>, R. J. RAMIREZ<sup>1</sup>, AND Y. H. YUN<sup>1</sup><sup>1</sup>University of Akron, Akron, OH**PS-9A-10-129** Synthesis and Biological Evaluation of Multifunctional Peptide-HPMA Copolymers as Nucleic Acid Delivery VehiclesR. N. JOHNSON<sup>1</sup>, J. SHI<sup>1</sup>, R. BURKE<sup>1</sup>, A. HOFFMAN<sup>1</sup>, P. STAYTON<sup>1</sup>, AND S. H. PUN<sup>1</sup><sup>1</sup>University of Washington, Seattle, WA**PS-9A-10-130** Apoptosis of Human Colon Cancer Cells by Silencing Eukaryotic Translation Initiation Factor 2 AlphaC-H. WANG<sup>1</sup>, AND C-A. PENG<sup>1</sup><sup>1</sup>Michigan Technological University, Houghton, MI**PS-9A-10-131** The Effect of Swelling and Cationic Character On Gene Transfection by pH-Responsive NanocarriersJ-O. YOU<sup>1</sup>, R. E. HORTON<sup>1</sup>, AND D. T. AUGUSTE<sup>1</sup><sup>1</sup>Harvard University, Cambridge, MA**PS-9A-10-132** Well-defined Synthetic Polymers for DNA Vaccine Delivery: Uptake and Subcellular Trafficking in Dendritic CellsD. PANUS<sup>1</sup>, W. JI<sup>1</sup>, AND C. WANG<sup>1</sup><sup>1</sup>University of Minnesota, Minneapolis, MN

**Track: Neural Engineering – PS-9A-11****Neural Engineering: Technology Development****PS-9A-11-133 Laser Suppresses Amyloid-beta Peptide-induced ROS and Inflammation in Primary Astrocytes**X. YANG<sup>1</sup>, S. ASKAROVA<sup>1</sup>, W. SHENG<sup>1</sup>, G. YAO<sup>1</sup>, G. SUN<sup>1</sup>, AND J. LEE<sup>1</sup><sup>1</sup>University of Missouri, Columbia, MO**PS-9A-11-134 The Effects of Substrate Rigidity on Neuronal Precursor Cells**M. L. PREVITERA<sup>1</sup>, M. HUI<sup>1</sup>, M. S. DESAI<sup>1</sup>, D. VERMA<sup>1</sup>, R. S. SCHLOSS<sup>1</sup>, AND N. A. LANGRANA<sup>1</sup><sup>1</sup>Rutgers University, Piscataway, NJ**PS-9A-11-135 Poly(3,4-ethylene dioxythiophene) Enables 38.5 μm<sup>2</sup> Recording Site for Carbon Fiber Based Electrodes**T. D. KOZAI<sup>1</sup>, P. R. PATEL<sup>1</sup>, N. B. LANGHALS<sup>1</sup>, X. DENG<sup>1</sup>, H. ZHANG<sup>1</sup>, J. LAHANN<sup>1</sup>, N. A. KOTOV<sup>1</sup>, AND D. R. KIPKE<sup>1</sup><sup>1</sup>University of Michigan, Ann Arbor, MI**PS-9A-11-136 An Integrated Probe for Sensing Neurotransmitters**H. CAO<sup>1</sup>, Y-B. PENG<sup>1</sup>, AND J-C. CHIAO<sup>1</sup><sup>1</sup>University of Texas at Arlington, Arlington, TX**PS-9A-11-137 Investigating the Power Spectral Density as a Method for Quantifying Neuronal Signals for Pain Study**A. FARAJIDAVAR<sup>1</sup>, C. HAGAINS<sup>1</sup>, Y. PENG<sup>1</sup>, AND J-C. CHIAO<sup>1</sup><sup>1</sup>THE UNIVERSITY OF TEXAS AT ARLINGTON, ARLINGTON, TX**PS-9A-11-138 Aqueous Micro-contact Printing for Design of Live Neuronal Network In Vitro**M. J. JANG<sup>1</sup>, AND Y. NAM<sup>1</sup><sup>1</sup>KAIST, Daejeon, Chungnam, Korea, Republic of**PS-9A-11-139 A Preliminary Study of Motor Unit Discrimination from Surface EMG Using EMGLAB**F. J. NEZHAD<sup>1</sup>, X. LI<sup>1</sup>, W. Z. RYMER<sup>1,2</sup>, AND P. ZHOU<sup>1,2</sup><sup>1</sup>Rehabilitation Institute of Chicago, Chicago, IL, <sup>2</sup>Northwestern University, Chicago, IL**PS-9A-11-140 In Vitro stability and In Vivo performance of PEDOT coatings for neural microstimulation**S. J. WILKS<sup>1</sup>, A. S. KOIVUNIEMI<sup>1,2</sup>, AND K. J. OTTO<sup>1</sup><sup>1</sup>Purdue University, West Lafayette, IN, <sup>2</sup>Indiana University, Indianapolis, IN**PS-9A-11-141 Improving the Assessment of Tremor and Bradykinesia Using the Tablet PC**M. ZHANG<sup>1</sup>, S. ASKARI<sup>1</sup>, AND D. S. WON<sup>1</sup><sup>1</sup>California State University, Los Angeles, Los Angeles, CA**PS-9A-11-142 Impulsive Pressurization of Neuronal Cells for Studying Traumatic Brain Injury**J. LEE<sup>1</sup>, M. NIENABER<sup>1</sup>, R. FENG<sup>1</sup>, AND J. LIM<sup>1</sup><sup>1</sup>University of Nebraska, Lincoln, NE**PS-9A-11-143 Development of a High-Throughput Screen for Novel Biomaterials in Neural Tissue Engineering**C. DUMONT<sup>1</sup>, P. KARANDE<sup>1</sup>, AND D. THOMPSON<sup>1</sup><sup>1</sup>Rensselaer Polytechnic Institute, Troy, NY**PS-9A-11-144 3-D Integrated Neuromorphic Processor**J. PARK<sup>1</sup>, T. YU<sup>1,2</sup>, S. JOSHI<sup>1</sup>, AND G. CAUWENBERGHS<sup>1,2</sup><sup>1</sup>UCSD, La Jolla, CA, <sup>2</sup>Institute of Neural Computation, La Jolla, CA**PS-9A-11-145 Tape-Transfer Assisted Cryosectioning for the Mouse Brain Architecture Project**V. PINSKIY<sup>1,2</sup>, J. JONES<sup>1</sup>, H. WANG<sup>1</sup>, H. COX<sup>1</sup>, AND P. MITRA<sup>1</sup><sup>1</sup>Cold Spring Harbor Laboratory, Cold Spring Harbor, NY, <sup>2</sup>Stony Brook University, Stony Brook, NY**PS-9A-11-146 Development of Mental Fatigue in Simulated Air Traffic Control Tasks Studied by EEG**D. DASARI<sup>1</sup>, C. CROWE<sup>1</sup>, C. LING<sup>1</sup>, M. ZHU<sup>1</sup>, L. BAILEY<sup>2</sup>, J. CRUTCHFIELD<sup>2</sup>, AND L. DING<sup>1</sup><sup>1</sup>University of Oklahoma, Norman, OK, <sup>2</sup>Federal Aviation Academy, Oklahoma City, OK**PS-9A-11-147 Improved Modeling and Application of Transcranial Magnetic Stimulation**T. KRIEG<sup>1</sup>, AND D. MOGUL<sup>1</sup><sup>1</sup>Illinois Institute of Technology, Chicago, IL**PS-9A-11-148 Monitoring the Depth of Anesthesia using the Time-Varying Spectral Features of EEG**E. E. KANG<sup>1</sup>, H. EL BEHEIRY<sup>1,2</sup>, J. WONG<sup>3</sup>, M. DEL CAMPO<sup>3</sup>, P. L. CARLEN<sup>1,3</sup>, AND B. L. BARDAKJIAN<sup>1</sup><sup>1</sup>University of Toronto, Toronto, Ontario, Canada, <sup>2</sup>Trillium Health Centre, Toronto, Ontario, Canada, <sup>3</sup>University Health Network, Toronto, Ontario, Canada**PS-9A-11-149 Electrical High Frequency Nerve Block of the Urethral Sphincter for Bladder Voiding**M. FRANKE<sup>1,2</sup>, A. S. BOGER<sup>1,2</sup>, N. BHADRA<sup>1,2</sup>, AND K. J. GUSTAFSON<sup>1,2</sup><sup>1</sup>Case Western Reserve University, Cleveland, OH, <sup>2</sup>Louis Stokes VA Medical Center, Cleveland, OH**PS-9A-11-150 A FPGA-based Sound Classification and Localization System That Uses Output From a Biomimetic Model**Y. PU<sup>1</sup>, L. SOLOMON<sup>2</sup>, AND A. HUBBARD<sup>1</sup><sup>1</sup>Boston University, Boston, MA, <sup>2</sup>US Army Research Laboratory, Adelphi, MD**PS-9A-11-151 Methodology and Characteristics of Micropatterned Neural Networks**E. W. FRANCA<sup>1</sup>, S. ALGAPAN<sup>1</sup>, L. PAN<sup>1</sup>, K. VARGHESE<sup>1</sup>, G. J. BREWER<sup>2</sup>, AND B. WHEELER<sup>1</sup><sup>1</sup>University of Florida, Gainesville, FL, <sup>2</sup>Southern Illinois University School of Medicine, Springfield, IL**PS-9A-11-152 IV Administered Copolymer Surfactant Poloxamer 188 Accelerates Peripheral Axon Regeneration**R. C. LEE<sup>1</sup><sup>1</sup>University of Chicago, Chicago, IL**PS-9A-11-153 Carbon Nanotube Thread Supports Attachment and Differentiation of Murine Neural Cells in Culture**T. HOPKINS<sup>1</sup>, J. VENNEMEYER<sup>1</sup>, C. JAYASINGHE<sup>1</sup>, V. SHANOV<sup>1</sup>, AND S. PIXLEY<sup>1</sup><sup>1</sup>University of Cincinnati, Cincinnati, OH**PS-9A-11-154 Novel Microchannel Device for Real Time Monitoring Tumor Cell Migration**S. VASUDEVAN<sup>1</sup>, D. TAMULY<sup>1</sup>, D. P. DAVE<sup>1</sup>, S. M. IQBAL<sup>1</sup>, R. BACHOO<sup>2</sup>, AND Y-T. KIM<sup>1</sup><sup>1</sup>University of Texas at Arlington, Arlington, TX, <sup>2</sup>University of Texas Southwestern Medical Center, Dallas, TX**Track: New Frontiers in Bioengineering – PS-9A-12****Synthetic Biology in Health and Medicine****PS-9A-12-155 Improved Safety and Efficacy of Balloon Angioplasty Procedures Using Collagen-Binding Peptidoglycans**K. STUART<sup>1</sup>, J. PADERI<sup>1</sup>, M. STUREK<sup>2</sup>, AND A. PANITCH<sup>1</sup><sup>1</sup>Purdue University, West Lafayette, IN, <sup>2</sup>Indiana University School of Medicine, Indianapolis, IN**PS-9A-12-156 A Synthetic Biological Engineering Approach to Secretion-Based Recovery of Polyhydroxyalkanoates and Other Cellular Products**E. LINTON<sup>1</sup>, R. C. SIMS<sup>1</sup>, AND C. D. MILLER<sup>1</sup><sup>1</sup>Utah State University, Logan, UTPS = Poster Session  
OP = Oral Presentation

**PS-9A-12-157 A Temperature-Responsive Synthetic Antibody for Reversible Cell Labeling**J. ZHOU<sup>1</sup>, B. SOONTORNWORAJIT<sup>1</sup>, AND Y. WANG<sup>1</sup><sup>1</sup>University of Connecticut, Storrs, CT**PS-9A-12-158 Self-assembling Peptides as Chemically Defined Adjuvants**J. S. RUDRA<sup>1</sup>, Y. F. TIAN<sup>1</sup>, J. P. JUNG<sup>1</sup>, AND J. H. COLLIER<sup>1</sup><sup>1</sup>University of Chicago, Chicago, IL**PS-9A-12-159 Tunable Signal Processing in Synthetic MAP Kinase Modules**E. C. O'SHAUGHNESSY<sup>1</sup>, S. PALANI<sup>2</sup>, J. J. COLLINS<sup>1</sup>, AND C. A. SARKAR<sup>2</sup><sup>1</sup>Howard Hughes Medical Institute and Boston University, Boston, MA, <sup>2</sup>University of Pennsylvania, Philadelphia, PA**Track: Orthopedic and Rehabilitation Engineering – PS-9A-13****Orthopaedic Hard Tissue Biomechanics****PS-9A-13-160 Effect of Plate Size on the Stability of Surgically Repaired Humeri in Simulated Crutch Ambulation**J. G. BLEDSOE<sup>1</sup>, J. BUCHHEIT<sup>1</sup>, S. OWEN<sup>1</sup>, AND L. CANNADA<sup>1</sup><sup>1</sup>Saint Louis University, St Louis, MO**PS-9A-13-161 Factors Influencing Tibial Loading Following Total Knee Arthroplasty: A Finite Element Study**S. TOKUNAGA<sup>1</sup>, S. R. SMALL<sup>2</sup>, R. D. ROGGE<sup>1</sup>, M. E. BEREND<sup>2</sup>, AND M. A. RITTER<sup>2</sup><sup>1</sup>Rose-Hulman Institute of Technology, Terre Haute, IN, <sup>2</sup>JRSI Foundation, Inc., Mooresville, IN**PS-9A-13-162 Understanding Nanotopography Mediated Osteoblast Responses by Experiments and Mathematical Modeling**L. YANG<sup>1</sup>, V. CHINTHAPENTA<sup>1</sup>, Q. LI<sup>1</sup>, B. W. SHELDON<sup>1</sup>, AND T. J. WEBSTER<sup>1</sup><sup>1</sup>Brown University, Providence, RI**PS-9A-13-163 A Mechanistic Model of the Nanoscratch Test to Determine the In Situ Toughness of Bone**A. ISLAM<sup>1</sup>, X. DONG<sup>1</sup>, AND X. WANG<sup>1</sup><sup>1</sup>University of Texas at San Antonio, San Antonio, TX**PS-9A-13-164 Microdamage Induced Collagen Denaturation in Bone**M. BANKA<sup>1</sup>, M. APPLEFORD<sup>1</sup>, AND X. WANG<sup>1</sup><sup>1</sup>University of Texas at San Antonio, San Antonio, TX**PS-9A-13-165 High Initial Stability in Porous Titanium Acetabular Cup Designs: A Biomechanical Study**M. E. BEREND<sup>1</sup>, S. R. SMALL<sup>1</sup>, L. HOWARD<sup>2</sup>, R. D. ROGGE<sup>2</sup>, C. A. BUCKLEY<sup>2</sup>, AND M. A. RITTER<sup>1</sup><sup>1</sup>JRSI Foundation, Inc., Mooresville, IN, <sup>2</sup>Rose-Hulman Institute of Technology, Terre Haute, IN**PS-9A-13-166 The role of Osteocalcin and Osteopontin in Fatigue Induced Microdamage Formation and Morphology**O. NIKEL<sup>1</sup>, R. A. DAVIGNON<sup>1</sup>, C. M. GUNDBERG<sup>2</sup>, AND D. VASHISHTH<sup>1</sup><sup>1</sup>Rensselaer Polytechnic Institute, Troy, NY, <sup>2</sup>Yale School of Medicine, New Haven, CT**PS-9A-13-167 An Inverse FEA to Assess Bone Fracture Healing in Mice Receiving Mesenchymal Stem Cell Transplantation**J. A. WEIS<sup>1</sup>, F. GRANERO-MOLTÓ<sup>2</sup>, T. J. MYERS<sup>2</sup>, A. SPAGNOLI<sup>2</sup>, AND M. I. MIGA<sup>1</sup><sup>1</sup>Vanderbilt University, Nashville, TN, <sup>2</sup>University of North Carolina at Chapel Hill, Chapel Hill, NC**PS-9A-13-168 The Influence of the Frontal Sinus on Fracture Tolerance**J. CORMIER<sup>1</sup>, S. MANOOGIAN<sup>1</sup>, J. BISPLINGHOFF<sup>2</sup>, S. ROWSON<sup>2</sup>, A. SANTAGO<sup>2</sup>, C. MCNALLY<sup>2</sup>, J. BOLTE IV<sup>3</sup>, AND S. DUMA<sup>2</sup><sup>1</sup>Biodynamic Research, San Antonio, TX, <sup>2</sup>Virginia Tech – Wake Forest Center for Injury Biomechanics, Blacksburg, VA, <sup>3</sup>The Ohio State University Transportation Research Center, Columbus, OH**PS-9A-13-169T The Tolerance of the Nasal Bone to Blunt Impact**J. CORMIER<sup>1</sup>, S. MANOOGIAN<sup>1</sup>, J. BISPLINGHOFF<sup>2</sup>, S. ROWSON<sup>2</sup>, A. SANTAGO<sup>2</sup>, C. MCNALLY<sup>2</sup>, J. BOLTE IV<sup>3</sup>, AND S. DUMA<sup>2</sup><sup>1</sup>Biodynamic Research, San Antonio, TX, <sup>2</sup>Virginia Tech – Wake Forest Center for Injury Biomechanics, Blacksburg, VA, <sup>3</sup>The Ohio State University Transportation Research Center, Columbus, OH**PS-9A-13-170 Variation of Mineral Crystal Orientation Under Uniaxial Load Using Synchrotron X-Ray Scattering**A. R. PATERSON<sup>1</sup>, A. BELZUNG<sup>2</sup>, X. DONG<sup>2</sup>, J. ALMER<sup>3</sup>, AND X. WANG<sup>2</sup><sup>1</sup>University of Texas at San Antonio, San Antonio, TX, <sup>2</sup>UTSA, San Antonio, TX, <sup>3</sup>Argonne National Lab, Advanced Photon Source, Argonne, IL**Track: Respiratory Engineering – PS-9A-14****Upper Airway Function****PS-9A-14-171 Modeling of Adhesion Dynamics and Eustachian Tube Function During Inflammatory Otitis Media**F. J. SHEER<sup>1</sup>, AND S. GHADIALI<sup>1</sup><sup>1</sup>Ohio State University, Columbus, OH**PS-9A-14-172 Real-Time Monitoring of Exercise Induced Changes in Respiratory Resistance Using the Airflow Perturbation Device**P. CHAPAIN<sup>1,2</sup>, A. JOHNSON<sup>1</sup>, J. VOSSOUGHT<sup>2</sup>, AND S. MAJD<sup>2</sup><sup>1</sup>University of Maryland College Park, College Park, MD, <sup>2</sup>Engineering and Scientific Research Associates, Olney, MD**PS-9A-14-173 In Vivo Detection of Airway Narrowing and Occlusion in Obstructive Sleep Apnea/Hypopnea using Ultrasound**M. AL-ABED<sup>1</sup>, P. ANTICH<sup>2</sup>, D. E. WATENPAUGH<sup>3</sup>, G. BHAVE<sup>1</sup>, A. BASHABOYINA<sup>1</sup>, R. ALEX<sup>1</sup>, S. IYER<sup>1</sup>, E. ALTUWAJRI<sup>1</sup>, AND K. BEHBEHANI<sup>1</sup><sup>1</sup>University of Texas at Arlington, Arlington, TX, <sup>2</sup>University of Texas Southwestern Medical Center at Dallas, Dallas, TX, <sup>3</sup>Sleep Consultants, Inc., Fort Worth, TX**PS-9A-14-174 Odorant Uptake and Transport in the Human Nasal Nose Under Unsteady Airflow**J. JIANG<sup>1</sup>, AND K. ZHAO<sup>1</sup><sup>1</sup>Monell Chemical Sense Center, Philadelphia, PA**PS-9A-14-175 A Study of Physiological Effects of Sleep Apnea on Cerebral Blood Flow Velocity**G. BHAVE<sup>1</sup>, D. E. WATENPAUGH<sup>2</sup>, R. ZHANG<sup>3</sup>, A. BASHABOYINA<sup>4</sup>, M. AL-ABED<sup>1</sup>, S. IYER<sup>5</sup>, E. ALTUWAJRI<sup>1</sup>, AND K. . BEHBEHANI<sup>1</sup><sup>1</sup>The University of Texas, Arlington, Arlington, TX, <sup>2</sup>Sleep Consultants Inc., Ft. Worth, TX, <sup>3</sup>Presbyterian Hospital, Institute for Exercise and Environmental Medicine, Dallas, TX,**PS-9A-14-176 A Pressure Measuring Syringe**J. SPIEGEL<sup>1</sup><sup>1</sup>BIDMC, Natick, MA**Track: Systems Biology, Bioinformatics and Computational Biology – PS-9A-15****Systems Cell Biology****PS-9A-15-177 Bioinformatic Elucidation of Consensus Phosphorylation Motifs Utilizing Inter-Species Functional Data**L. BRUMFIELD<sup>1</sup><sup>1</sup>NC State University, Raleigh, NC**PS-9A-15-178 Systems Analysis of NoxI Activation by Angiotensin II in Vascular Smooth Muscle Cells**W. YIN<sup>1</sup>, AND E. O. VOIT<sup>1</sup><sup>1</sup>Georgia Institute of Technology, Atlanta, GA**PS-9A-15-179 Modeling of Potassium Accumulation at the Immunological Synapse and its Effect on T-cell Function**G. MARTIN<sup>1</sup>, Y. YUN<sup>2</sup>, AND L. CONFORTI<sup>1</sup><sup>1</sup>University of Cincinnati, Cincinnati, OH, <sup>2</sup>North Carolina A&T State University, Greensboro, NC

**PS-9A-15-180** Design of an Ultrasensitive Activity Assay for Protein-Kinase Signaling NetworksK. J. HOLMBERG<sup>1</sup>, AND K. A. JANES<sup>1</sup><sup>1</sup>University of Virginia, Charlottesville, VA**PS-9A-15-181** Silver Salts: Effective Antibiotic PotentiatorsJ. R. MORONES-RAMIREZ<sup>1,2</sup>, AND J. J. COLLINS<sup>1,2</sup><sup>1</sup>Howard Hughes Medical Institute, Boston, MA, <sup>2</sup>Boston University, Boston, MA**PS-9A-15-182** Quantitative Signaling Analysis of Monocyte Differentiation into Osteoclasts or MacrophagesM. O. PLATT<sup>1</sup>, AND W. A. LI<sup>1</sup><sup>1</sup>Georgia Institute of Technology, Atlanta, GA**PS-9A-15-183** Toward Automated Quantitative Analysis of Macrophage Activation While Retaining Spatial ContextE. HIGHLEY<sup>1</sup>, S. Y. KWAN<sup>1</sup>, AND P. G. CAMPBELL<sup>1</sup><sup>1</sup>Carnegie Mellon University, Pittsburgh, PA**PS-9A-15-184** A Computational Toolbox to Analyze *In-Vitro* Cell Differentiation HeterogeneityE. HIGHLEY<sup>1</sup>, E. KER<sup>1</sup>, L. E. WEISS<sup>1</sup>, AND P. G. CAMPBELL<sup>1</sup><sup>1</sup>Carnegie Mellon University, Pittsburgh, PA**PS-9A-15-185** Temporal Changes in ERK1/2 Signaling in Huvecs Cultured on Combinations of ECM ComponentsC. PAUKEN<sup>1</sup>, AND M. CAPLAN<sup>1</sup><sup>1</sup>Arizona State University, Tempe, AZ**PS-9A-15-186** Spatial Dynamics of TNF- $\alpha$  Induced Hydrogen PeroxideA. F. GARDEZI<sup>1</sup>, AND M. L. KEMP<sup>2</sup><sup>1</sup>Georgia Institute of Technology, Atlanta, GA, <sup>2</sup>Georgia Institute of Technology/Emory University, Atlanta, GA**PS-9A-15-187** Serpin-derived Anti-angiogenic Peptides as Therapeutic Agents for Breast CancerJ. E. KOSKIMAKI<sup>1</sup>, E. V. ROSCA<sup>1</sup>, N. V. PANDEY<sup>1</sup>, E. V. KARAGIANNIS<sup>1</sup>, AND A. S. POPEL<sup>1</sup><sup>1</sup>Johns Hopkins University School of Medicine, Baltimore, MD**PS-9A-15-188** ShReD: A Novel Metric for Determining Reciprocal Interactions Between Biochemical Network ComponentsG. SRIDHARAN<sup>1</sup>, D. WEAVER<sup>1</sup>, S. HASSOUN<sup>1</sup>, AND K. LEE<sup>1</sup><sup>1</sup>Tufts University, Medford, MA**Track:Tissue Engineering – PS-9A-16****Biosensors and Tissue Engineering****PS-9A-16-189** Mechanically Directed Endothelial MorphogenesisY. LIU<sup>1,2</sup>, D. A. MARKOV<sup>2</sup>, J. P. WIKSWO<sup>2</sup>, AND L. J. MCCAWLEY<sup>2</sup><sup>1</sup>West Virginia University, Morgantown, WV, <sup>2</sup>Vanderbilt University, Nashville, TN**PS-9A-16-190** A Wireless Platform for Wound Condition MonitoringY-S. SEO<sup>1</sup>, H. CAO<sup>1</sup>, S. K. THAKAR<sup>1</sup>, C. M. NGUYEN<sup>1</sup>, AND J-C. CHIAO<sup>1</sup><sup>1</sup>University of Texas at Arlington, Arlington, TX**PS-9A-16-191** *In Vivo* and *In Silico* Validation of a Novel Implantable Oxygen SensorH. V. JAIN<sup>1</sup>, H. BYRNE<sup>2</sup>, AND N. I. MOLDOVAN<sup>3</sup><sup>1</sup>Mathematical Biosciences Institute, The Ohio State University, Columbus, OH, <sup>2</sup>School of Mathematical Sciences, University of Nottingham, Nottingham, UK, United Kingdom, <sup>3</sup>Davis Heart and Lung Research Institute, Ohio State University, Columbus, OH**PS-9A-16-192** Optimizing the Design of a Self-cleaning Thermoresponsive Hydrogel Membrane for Glucose SensingA. A. ABRAHAM<sup>1</sup>, R. FEI<sup>1</sup>, B. M. CUMMINS<sup>1</sup>, M. A. GRUNLAN<sup>1</sup>, AND G. L. COTE<sup>1</sup><sup>1</sup>Texas A&M University, College Station, TX**PS-9A-16-193** Electrochemical Glucose Biosensor Based on Multi-walled Carbon Nanotubes (MWNTs) Modified Electrode.D. M. SAVANI<sup>1</sup>, A. SANTIAGO<sup>1</sup>, AND P. PATRA<sup>1</sup><sup>1</sup>University of Bridgeport, Bridgeport, CT**Track:Tissue Engineering – PS-9A-17****Host Response to Biomaterials****PS-9A-17-194** Alginate Hydrogels as a Calcium Source for ImmunomodulationG. CHAN<sup>1</sup>, AND D. MOONEY<sup>1</sup><sup>1</sup>Harvard University, Cambridge, MA**PS-9A-17-195** Improved Haemocompatibility of Polyethylene Terephthalate Films Modified by NTPDase ImmobilizationV. MUTHUVIJAYAN<sup>1</sup>, AND R. S. LEWIS<sup>2</sup><sup>1</sup>Oklahoma State University, Stillwater, OK, <sup>2</sup>Brigham Young University, Provo, UT**PS-9A-17-196** Integrin-Directed Modulation of Macrophage Response to BiomaterialsT. ZAVERI<sup>1</sup>, N. DOLGOVA<sup>1</sup>, M. CLARE-SALZLER<sup>1</sup>, AND B. KESELOWSKY<sup>1</sup><sup>1</sup>University of Florida, Gainesville, FL**PS-9A-17-197** Immunogenicity of Bovine and Leporine Meniscus Cells and Articular ChondrocytesJ. SANCHEZ-ADAMS<sup>1</sup>, D. J. HUEY<sup>1</sup>, V. P. WILLARD<sup>1</sup>, AND K. A. ATHANASIOU<sup>2</sup><sup>1</sup>Rice University, Houston, TX, <sup>2</sup>UC Davis, Davis, CA**PS-9A-17-198** Biological Response to Submicron Cobalt Chromium Alloy Particles in a Rabbit ModelM. L. HARPER<sup>1</sup>, V. SINGH<sup>1</sup>, F. W. CHAN<sup>1</sup>, AND N. HALLAB<sup>2</sup><sup>1</sup>Medtronic, Spinal and Biologics, Memphis, TN, <sup>2</sup>Rush University Medical Center, Chicago, IL**Track:Tissue Engineering – PS-9A-18****Musculoskeletal Tissue Engineering****PS-9A-18-199** Effect of Combinatorial Stress Preconditioning and Heat Shock Proteins on Bone RegenerationE. CHUNG<sup>1</sup>, AND M. N. RYLANDER<sup>1</sup><sup>1</sup>Virginia Tech, Blacksburg, VA**PS-9A-18-200** Aligned Collagen-GAG Scaffolds for Tendon Tissue EngineeringS. R. CALIARI<sup>1</sup>, M. RAMIREZ<sup>1</sup>, AND B. A. HARLEY<sup>1</sup><sup>1</sup>University of Illinois at Urbana-Champaign, Urbana, IL**PS-9A-18-201** Skeletal Muscle NanoactuatorK. D. MCKEON-FISCHER<sup>1</sup>, D. H. FLAGG<sup>1</sup>, AND J. W. FREEMAN<sup>1</sup><sup>1</sup>Virginia Polytechnic Institute and State University, Blacksburg, VA**PS-9A-18-202** Force Generation in Engineered Muscle Tissue is Significantly Affected by Cell-matrix InteractionsS. HINDS<sup>1</sup>, W. BIAN<sup>1</sup>, AND N. BURSAC<sup>1</sup><sup>1</sup>Duke University, Durham, NC**PS-9A-18-203** Composite Electrospun/Hydrogel Scaffold for Cartilage Tissue EngineeringL. WRIGHT<sup>1</sup>, K. D. MCKEON-FISCHER<sup>1</sup>, L. S. NAIR<sup>2</sup>, AND J. W. FREEMAN<sup>1</sup><sup>1</sup>Virginia Tech, Blacksburg, VA, <sup>2</sup>University of Connecticut, Farmington, CT**PS-9A-18-204** MicroCT Assessment of Bone Organ Culture Viability and Development in a Neonatal Rat Femur ModelK. GURLEY<sup>1</sup>, A. GOBIN<sup>2</sup>, AND M. SAUNDERS<sup>1</sup><sup>1</sup>University of Kentucky, Lexington, KY, <sup>2</sup>University of Louisville, Louisville, KY**PS-9A-18-205** Improved Cell Infiltration into Electrospun Bone Tissue Scaffolds via Sacrificial Fiber RemovalB. WHITED<sup>1</sup>, J. WHITNEY<sup>1</sup>, Y. XU<sup>1</sup>, AND M. N. RYLANDER<sup>1</sup><sup>1</sup>Virginia Polytechnic Institute and State University, Blacksburg, VA

**PS-9A-18-206** Novel Glucosamine Analogs for Recovery of Chondrocytes from IL-1 TreatmentJ. M. COBURN<sup>1</sup>, J. CRIST<sup>1</sup>, L. WO<sup>1</sup>, K. J. YAREMA<sup>1</sup>, AND J. H. ELISSEFF<sup>1</sup><sup>1</sup>Johns Hopkins University, Baltimore, MD**PS-9A-18-207** Characterization of Electrospun Osteon-like ScaffoldsT. ANDRIC<sup>1</sup>, A. C. SAMPSON<sup>1</sup>, AND J. W. FREEMAN<sup>1</sup><sup>1</sup>Virginia Tech, Blacksburg, VA**PS-9A-18-208** Synthesis of Collagenase-Sensitive Polyureas for Ligament Tissue EngineeringT. J. TOUCHET<sup>1</sup>, H. A. BENHARDT<sup>1</sup>, AND E. M. COSGRIFF-HERNANDEZ<sup>1</sup><sup>1</sup>Texas A&M University, College Station, TX**PS-9A-18-209** Cartilage Tissue Engineering Using Neonatal Human Dermal FibroblastsM. SINGH<sup>1</sup>, F. K. KASPER<sup>1</sup>, AND A. G. MIKOS<sup>1</sup><sup>1</sup>Rice University, Houston, TX**PS-9A-18-210** Soluble Mini-agrin Increases Contractility of Engineered Skeletal Muscle TissuesW. BIAN<sup>1</sup>, AND N. BURSAC<sup>1</sup><sup>1</sup>Duke University, Durham, NC**PS-9A-18-211** Histological Sections - Can Major and Minor Centroidal Axes Serve as Absolute Reference PointsS. H. MCBRIDE<sup>1</sup>, S. DOLEJS<sup>1</sup>, U. KNOTHE<sup>2</sup>, AND M. KNOTHE TATE<sup>1</sup><sup>1</sup>Case Western Reserve University, Cleveland, OH, <sup>2</sup>Cleveland Clinic, Cleveland, OH**PS-9A-18-212** Immature and Mature Muscle Cells Secrete Soluble Factors to Differentially Regulate Embryonic Tendon Cell Tenogenesis *In Vitro*A. H. THOMAS<sup>1</sup>, Z. A. SCHILLER<sup>1</sup>, C. C. BANOS<sup>1</sup>, AND C. K. KUO<sup>1</sup><sup>1</sup>Tufts University, Medford, MA**PS-9A-18-213** Prolotherapy Based Increases in Cellular Proliferation and Collagen Deposition in MC3T3-E1 CellsY. M. EMPSON<sup>1</sup>, E. C. EKWUEME<sup>1</sup>, AND J. W. FREEMAN<sup>1</sup><sup>1</sup>Virginia Tech, Blacksburg, VA**PS-9A-18-214** Multivariate Analysis of Microporosity and BMP on Bone Regeneration in Biphasic CaP ScaffoldsS. POLAK<sup>1</sup>, S. LAN LEVENGOOD<sup>2</sup>, A. MAKI<sup>1</sup>, S. CLARK<sup>1</sup>, M. WHEELER<sup>1</sup>, AND A. WAGONER JOHNSON<sup>1</sup><sup>1</sup>University of Illinois at Urbana-Champaign, Urbana, IL, <sup>2</sup>University of Wisconsin, Madison, WI**PS-9A-18-215** Orientation of Collagen Fibers in the ECM of Osteoblastic Cells by Mechanical TransductionJ. A. BOADA<sup>1</sup>, J. JEREZ<sup>1</sup>, I. DE JESUS<sup>1</sup>, J. VALERA<sup>1</sup>, R. ROMAÑACH<sup>1</sup>, N. DIFFOOT-CARLO<sup>1</sup>, AND P. A. SUNDARAM<sup>1</sup><sup>1</sup>University of Puerto Rico, Mayaguez, Puerto Rico**PS-9A-18-216** Effect of a Mechanical Stimulation Bioreactor on Tissue Engineered Scaffold-Free CartilageS. TRAN<sup>1</sup>, AND S. ELDER<sup>1</sup><sup>1</sup>Mississippi State University, Mississippi State, MS**PS-9A-18-217** Highly Cellular Region of Scaffold-Free Engineered Cartilage Fails Under Compressive Shearing LoadsG. WHITNEY<sup>1</sup>, K. JAYARAMAN<sup>1</sup>, J. E. DENNIS<sup>1</sup>, AND J. M. MANSOUR<sup>1</sup><sup>1</sup>Case Western Reserve University, Cleveland, OH**PS-9A-18-218** Novel Hydrogels of Photo-Crosslinkable PEG Macromers and Chitosan for Cartilage Tissue EngineeringB. J. KLEIN<sup>1</sup>, A. HARLEY<sup>1</sup>, AND J. A. COOPER<sup>1</sup><sup>1</sup>Rensselaer Polytechnic Institute, Troy, NY**PS-9A-18-219** Synovium-Derived Stem Cells for Cartilage Tissue EngineeringS. R. SAMPAT<sup>1</sup>, G. O'CONNELL<sup>1</sup>, J. FONG<sup>1</sup>, AND C. T. HUNG<sup>1</sup><sup>1</sup>Columbia University, New York, NY**PS-9A-18-220** *In Vitro* Evaluation of Magnesium Alloys for the Regeneration of Ligament and Ligament-Bone InterfaceH. LIU<sup>1</sup>, Z. XU<sup>2</sup>, AND S. L-Y. WOO<sup>1</sup><sup>1</sup>University of Pittsburgh, Pittsburgh, PA, <sup>2</sup>North Carolina A&T State University, Greensboro, NC**Track: Tissue Engineering – PS-9A-19****Translational Tissue Engineering and Clinical Experience\*****PS-9A-19-221** Factors Affecting Tissue Culture and Transplantation Using OmentumJ. KIM<sup>1</sup>, H. LEE<sup>1</sup>, AND S. SEO<sup>1</sup><sup>1</sup>SungKyunKwan University, Seoul, Seoul, Korea, Republic of**PS-9A-19-222** Computational Prediction of Breast Features after Partial MastectomyD. THANOON<sup>1</sup>, M. GARBEY<sup>1</sup>, AND B. L. BASS<sup>2</sup><sup>1</sup>University of Houston, Houston, TX, <sup>2</sup>The Methodist Hospital System, Houston, TX**PS-9A-19-223** Comparing the Biomechanical Response of Porcine, Bovine, and Human Liver TissueA. SANTAGO<sup>1</sup>, A. KEMPER<sup>1</sup>, J. SPARKS<sup>2</sup>, AND S. DUMA<sup>1</sup><sup>1</sup>Virginia Tech - Wake Forest School For Biomedical Engineering and Sciences, Blacksburg, VA, <sup>2</sup>Virginia Tech - Wake Forest School For Biomedical Engineering and Sciences, Winston-Salem, NC

## Track: Tissue Engineering – PS-9B-1

## Undergraduate

**PS-9B-1-1** Characterization of Early Embryonic Tissue Properties and their Effects on Stem Cell and Organ Development in Chick Cardiac Model  
N. CHAPURIN<sup>1</sup>, A. NEUMANN<sup>1</sup>, N. S. LOR<sup>2</sup>, K. SAYED<sup>1</sup>, B. DAVIS<sup>3</sup>, M. C. GOUDE<sup>3</sup>, AND J. BUTCHER<sup>1</sup>

<sup>1</sup>Cornell University, Ithaca, NY, <sup>2</sup>East Carolina University, Greenville, NC, <sup>3</sup>University of Florida, Gainesville, FL

**PS-9B-1-2** Optimization of a Lab-on-chip Sensor for Highly Electronegative Heavy Metals

J. L. HERREN<sup>1</sup>, P. JOTHIMUTHU<sup>1</sup>, R. WILSON<sup>1</sup>, W. R. HEINEMAN<sup>1</sup>, AND I. PAPAUSKY<sup>1</sup>  
<sup>1</sup>University of Cincinnati, Cincinnati, OH

**PS-9B-1-3** HOXA1 Regulation of an Athero-susceptible Phenotype in Endothelium

P. ISLAM<sup>1</sup>, Y. FANG<sup>1</sup>, AND P. F. DAVIES<sup>1</sup>  
<sup>1</sup>University of Pennsylvania, Philadelphia, PA

**PS-9B-1-4** Platelet-targeted Liposomal Nanoconstructs for Site-specific Drug Delivery in Vascular Disease

C. MODERY<sup>1</sup>, M. RAVIKUMAR<sup>1</sup>, AND A. SEN GUPTA<sup>1</sup>  
<sup>1</sup>Case Western Reserve University, Cleveland, OH

**PS-9B-1-5** Optimization of Growth of *Gluconobacter* sp. 33 and PQQ-Dependent Enzyme Purification

D. W. STERN<sup>1</sup>, AND S. D. MINTEER<sup>2</sup>  
<sup>1</sup>Bucknell University, Lewisburg, PA, <sup>2</sup>Saint Louis University, Saint Louis, MO

**PS-9B-1-6** A Simple Microfluidic Device for *C. elegans* Immobilization Fabricated Using Household Materials

B. G. WONG<sup>1</sup>, O. CINQUIN<sup>1</sup>, AND E. E. HUI<sup>1</sup>  
<sup>1</sup>University of California, Irvine, Irvine, CA

**PS-9B-1-7** Assessment of Silicate Cross-linked Poly(ethylene oxide) Hydrogels for Orthopedic Tissue Repair

J. CANTER<sup>1</sup>, S. A. DAMMU<sup>1</sup>, S. VAID<sup>1</sup>, A. GAHARWAR<sup>1</sup>, AND G. SCHMIDT<sup>1</sup>  
<sup>1</sup>Purdue University, West Lafayette, IN

**PS-9B-1-8** Synthesis of a Biodegradable Methacrylated Ester for Bone Graft Fabrication

C. J. WILSON<sup>1</sup>, R. MOGLIA<sup>2</sup>, AND E. COSGRIFF-HERNANDEZ<sup>2</sup>  
<sup>1</sup>Texas Lutheran University, Seguin, TX, <sup>2</sup>Texas A&M University, College Station, TX

**PS-9B-1-9** Cytokine Regulation of CD4T cell Memory Development

R. A. AMEZQUITA<sup>1,2</sup>, H. D. MARSHALL<sup>3</sup>, AND S. M. KAECH<sup>3</sup>  
<sup>1</sup>University of California - San Diego, San Diego, CA, <sup>2</sup>HHMI EXROP, Chevy Chase, MD, <sup>3</sup>Yale University, New Haven, CT

**PS-9B-1-10** A High Throughput Workflow For The Analysis Of Diaxial Shifts In *Escherichia Coli* In A Paired Carbon Substrate Environment

A. CHAUDHARI<sup>1</sup>, N. LEWIS<sup>1</sup>, J. LERMAN<sup>1</sup>, AND B. PALSSON<sup>1</sup>  
<sup>1</sup>University of California San Diego, La Jolla, CA

**PS-9B-1-11** Surface Capture and Imaging of H1N1 Virus

M. JOHNSON<sup>1</sup>, H. STEPHANO<sup>2</sup>, M. R. RONER<sup>3</sup>, AND S. M. IQBAL<sup>4</sup>  
<sup>1</sup>Department of Biology, ARRI, University of Texas at Arlington, Fort Worth, TX, <sup>2</sup>Department of Electrical Engineering, ARRI, University of Texas at Arlington, Fort Worth, TX, <sup>3</sup>Department of Biology, University of Texas at Arlington, Arlington, TX, <sup>4</sup>Department of Electrical Engineering, NanoFab, University of Texas Arlington, Arlington, TX

**PS-9B-1-12** Multiphoton Microscopy Histology of Cleared Mouse Organs

S. G. PARRA<sup>1</sup>, T. H. CHIA<sup>1</sup>, J. P. ZINTER<sup>1</sup>, AND M. J. LEVENE<sup>1</sup>  
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**PS-9B-1-13** Galectin-I and Human Umbilical Cord Mesenchymal Stromal Cell (HUCMSC) Differentiation *In Vitro*

E. J. LEE<sup>1</sup>, L. JING<sup>1</sup>, L. A. SETTON<sup>1,2</sup>, AND J. CHEN<sup>1</sup>  
<sup>1</sup>Duke University, Durham, NC, <sup>2</sup>Duke Medical Center, Durham, NC

**PS-9B-1-14** Assessment of FRET Probes for High-Content Screening of Anti-AIDS Inhibitors

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<sup>1</sup>Southeast Missouri State University, MO, MO, <sup>2</sup>University of Arkansas, Fayetteville, AR

**PS-9B-1-15** Design and Development of a Hemodynamic Pump for Arterial Wall Shear Stress Measurements

S. NEWCOMER<sup>1</sup>, AND K. D. HUDSON<sup>1</sup>  
<sup>1</sup>Purdue University, West Lafayette, IN

**PS-9B-1-16** Phospholipid Composition Affects CLC-ec1 Chloride-transport Activity

T. CHEW<sup>1,2</sup>, S. ELVINGTON<sup>1</sup>, AND M. MADUKE<sup>1</sup>  
<sup>1</sup>Stanford University, Stanford, CA, <sup>2</sup>University of California, San Diego, La Jolla, CA

**PS-9B-1-17** Thread as a Matrix for Biomedical Assays

R. DASGUPTA<sup>1</sup>, M. RECHES<sup>1</sup>, AND G. WHITESIDES<sup>1</sup>  
<sup>1</sup>Harvard University, Cambridge, MA

**PS-9B-1-18** Vinculin Adhesion Strength Regulation of Matrix Stiffness-Induced Stem Cell Differentiation

D. S. VIJAYRAGHAVAN<sup>1</sup>, A. W. HOLLE<sup>1</sup>, AND A. J. ENGLER<sup>1</sup>  
<sup>1</sup>University of California San Diego, La Jolla, CA

**PS-9B-1-19** Design and Implementation of Novel Silicone Cup Attachment for Ambulatory EEG Electrode

S. M. BOST<sup>1</sup>, M. A. LONG<sup>1</sup>, F. GILLIAM<sup>2</sup>, K. A. BIERYLA<sup>1</sup>, AND J. V. TRANQUILLO<sup>1</sup>  
<sup>1</sup>Bucknell University, Lewisburg, PA, <sup>2</sup>Geisinger Medical Center, Danville, PA

**PS-9B-1-20** Optimization of a Novel Method to Estimate Synovial Fluid Volume

B. J. HINTON<sup>1</sup>, B. C. HANSEN<sup>2</sup>, J. P. CAFFREY<sup>2</sup>, AND R. L. SAH<sup>2</sup>  
<sup>1</sup>University of Minnesota-Twin Cities, Minneapolis, MN, <sup>2</sup>University of California-San Diego, La Jolla, CA

**PS-9B-1-21** A Novel Microfluidic Experimental System for Investigating Neutrophil Decision Making in Chemotaxis

G. OU<sup>1</sup>, A. ARANYOSI<sup>2</sup>, AND D. IRIMIA<sup>2,3</sup>  
<sup>1</sup>Franklin W. Olin College of Engineering, Needham, MA, <sup>2</sup>Center for Engineering in Medicine, Massachusetts General Hospital, Charlestown, MA, <sup>3</sup>Harvard Medical School, Cambridge, MA

**PS-9B-1-22** Stability Characterization of PEG-Conjugated Nanoshells for Improved Passive Tumor Accumulation

L. M. TANENBAUM<sup>1</sup>, A. J. COUGHLIN<sup>1</sup>, AND J. L. WEST<sup>1</sup>  
<sup>1</sup>Rice University, Houston, TX

**PS-9B-1-23** MindBot: Robotic Control via Wireless Neural Headset

T. E. LAIRD<sup>1</sup>, AND N. L. JOHNSON<sup>1</sup>  
<sup>1</sup>Clemson University, Clemson, SC

**PS-9B-1-24** Prediction of Future Glucose Concentrations Using Linear Time-Series Models

L. MARXKORS<sup>1</sup>, M. ORUKLU<sup>2</sup>, AND A. CINAR<sup>2</sup>  
<sup>1</sup>Saint Louis University, St. Louis, MO, <sup>2</sup>Illinois Institute of Technology, Chicago, IL

**PS-9B-1-25** Mechanobiology of the Periosteum: Finite Element Modeling and Histological Analysis

R. M. MILLER<sup>1</sup>, S. DOLEJS<sup>1</sup>, S. H. MCBRIDE<sup>1</sup>, U. KNOTHE<sup>2</sup>, AND M. L. KNOTHE TATE<sup>1</sup>  
<sup>1</sup>Case Western Reserve University, Cleveland, OH, <sup>2</sup>Cleveland Clinic Foundation, Cleveland, OH

**PS-9B-1-26** Cross-linked PEG-poly(amino acid) Nanoassemblies for Controlled Drug Delivery

L. SANDLIN<sup>1</sup>, A. PONTA<sup>2</sup>, AND Y. BAE<sup>2</sup>  
<sup>1</sup>University of Kentucky, College of Engineering, Lexington, KY, <sup>2</sup>University of Kentucky, College of Pharmacy, Lexington, KY

PS = Poster Session  
OP = Oral Presentation

**PS-9B-I-27** Pentablock Copolymers for Sustained Gene DeliveryM. Q. FLEMING<sup>1</sup>, B. ZHANG<sup>2</sup>, AND S. MALLAPRAGADA<sup>2</sup><sup>1</sup>University of Texas at Austin, Austin, TX, <sup>2</sup>Iowa State University, Ames, IA**PS-9B-I-28** Functionalized Macrocycles: A Journey toward a New Class of Insulin MimeticsV. RAMBARAN<sup>1</sup>, C. RAMKISSOON<sup>2</sup>, AND K. MUNGAL<sup>2</sup><sup>1</sup>The University of Trinidad and Tobago, Arima, Trinidad and Tobago, <sup>2</sup>University of Trinidad and Tobago, Arima, Trinidad and Tobago**PS-9B-I-29** Effect of Cryopreservation on Periosteal TissueS. EVANS<sup>1</sup>, S. MCBRIDE<sup>1</sup>, AND M. L. KNOTHE TATE<sup>1</sup><sup>1</sup>Case Western Reserve University, Cleveland, OH**PS-9B-I-30** Development of Eye Injury Risk Functions for Multiple Projectile Diameters using the FOCUS HeadformR. CHAKLADER<sup>1</sup>, E. THIEL<sup>1</sup>, AND E. KENNEDY<sup>1</sup><sup>1</sup>Bucknell University, Lewisburg, PA**PS-9B-I-31** Multi-Angle Light Scatter Measurement in Flow Cytometry: Toward Enhanced Physical Properties Detection and Label-Free ClassificationP. B. CARLSGAARD<sup>1</sup>, B. P. RAJWA<sup>1</sup>, N. R. LEWIS<sup>1</sup>, V. P. PATSEKIN<sup>1</sup>, C. M. HOLDMAN<sup>1</sup>, K. E. RAGHEB<sup>1</sup>, P. RIGBY<sup>1</sup>, D. KRAMER<sup>1</sup>, AND J. P. ROBINSON<sup>1</sup><sup>1</sup>Purdue University, West Lafayette, IN**PS-9B-I-32** Influence of Cell-Substrate Chemistry on Stem Cell Adhesion Using Novel TIRF MicroscopeD. CARLIN<sup>1</sup>, S. RAMACHANDRAN<sup>2</sup>, S. VARGHESE<sup>2</sup>, AND R. LAL<sup>2</sup><sup>1</sup>California Polytechnic State University San Luis Obispo, San Luis Obispo, CA, <sup>2</sup>University of California San Diego, La Jolla, CA**PS-9B-I-33** Pulmonary-Airway-On-a-Chip: A Microfluidic Model of Pulmonary Airway Reopening at BifurcationsJ. J. PITRE<sup>1</sup>, E. YAMAGUCHI<sup>1</sup>, B. J. SMITH<sup>1</sup>, O. FOROUZAN<sup>1</sup>, S. S. SHEVKOPLYAS<sup>1</sup>, AND D. P. GAVER, III<sup>1</sup><sup>1</sup>Tulane University, New Orleans, LA**PS-9B-I-34** Computational Insight on the Influence of Subunit Packing on the Thermostability of Lactate OxidaseN. J. HAMS<sup>1</sup>, L. PENG<sup>2</sup>, AND D. GOUGH<sup>2</sup><sup>1</sup>University of Missouri - Columbia, Columbia, MO, <sup>2</sup>University of California - San Diego, La Jolla, CA**PS-9B-I-35** Computational Study of Infarct Reinforcement and Its Impact on Left Ventricular FunctionJ. R. MACDANGDANG<sup>1</sup>, J. W. HOLMES<sup>1</sup>, AND G. M. FOMOVSKY<sup>1</sup><sup>1</sup>University of Virginia, Charlottesville, VA**PS-9B-I-36** Improvement of Registration of 2D X-ray Mammograms and 3D Speed of Sound ImagesJ. BONN<sup>1,2</sup>, T. HOPP<sup>1</sup>, N. RUITER<sup>1</sup>, AND N. DURIC<sup>3</sup><sup>1</sup>Karlsruhe Institute of Technology, Karlsruhe, Baden-Württemberg, Germany, <sup>2</sup>University of Cincinnati, Cincinnati, OH, <sup>3</sup>Barbara Ann Karmanos Cancer Institute, Detroit, MI**PS-9B-I-37** An Investigation into Sex-related Differences in Pulmonary HemodynamicsR. H. CLAYMAN<sup>1</sup>, A. ROLDAN<sup>1</sup>, AND N. C. CHESLER<sup>1</sup><sup>1</sup>University of Wisconsin, Madison, WI**PS-9B-I-38** Study of Biopolymer Tissue Scaffold DegradationE. MCMULLIN<sup>1</sup>, AND K. C. YAN<sup>1</sup><sup>1</sup>The College of New Jersey, Ewing, NJ**PS-9B-I-39** Study of Heart Tissue Damage via Dynamic Heart PhantomM. McDONOUGH<sup>1</sup>, AND K. C. YAN<sup>1</sup><sup>1</sup>The College of New Jersey, Ewing, NJ**PS-9B-I-40** Pressure-Area Relationship of the Carpal Tunnel: A Cadaveric StudyT. L. MASTERS<sup>1</sup>, T. A. MONDELLO<sup>1</sup>, AND Z-M. LI<sup>1</sup><sup>1</sup>Cleveland Clinic, Cleveland, OH**PS-9B-I-41** Promoting Peripheral Nerve Repair Using Basement Membrane-Polycaprolactone Nanofiber ScaffoldsD. ABEYAYEHU<sup>1</sup>, R. A. NEAL<sup>1</sup>, AND E. BOTCHWEY<sup>1</sup><sup>1</sup>U. of Virginia, Charlottesville, VA**PS-9B-I-42** Droplet Based Microfluidics for Single Cell Genetic AnalysisR. J. KIMMERLING<sup>1</sup>, T. BAKOWSKI<sup>1</sup>, AND H. STREY<sup>1</sup><sup>1</sup>Stony Brook University, Stony Brook, NY**PS-9B-I-43** Immobilization of Trypsin in a PDMS Channel for Protein Digestion and AnalysisT. LOCKE<sup>1</sup>, C. GOODWIN<sup>1</sup>, C. MARASCO<sup>1</sup>, J. WIKSWO<sup>1</sup>, AND J. MCLEAN<sup>1</sup><sup>1</sup>Vanderbilt University, Nashville, TN**PS-9B-I-44** Study of the Effects of Chemokines Secreted by Endothelial Cells in Response to Shear Stress on Cancer Metastasis in a Microfluidic DeviceB. Z. AKSELRAD<sup>1</sup>, M. IRVIN<sup>1</sup>, P. SAMSON<sup>1</sup>, A. POZZI<sup>1</sup>, AND J. WIKSWO<sup>1</sup><sup>1</sup>Vanderbilt University, Nashville, TN**PS-9B-I-45** Development of an Inexpensive Device for Non-contact Measurement of Skin TemperatureS. E. NAYLOR<sup>1</sup>, D. NELSON<sup>1</sup>, AND S. LEAVESLEY<sup>1</sup><sup>1</sup>University of South Alabama, Mobile, AL**PS-9B-I-46** Characterization of Degradable Poly(ester amines) and Poly(amido amines) for Non-viral Gene DeliveryD. Y. PENG<sup>1</sup>, J. C. SUNSHINE<sup>2</sup>, AND J. J. GREEN<sup>2</sup><sup>1</sup>Johns Hopkins University, Baltimore, MD, <sup>2</sup>Johns Hopkins University School of Medicine, Baltimore, MD**PS-9B-I-47** Self-Cleaning Micropatterned Nanocomposite HydrogelsJ. T. GEORGE<sup>1</sup>, R. FEI<sup>1</sup>, A. HAN<sup>1</sup>, M. S. HAHN<sup>1</sup>, AND M. A. GRUNLAN<sup>1</sup><sup>1</sup>Texas A&M University, College Station, TX**PS-9B-I-48** Quantifying the Effects of Cerebrospinal Fluid Pulsations on Intrathecal Drug DeliveryT. J. HARRIS<sup>1</sup>, Y. HSU<sup>1</sup>, M. HETTIARACHCHI<sup>1</sup>, AND A. LINNINGER<sup>1</sup><sup>1</sup>University of Illinois at Chicago, Chicago, IL**PS-9B-I-49** The Dynamic Expression of Heat Shock Proteins in Human Mesenchymal Stem Cells After Mild Heat ShockJ. ZHANG<sup>1</sup>, J. CHEN<sup>1</sup>, AND S. WANG<sup>1</sup><sup>1</sup>The City College Of New York / CUNY, New York, NY**PS-9B-I-50** Stabilization of Enzymes via Binding to PeptidesA. PRASAD<sup>1,2</sup>, J. FU<sup>1,3</sup>, AND N. WOODBURY<sup>1,3</sup><sup>1</sup>The Biodesign Institute at Arizona State University, Tempe, AZ, <sup>2</sup>Ira A. Fulton School of Engineering at Arizona State University, Tempe, AZ, <sup>3</sup>College of Liberal Arts and Sciences at Arizona State University, Tempe, AZ**PS-9B-I-51** PDMSstar-PEG Hydrogels as Tissue Engineering ScaffoldsK. HUI<sup>1</sup>, B. M. BAILEY<sup>1</sup>, AND M. A. GRUNLAN<sup>1</sup><sup>1</sup>Texas A&M University, College Station, TX**PS-9B-I-52** Development of a Microfluidic Platform for Neural Stem Cell Differentiation and ProliferationS. DRIA<sup>1</sup>, I. YANG<sup>1</sup>, N. THAKOR<sup>1</sup>, AND A. NATH<sup>1</sup><sup>1</sup>Johns Hopkins University, Baltimore, MD**PS-9B-I-53** Developing New Expansion and Differentiation Media for Human Adipose Tissue-derived Mesenchymal Stem CellsK. KATHIRIA<sup>1,2</sup>, D. WAGNER<sup>2</sup>, AND H. WEISS<sup>2</sup><sup>1</sup>Florida International University, Miami, FL, <sup>2</sup>University of Notre Dame, Notre Dame, IN**PS-9B-I-54** Generation of Predictive Models for Anti-Proliferative Drug Release from a Biodegradable ElastomerA. L. PELINESCU<sup>1</sup>, Y. HONG<sup>1,2</sup>, AND W. R. WAGNER<sup>1,2</sup><sup>1</sup>University of Pittsburgh, Pittsburgh, PA, <sup>2</sup>McGowan Institute for Regenerative Medicine, Pittsburgh, PA**PS-9B-I-55** The Use of Quantum Dots for Labeling Neural Cell LinesM. SMYTH<sup>1</sup>, R. WILLITS<sup>2</sup>, AND A. HARKINS<sup>3</sup><sup>1</sup>Vanderbilt University, Nashville, TN, <sup>2</sup>University of Akron, Akron, OH, <sup>3</sup>Saint Louis University, St. Louis, MO

**PS-9B-I-56** Localized and Automated Chemical and Oxygen Delivery System for Microfluidic Brain Slice DevicesG. J. YU<sup>1</sup>, A. BLAKE<sup>2</sup>, AND D. EDDINGTON<sup>2</sup><sup>1</sup>University of Illinois at Urbana-Champaign, Urbana, IL, <sup>2</sup>University of Illinois at Chicago, Chicago, IL**PS-9B-I-57** Effects of Cyclic Stretch on Expression of Pro-Inflammatory GenesS. VANDERZYL<sup>1</sup>, H.-J. HSU<sup>1</sup>, A. W. ORR<sup>2</sup>, AND R. KAUNAS<sup>1</sup><sup>1</sup>Texas A&M University, College Station, TX, <sup>2</sup>LSU Health Sciences Center - Shreveport, Shreveport, LA**PS-9B-I-58** Deficiencies in Mechanical Properties of Peripheral Nerves in Fibrillin-2 Knockout MiceD. REDMOND-WHITE<sup>1</sup>, R. STAHL<sup>2</sup>, D. CAREY<sup>2</sup>, AND D. M. EBENSTEIN<sup>1</sup><sup>1</sup>Bucknell University, Lewisburg, PA, <sup>2</sup>Weis Center for Research, Geisinger Medical Center, Danville, PA**PS-9B-I-59** *In Vitro* Forced Formation of Tunneling Nanotubes in T cells Using Micro-tipped PipettesS. KABANI<sup>1</sup>, C. MARASCO<sup>1</sup>, AND J. WIKSWO<sup>1</sup><sup>1</sup>Vanderbilt University, Nashville, TN**PS-9B-I-60** A Novel Nanoparticle-Enhanced Biophysical Stimulus for Bone Tissue EngineeringY. TALUKDAR<sup>1</sup>, K. SCHAEFER<sup>1</sup>, P. AVTI<sup>1</sup>, J. P. LONGTIN<sup>1</sup>, AND B. SITHARAMAN<sup>1</sup><sup>1</sup>State University of New York at Stony Brook, Stony Brook, NY**PS-9B-I-61** Fabricating Biodegradable Paclitaxel-Loaded Spheroidal Microparticles for Drug Delivery ApplicationsO. SHEMI<sup>1</sup>, M. HESLINGA<sup>2</sup>, AND O. ENIOLA-ADEFESO<sup>2</sup><sup>1</sup>University of Maryland, Baltimore County, Catonsville, MD, <sup>2</sup>University of Michigan, Ann Arbor, MI**PS-9B-I-62** A Novel Method to Create Macrochannels in Three-Dimensional Hydrogels for Enhanced Cell ProliferationJ. W. KIM<sup>1</sup>, AND B. M. WU<sup>1</sup><sup>1</sup>University of California, Los Angeles, Los Angeles, CA**PS-9B-I-63** Mechanical Contribution of Smooth Muscle Cells in Large Elastic ArteriesB. CORLEY<sup>1</sup>, V. LE<sup>1</sup>, AND J. WAGENSEIL<sup>1</sup><sup>1</sup>Saint Louis University, Saint Louis, MO**PS-9B-I-64** Glucose Stimulated Insulin Release in Single Pancreatic Islets Using Microfluidics Coupled with Ion Mobility-Mass SpectrometryA. A. OSTROWSKI<sup>1</sup>, J. ENDERS<sup>1</sup>, C. GOODWIN<sup>1</sup>, C. MARASCO<sup>1</sup>, K. T. SEALE<sup>1</sup>, J. MCLEAN<sup>1</sup>, AND J. WIKSWO<sup>1</sup><sup>1</sup>Vanderbilt University, Nashville, TN**PS-9B-I-65** Mapping Local Strains in *Mytilus edulis* Bysal ThreadsN. KO<sup>1</sup>, AND D. M. EBENSTEIN<sup>1</sup><sup>1</sup>Bucknell University, Lewisburg, PA**PS-9B-I-66** Characterization and Optimization of Enzymatically-Degradable Microgels for Pulmonary Drug DeliveryA. E. BERGERON<sup>1</sup>, P. WANAKULE<sup>1</sup>, AND K. ROY<sup>1</sup><sup>1</sup>The University of Texas at Austin, Austin, TX**PS-9B-I-67** Aspirin Inhibits Activation of Aortic Valve Endothelial Cells by Angiotensin IIA. RUHL<sup>1</sup>, C. MCINTOSH<sup>1</sup>, AND J. N. WARNOCK<sup>1</sup><sup>1</sup>Mississippi State University, Mississippi State, MS**PS-9B-I-68** Analyzing Immune Effects of Staphylococcal Enterotoxin B in a Microfluidic-Ion Mobility-Mass Spectrometer PlatformA. GARZA<sup>1</sup>, C. MARASCO<sup>1</sup>, C. GOODWIN<sup>1</sup>, J. ENDERS<sup>1</sup>, K. SEALE<sup>1</sup>, J. MCLEAN<sup>1</sup>, AND J. WIKSWO<sup>1</sup><sup>1</sup>Vanderbilt University, Nashville, TN**PS-9B-I-69** Effect of Cell-matrix Interface on Organization and Myogenic Differentiation of Stem CellsS. VARGHESE<sup>1</sup>, R. POWERS<sup>1</sup>, A. AUNG<sup>1</sup>, M. GADDE<sup>1</sup>, AND S. SHROFF<sup>1</sup><sup>1</sup>University of California, San Diego, La Jolla, CA**PS-9B-I-70** Real-time Monitoring of -Factor Induced Mating Response in *S. cerevisiae* SecretomesA. KOLE<sup>1</sup>, E. CURTIS<sup>1</sup>, B. NGUYEN<sup>2</sup>, J. ENDERS<sup>1</sup>, T. GRAHAM<sup>1</sup>, K. SEALE<sup>1</sup>, J. MCLEAN<sup>1</sup>, AND J. WIKSWO<sup>1</sup><sup>1</sup>Vanderbilt University, Nashville, TN, <sup>2</sup>Belmont University, Nashville, TN**PS-9B-I-71** Investigation of CEACAM1 Dynamics by Single Cell ImagingL. POLONI<sup>1</sup>, AND C. M. YIP<sup>2,3</sup><sup>1</sup>Division of Engineering Science, University of Toronto, Toronto, Ontario, Canada, <sup>2</sup>Institute of Biomaterials and Biomedical Engineering, University of Toronto, Toronto, Ontario, Canada, <sup>3</sup>Department of Chemical Engineering and Applied Chemistry, University of Toronto, Toronto, Ontario, Canada**PS-9B-I-72** Determining the Number of Cells Microencapsulated within PEGDA Hydrogel MicrospheresA. RAJGARIAH<sup>1</sup>, R. M. OLABISI<sup>2</sup>, C. L. SIMPSON<sup>2</sup>, AND J. L. WEST<sup>2</sup><sup>1</sup>Duke University, Durham, NC, <sup>2</sup>Rice University, Houston, TX**PS-9B-I-73** Decellularized Lipoaspirate as a Naturally-Derived Scaffold for Adipose Tissue EngineeringD. O. IBRAHIM<sup>1</sup>, A. YOUNG<sup>1</sup>, AND K. L. CHRISTMAN<sup>1</sup><sup>1</sup>UCSD, La Jolla, CA**PS-9B-I-74** Studies on Cardiomyocyte Health and Embryonic Stem Cell Differentiation Within a Microfluidic PlatformC. ALLAMNENI<sup>1</sup>, S. FALEY<sup>2</sup>, AND A. HATZOPOULOS<sup>3</sup><sup>1</sup>Vanderbilt University, Searle SyBBURE Program, Nashville, TN, <sup>2</sup>Vanderbilt University Department of Cardiovascular Medicine, Nashville, TN, <sup>3</sup>Vanderbilt University Department of Cardiovascular Medicine, Nashville, TN**PS-9B-I-75** Effect of Varying PLGA Molecular Weight Blends on Small-Molecule Drug ReleaseA. OLEAR<sup>1</sup>, L. SOLORIO<sup>1</sup>, J. HAMILTON<sup>2</sup>, AND A. EXNER<sup>1</sup><sup>1</sup>Case Western Reserve University, Cleveland, OH, <sup>2</sup>Johns Hopkins University, Baltimore, MD**PS-9B-I-76** Bone and Cartilage Compensation in Response to Diet-Induced ObesityA. H. TSOI<sup>1</sup>, M. E. BOTROS<sup>1</sup>, E. M. FIEVISOHN<sup>1</sup>, M. E. CHAN<sup>1</sup>, AND C. T. RUBIN<sup>1</sup><sup>1</sup>Stony Brook University, Stony Brook, NY**PS-9B-I-77** Local Schwann Cell-Produced Extracellular Matrix Can Direct Local Neurite OutgrowthA. L. MCGREGOR<sup>1</sup>, A. M. SEGGIO<sup>1</sup>, AND D. M. THOMPSON<sup>1</sup><sup>1</sup>Rensselaer Polytechnic Institute, Troy, NY**PS-9B-I-78** Designing Synapse Morphometry Tools for the Drosophila Brain Connectome ProjectA. L. MCGREGOR<sup>1,2</sup>, P. K. RIVLIN<sup>2</sup>, AND L. K. SCHEFFER<sup>2</sup><sup>1</sup>Rensselaer Polytechnic Institute, Troy, NY, <sup>2</sup>Janelia Farm Research Campus, Howard Hughes Medical Institute, Ashburn, VA**PS-9B-I-79** Development of Semi-Automated Algorithm for Bone Marrow Adiposity MeasurementM. BOTROS<sup>1</sup>, A. TSOI<sup>1</sup>, E. FIEVISOHN<sup>1</sup>, E. CHAN<sup>1</sup>, AND C. RUBIN<sup>1</sup><sup>1</sup>Stony Brook University, Stony Brook, NY**PS-9B-I-80** Toward Understanding Nitric Oxide Release in Lymphatic Endothelial CellsK. NIXON<sup>1</sup>, AND M. FROST<sup>1</sup><sup>1</sup>Michigan Tech, Houghton, MI**PS-9B-I-81** Regeneration of Periosteum in Denuded BoneM. YU<sup>1</sup>, U. KNOTHE<sup>2</sup>, AND M. KNOTHE TATE<sup>1</sup><sup>1</sup>Case Western Reserve University, Cleveland, OH, <sup>2</sup>Cleveland Clinic Foundation, Cleveland, OH



**PS-9B-I-82 Poly Lactic-co-Glycolic Acid Carbon Nanofiber Materials for Cardiac Patch Applications**D. A. STOUT<sup>1,2</sup>, AND T. J. WEBSTER<sup>1</sup><sup>1</sup>Brown University, Providence, RI, <sup>2</sup>California State University, Long Beach, CA**PS-9B-I-83 Single Pore System for Classification of Cells**R. A. KHAN<sup>1</sup>, W. ASGHAR<sup>2</sup>, Y. WAN<sup>3</sup>, AND S. M. IQBAL<sup>4</sup><sup>1</sup>Department of Electrical Engineering, Honors College, University of Texas at Arlington, Arlington, TX, <sup>2</sup>Department of Electrical Engineering, NanoFab, University of Texas Arlington, Arlington, TX, <sup>3</sup>Department of Bioengineering, NanoFab, University of Texas Arlington, Arlington, TX, <sup>4</sup>University of Texas Arlington, Arlington, TX**PS-9B-I-84 Geometrical Effects of Flow Chambers on Chemokine Secreting Cancer Cells**P. DELNERO<sup>1</sup>, J. TEO<sup>2</sup>, U. HAESSLER<sup>2</sup>, AND M. SWARTZ<sup>2</sup><sup>1</sup>Vanderbilt University, Nashville, TN, <sup>2</sup>École Polytechnique Fédérale de Lausanne (EPFL), Lausanne, Switzerland**PS-9B-I-85 Quantifying Elastin and Collagen in Developing Mouse Arteries**A. WEBSTER<sup>1</sup>, V. LE<sup>2</sup>, AND J. WAGENSEIL<sup>2</sup><sup>1</sup>University of Wisconsin, Madison, WI, <sup>2</sup>Saint Louis University, St. Louis, MO**PS-9B-I-86 The Salifier: A New Device for Saliva Collection from Infants for DNA Analysis**E. FRANZ<sup>1</sup>, G. BOON III<sup>1</sup>, G. GERHARD<sup>2</sup>, J. BAISH<sup>1</sup>, AND D. EBENSTEIN<sup>1</sup><sup>1</sup>Bucknell University, Lewisburg, PA, <sup>2</sup>Weis Center for Health Research at Geisinger Medical Center, Danville, PA**PS-9B-I-87 Comparing Diffusion Coefficients Through Thin PDMS Membranes Exposed to Various Surface Treatments**E. LILLIE<sup>1,2</sup>, L. MCCAWLEY<sup>1,2</sup>, D. MARKOV<sup>1</sup>, AND S. GARBETT<sup>2</sup><sup>1</sup>Vanderbilt Institute for Integrative Biosystems Research and Education (VIIBRE), Nashville, TN, <sup>2</sup>Department of Cancer Biology, Vanderbilt University Medical Center, Nashville, TN**PS-9B-I-88 Finite Element Model to Examine Stress Distributions in Mechanical Tests on Mouse Arteries**C. MULCAHY<sup>1</sup>, M. AMIN<sup>2</sup>, AND J. WAGENSEIL<sup>2</sup><sup>1</sup>University of Minnesota, Minneapolis, MN, <sup>2</sup>Saint Louis University, St. Louis, MO**PS-9B-I-89 Mechanisms Governing Vascular Endothelium under Pulsatile and Oscillatory Conditions**M. SOSA<sup>1</sup>, P. VANDRANGI<sup>1</sup>, AND V. RODGERS<sup>1</sup><sup>1</sup>University of California Riverside, Riverside, CA**PS-9B-I-90 A Polymeric siRNA Delivery System to Induce Differentiation in hMSCs**M. E. BOUTIN<sup>1</sup>, AND D. S. BENOIT<sup>1</sup><sup>1</sup>University of Rochester, Rochester, NY**PS-9B-I-91 Constructing a Realistic Brain phantom to Validate the Independent Component Analysis of EEG Data**T. G. HARVEY<sup>1</sup>, B. DEAN<sup>2</sup>, AND D. DEAN<sup>2</sup><sup>1</sup>South Carolina Governor's School for Science and Mathematics, Hartsville, SC, <sup>2</sup>Clemson University, Clemson, SC**PS-9B-I-92 Mechanical Properties of Mesenchymal Cells during Vascular Smooth Muscle Cell Differentiation**M. M. TONEY<sup>1</sup>, A. LINDBURG<sup>1</sup>, AND D. DEAN<sup>1</sup><sup>1</sup>Clemson University, Clemson, SC**PS-9B-I-93 High-speed Scanning Control Algorithms for MEMS-based Confocal Image Acquisition**M. RAJ<sup>1</sup>, Y. WANG<sup>1</sup>, AND J. X. ZHANG<sup>1</sup><sup>1</sup>The University of Texas at Austin, Austin, TX**PS-9B-I-94 Direct Measurements of Nanoparticle and Cell Interactions using Atomic Force Microscopy**L. M. IKONOMOV<sup>1</sup>, W. MCALLISTER<sup>2</sup>, AND D. DEAN<sup>2</sup><sup>1</sup>Southside High School Center for International Studies, Greenville, SC, <sup>2</sup>Clemson University, Clemson, SC**PS-9B-I-95 Effect of X-Ray on Porcine Articular Cartilage Biomechanics**H. ROBERTS<sup>1</sup>, A. LINDBURG<sup>2</sup>, AND D. DEAN<sup>2</sup><sup>1</sup>South Carolina State University, Orangeburg, SC, <sup>2</sup>Clemson University, Clemson, SC**PS-9B-I-96 Effects of Ibotenic Acid Lesions of the Globus Pallidus on Sleep in the Rat**K. DZURISIN<sup>1</sup>, D. W. BARNETT<sup>2</sup>, AND A. M. ANCH<sup>2</sup><sup>1</sup>University of Akron, Parma, OH, <sup>2</sup>Saint Louis University, St. Louis, MO**PS-9B-I-97 Effects of Immobilized PDGF and VEGF on HUVEC Tubule Formation in Poly(ethylene glycol) Hydrogels**A. H. KESWANI<sup>1</sup>, J. E. SAIK<sup>1</sup>, AND J. L. WEST<sup>1</sup><sup>1</sup>Rice University, Houston, TX**PS-9B-I-98 Specificity and Safety of Drug (4-phenylbutyrate) Action in Cardiac Tissue**J. E. GUNTHER<sup>1</sup>, Z. JIA<sup>1</sup>, AND E. ENTCEVA<sup>1</sup><sup>1</sup>Stony Brook University, Stony Brook, NY**PS-9B-I-99 Measuring Periosteal Permeability in Frozen and Fresh Tibiae**X. ZHEN<sup>1</sup>, AND M. L. KNOTHE TATE<sup>2</sup><sup>1</sup>Worcester Polytechnic Institute, Worcester, MA, <sup>2</sup>Case Western Reserve University, Cleveland, OH**PS-9B-I-100 MOVED TO PS-7B-6-34****PS-9B-I-101 High Resolution Extended Field Imaging with Confocal Stage Scanning Microscopy**C. A. OLSOVSKY<sup>1</sup>, M. A. SALDUA<sup>1</sup>, AND K. C. MAITLAND<sup>1</sup><sup>1</sup>Texas A&M University, College Station, TX**PS-9B-I-102 Determining the Mechanical Role of Elastin and Collagen in Mouse Carotid Arteries**E. MARIN<sup>1</sup>, AND J. WAGENSEIL<sup>1</sup><sup>1</sup>Saint Louis University, St. Louis, MO**PS-9B-I-103 Quantitative Live Imaging of Avian Embryonic Morphogenesis via Micro-Computed Tomography**A. L. HENNING<sup>1</sup>, M. X. JIANG<sup>1</sup>, T. KAUSHIK<sup>1</sup>, M. RICCIO<sup>1</sup>, C. SCHAFFER<sup>1</sup>, M. JIN<sup>1</sup>, AND J. T. BUTCHER<sup>1</sup><sup>1</sup>Cornell University, Ithaca, NY**PS-9B-I-104 Scanning System Design and Synchronization for a Two-Photon and SHG Hybrid Confocal Microscope**L. SCHMIDT<sup>1</sup>, Y. SHAO<sup>2</sup>, R. WANG<sup>1</sup>, H. LIU<sup>1</sup>, AND B. GAO<sup>1</sup><sup>1</sup>Clemson University, Clemson, SC, <sup>2</sup>Shenzhen University, Shenzhen, Guangdong, China, People's Republic of**PS-9B-I-105 Developing a Glucose Biosensor for Monitoring Patients with Brain Injuries**L. WILES<sup>1</sup>, M. ROGERS<sup>2</sup>, AND M. BOUTELLE<sup>2</sup><sup>1</sup>Clemson University, Clemson, SC, <sup>2</sup>Imperial College London, London, United Kingdom**PS-9B-I-106 On-chip analysis of -factor induced mating response in *S. cerevisiae***E. CURTIS<sup>1</sup>, A. KOLE<sup>1</sup>, B. NGUYEN<sup>2</sup>, J. ENDERS<sup>1</sup>, T. GRAHAM<sup>1</sup>, K. SEALE<sup>1</sup>, J. MCLEAN<sup>1</sup>, AND J. WIKSWO<sup>1</sup><sup>1</sup>Vanderbilt University, Nashville, TN, <sup>2</sup>Belmont University, Nashville, TN**PS-9B-I-107 Novel Noninvasive Technique for Measurement of Change in Interstitial Fluid Volume**J. C. VO<sup>1</sup>, J. M. BARBA<sup>1</sup>, Q. T. NGUYEN<sup>1</sup>, R. M. DONGAONKAR<sup>1</sup>, R. H. STEWART<sup>1</sup>, G. A. LAINE<sup>1</sup>, AND C. M. QUICK<sup>1</sup><sup>1</sup>Michael E. DeBakey Institute, TX A&M University, College Station, TX**PS-9B-I-108 Tracking the CD95-Mediated Apoptotic Cascade in ARPE-19 Cells After Short Wavelength UV Irradiation**C. S. THOMPSON<sup>1</sup>, V. NGASSAM<sup>2</sup>, A. N. PARIKH<sup>2</sup>, AND A. E. OLIVER<sup>2</sup><sup>1</sup>Rice University, Houston, TX, <sup>2</sup>University of California, Davis, CA**PS-9B-I-109 Biodegradable Microparticle-Mediated Delivery of PAX3 Protein to Induce Myogenic Differentiation of Stem Cells**L. LIU<sup>1</sup>, C-W. CHANG<sup>1</sup>, AND S. VARGHESE<sup>1</sup><sup>1</sup>University of California, San Diego, La Jolla, CA

**PS-9B-I-110** Evaluation of Electrically Conductive Nanomaterials for Neural Engineering: Schwann Cells Exhibit a Differential Response to Single Walled Carbon Nanotubes in 2D versus 3DD. BOGDANOWICZ<sup>1</sup>, B. BEHAN<sup>1</sup>, D. DEWITT<sup>1</sup>, A. KOPPEL<sup>1</sup>, AND D. THOMPSON<sup>1</sup>  
<sup>1</sup>Rensselaer Polytechnic Institute, Troy, NY**PS-9B-I-111** Structure Based Design for Ultra Fast Acting Insulin AnalysisM. WEISS<sup>1</sup>, V. RAMANUJAM<sup>2</sup>, AND V. PANDAYARAJAN<sup>1</sup>  
<sup>1</sup>Case Western Reserve, Cleveland, OH, <sup>2</sup>Case Western Reserve, South Euclid, OH**PS-9B-I-112** Mechanisms Underlying Collective Cell Migration in VitroK. SUMMERS<sup>1</sup>, M. BINDSCHADLER<sup>1</sup>, H. CHUNG<sup>1</sup>, B. NEHILLA<sup>1</sup>, AND J. MCGRATH<sup>1</sup>  
<sup>1</sup>University of Rochester, Rochester, NY**PS-9B-I-113** Diagnostic Peptide-nanoparticle Probes for Multiplexed Profiling of Tumor Protease ActivityG. A. KWONG<sup>1</sup>, G. VON MALTZAHN<sup>1</sup>, O. ABUDAYYEH<sup>1</sup>, S. MO<sup>1</sup>, G. MURUGAPPAN<sup>1</sup>, I. PAPAYANNOPOULOS<sup>1</sup>, AND S. N. BHATIA<sup>1,2</sup>  
<sup>1</sup>Massachusetts Institute of Technology, Cambridge, MA, <sup>2</sup>Howard Hughes Medical Institute, Cambridge, MA**PS-9B-I-114** Design of a High Volumetric Mixer for a Continuous Microformulator DeviceW. J. MATLOFF<sup>1</sup>, J. SCHERRER<sup>1</sup>, R. REISERER<sup>1</sup>, K. SEALE<sup>1</sup>, AND J. WIKSWO<sup>1</sup>  
<sup>1</sup>Vanderbilt University, Nashville, TN**PS-9B-I-115** VASP Negatively Regulates Breast Cancer Cell Motility Utilizing Profilin ID. GAU<sup>1</sup>, Z. DING<sup>1</sup>, C. BATY<sup>1</sup>, AND P. ROY<sup>1</sup>  
<sup>1</sup>University of Pittsburgh, Pittsburgh, PA**PS-9B-I-116** Improving Clinical Balance Measures in Older Adults via Wii Fit TrainingN. M. DOLD<sup>1</sup>, AND K. A. BIERYLA<sup>1</sup>  
<sup>1</sup>Bucknell University, Lewisburg, PA**PS-9B-I-117** A Comparison of the Inflammation Response Among Novel Drug Eluting Stents (DES) and Bare Metal Stents by HistologyA. BURKHOLDER<sup>1</sup>, AND D. HOU<sup>2</sup>  
<sup>1</sup>Bucknell University, Lewisburg, PA, <sup>2</sup>Saint Josephs Translational Research Institute, Atlanta, GA**PS-9B-I-118T** Studying the Effects of Endothelial Progenitor Cells Upon Cardiomyocytes in a Microfluidic PlatformR. KORMAN<sup>1</sup>, S. FALEY<sup>1</sup>, K. SEALE<sup>1</sup>, AND A. HATZOPOULOS<sup>1</sup>  
<sup>1</sup>Vanderbilt University, Nashville, TN**PS-9B-I-119** Characterization of Graft Copolymers that Augment Delivery of Antisense OligodeoxynucleotidesR. CHOU<sup>1</sup>, L. PEDDADA<sup>2</sup>, AND C. ROTH<sup>2</sup>  
<sup>1</sup>University of Texas at Austin, Austin, TX, <sup>2</sup>Rutgers University, Piscataway, NJ**PS-9B-I-120** Development of pH-Responsive Nanoparticles for Targeted, Controlled Release of 5-FluorouracilR. L. SCHEUERLE<sup>1</sup>, M. C. MOORE<sup>1</sup>, AND N. A. PEPPAS<sup>1</sup>  
<sup>1</sup>The University of Texas at Austin, Austin, TX**PS-9B-I-121** Systematic Variation of ECM Modulates Adhesion and Migration Responses of Human Breast Cancer CellsL. E. FONG<sup>1</sup>, S. K. ALFORD<sup>1</sup>, S. R. PEYTON<sup>1</sup>, AND D. A. LAUFFENBURGER<sup>1</sup>  
<sup>1</sup>Massachusetts Institute of Technology, Cambridge, MA**PS-9B-I-122** In Vitro Characterization of Polysialic Acid Glycomimetics Immobilized on Collagen ScaffoldsI. J. PERRON<sup>1</sup>, S. MASAND<sup>1</sup>, AND D. I. SHREIBER<sup>1</sup>  
<sup>1</sup>Rutgers University, Piscataway, NJ**PS-9B-I-123** Simulated Overcrowding Extrudes Live Cells from an EpitheliumP. D. LOFTUS<sup>1</sup>, G. T. EISENHOFER<sup>2</sup>, AND J. ROSENBLATT<sup>2</sup>  
<sup>1</sup>University of Utah, Salt Lake City, UT, <sup>2</sup>Huntsman Cancer Institute, Salt Lake City, UT**PS-9B-I-124** Ultrasonic Nebulization as a Tool for Creating Multilayered, Multi-component Anti-Infective NanocoatingsM. COWDERY<sup>1</sup>, K. MCNAMARA<sup>2</sup>, Y. LVOV<sup>2</sup>, AND D. MILLS<sup>2</sup>  
<sup>1</sup>University of Puget Sound, Tacoma, WA, <sup>2</sup>Louisiana Tech University, Ruston, LA**PS-9B-I-125** The Effect of Pluronic and Hyperthermia on Cancer Cell PermeabilityJ. D. HUANG<sup>1</sup>, AND A. EXNER<sup>2</sup>  
<sup>1</sup>University Hospitals Case Medical Center, Shaker Heights, OH, <sup>2</sup>University Hospitals Case Medical Center, Cleveland, OH**PS-9B-I-126** The Use of Magnetic Nanoparticles for Antibacterial Properties and Increasing Osteoblast FunctionsJ. YOO<sup>1</sup>, H. F. TROSS<sup>1</sup>, E. N. TAYLOR<sup>1</sup>, AND T. J. WEBSTER<sup>1</sup>  
<sup>1</sup>Brown University, Providence, RI**PS-9B-I-127** The Inhibitory Effects of Magnetite Nanoparticles on Amyloid-beta Protein Fibril Formation in Alzheimer's DiseaseS. E. CHASTAIN<sup>1</sup>, D. SOTO-ORTEGA<sup>2</sup>, M. A. MOSS<sup>2</sup>, J. MANGUAL<sup>2</sup>, AND J. RITTER<sup>2</sup>  
<sup>1</sup>Newberry College, Newberry, SC, <sup>2</sup>University of South Carolina, Columbia, SC**PS-9B-I-28** A Novel Multichannel Telemetric System for Recording ECoG Activities in Freely Behaving AnimalsP. G. MCCORKLE<sup>1</sup>, A. FARAJIDAVAR<sup>1</sup>, T. W. WIGGINS<sup>1</sup>, AND J.-C. CHIAO<sup>1</sup>  
<sup>1</sup>University of Texas at Arlington, Arlington, TX**PS-9B-I-129** Assembly of Mirrored Pyramidal Wells and Their Application with MicroscopyL. QU<sup>1</sup>, K. QIN<sup>1</sup>, R. REISEIRER<sup>2</sup>, G. WRIGHT<sup>2</sup>, AND C. JANETOPOULOS<sup>2</sup>  
<sup>1</sup>Vanderbilt University, Nashville, TN, <sup>2</sup>Vanderbilt, Nashville, TN**PS-9B-I-130** Differentiation of Mouse Embryonic Stem Cells in Stirred Tank and Rotary Wall BioreactorsR. AMBLER<sup>1</sup>, K. FRIDLEY<sup>1</sup>, I. FERNANDEZ<sup>1</sup>, AND K. ROY<sup>1</sup>  
<sup>1</sup>University of Texas at Austin, Austin, TX**PS-9B-I-131** Role of Simvastatin Treatment on Epithelial Cell Injury During Cyclic Airway ReopeningG. EICKERT<sup>1</sup>, AND S. GHADIALI<sup>1</sup>  
<sup>1</sup>The Ohio State University, Columbus, OH**PS-9B-I-132** Controlled Release of Biomolecules From Silica Sol-gel Thin FilmsS. VAIDYANATHAN<sup>1</sup>, S. SOMMAKIA<sup>1</sup>, J. L. RICKUS<sup>1</sup>, AND K. J. OTTO<sup>1</sup>  
<sup>1</sup>Purdue University, West Lafayette, IN**PS-9B-I-133** Osteoblastic Response to Bioactive NanocoatingsK. MCNAMARA<sup>1</sup>, M. COWDERY<sup>2</sup>, Y. LVOV<sup>1</sup>, AND D. MILLS<sup>1</sup>  
<sup>1</sup>Louisiana Tech University, Ruston, LA, <sup>2</sup>University of Puget Sound, Tacoma, WA**PS-9B-I-134** Using Synthesized Porous Membranes to Induce Electroosmosis for Cell InjectionZ. W. JOHNSON<sup>1</sup>, P. HOBLITZELL<sup>2</sup>, X. SUN<sup>3</sup>, B. HINDS<sup>3</sup>, AND K. ANDERSON<sup>3</sup>  
<sup>1</sup>Valparaiso University, Valparaiso, IN, <sup>2</sup>University of Louisville, Louisville, KY, <sup>3</sup>University of Kentucky, Lexington, KY**PS-9B-I-135** Leukocyte Separation Using Cross Flow in a Microfluidic DeviceE. M. WERNER<sup>1</sup>, C. MARASCO<sup>1</sup>, AND K. T. SEALE<sup>1</sup>  
<sup>1</sup>Vanderbilt University, Nashville, TN**PS-9B-I-136** Areal Strain of Giant Unilamellar Vesicles in a Magnetic Force TransducerS. STRAIN<sup>1,2</sup>, D. STARK<sup>1</sup>, AND R. RAPHAEL<sup>1</sup>  
<sup>1</sup>Rice University, Houston, TX, <sup>2</sup>University of Texas, Austin, TX

**PS-9B-I-137** Pancreatic Digestive Enzymes Activity in the Ischemic IntestineH. TAM<sup>1</sup>, M. CHANG<sup>2</sup>, AND G. W. SCHMID-SCHÖNBEIN<sup>2</sup><sup>1</sup>Rose Hulman, Terre Haute, IN, <sup>2</sup>University of California San Diego, La Jolla, CA**PS-9B-I-138** Patient Specific Biomechanics Models of Surgical Ventricular Reconstruction SurgeryS. J. LIVNE<sup>1</sup>, A. MCCULLOCH<sup>2</sup>, AND D. HUNT<sup>2</sup><sup>1</sup>Tufts University, Medford, MA, <sup>2</sup>UCSD, La Jolla, CA**PS-9B-I-139** Nanoscale Surface Modification of the Skin-Implant Interface to Enhance Keratinocyte AttachmentS. MATTESSICH<sup>1</sup>, C. TING<sup>1</sup>, I. IVANOV<sup>1</sup>, A. KHAING<sup>1</sup>, T. CAMESANO<sup>1</sup>, C. LAMBERT<sup>1</sup>, W. MCGIMPSEY<sup>1</sup>, AND G. PINS<sup>1</sup><sup>1</sup>Worcester Polytechnic Institute, Worcester, MA**PS-9B-I-140** Activation Sequence Assessment Using Three-dimensional Isochronal Maps to Determine Effective Pacing Locations in a Diseased HeartM. CRUZ-ACUÑA<sup>1</sup>, E. J. HOWARD<sup>2</sup>, AND J. H. OMENS<sup>2</sup><sup>1</sup>University of Puerto Rico, Mayagüez Campus, Mayagüez, PR, Puerto Rico, <sup>2</sup>University of California, San Diego, CA**PS-9B-I-141** Design and Initial Performance of a Dedicated Cone-Beam CT Scanner for Musculoskeletal ExtremitiesY. DING<sup>1</sup>, W. ZBIJEWSKI<sup>1</sup>, P. DEJEAN<sup>1</sup>, P. PRAKASH<sup>1</sup>, J. W. STAYMAN<sup>1</sup>, N. PACKARD<sup>2</sup>, R. SENN<sup>2</sup>, D. YANG<sup>2</sup>, J. YORKSTON<sup>2</sup>, A. MACHADO<sup>1</sup>, J. CARRINO<sup>1</sup>, AND J. H. SIEWERDSEN<sup>1</sup><sup>1</sup>Johns Hopkins University, Baltimore, MD, <sup>2</sup>Carestream Health Inc., Rochester, NY**PS-9B-I-142** Collagen-binding Peptidoglycan's Influence on Fibrillogenesis & MechanicsA. K. RAMASWAMY<sup>1</sup>, J. PADERI<sup>1</sup>, K. STUART<sup>1</sup>, AND A. PANITCH<sup>1</sup><sup>1</sup>Purdue University, West Lafayette, IN**PS-9B-I-143** Quantifying Protein Kinase-Specific Phosphatase ActivityA. K. BOSE<sup>1</sup>, K. HOLMBERG<sup>1</sup>, AND K. JANES<sup>1</sup><sup>1</sup>University of Virginia, Charlottesville, VA**PS-9B-I-144** Decoupling PEG Hydrogel Modulus and Mesh Size Toward Rational Scaffold DesignB. GRIGORYAN<sup>1</sup>, D. MUNOZ-PINTO<sup>1</sup>, AND M. HAHN<sup>1</sup><sup>1</sup>Texas A&M University, College Station, TX**PS-9B-I-145** Development and Validation of a Bubble Trap for Long Term Cell Culture Within Microfluidic SystemsJ. E. SADEGHI<sup>1</sup>, D. A. MARKOV<sup>1</sup>, AND L. J. MCCAWLEY<sup>2</sup><sup>1</sup>Vanderbilt University, Nashville, TN, <sup>2</sup>Vanderbilt University Medical Center, Nashville, TN**PS-9B-I-146** The Effect of Media Dilution on Cell Growth Rate in *Saccharomyces cerevisiae*K. J. ROTH<sup>1</sup>, K. SEALE<sup>1</sup>, AND T. GRAHAM<sup>1</sup><sup>1</sup>Vanderbilt University, Nashville, TN**PS-9B-I-147** Low Intensity NIR Light Treatment for Attenuating Oxidative Stress induced by Amyloid Beta PeptideB. L. BUNGART<sup>1</sup>, AND J. LEE<sup>1</sup><sup>1</sup>University of Missouri, Columbia, MO**PS-9B-I-148** Development of Polymeric Microcapsules for Neural Stem Cell Culture and Tissue EngineeringK. L. BRIGGS<sup>1</sup>, C. B. HIGHLEY<sup>1</sup>, S. H. BAKHRU<sup>1</sup>, AND S. ZAPPE<sup>1</sup><sup>1</sup>Carnegie Mellon University, Pittsburgh, PA**PS-9B-I-149** Design and Optimization of a Diffusion-based Microfluidic Blood Filtration DeviceB. REINEMUND<sup>1</sup>, M. BENEFORD<sup>1</sup>, S. HONG<sup>1</sup>, J. KAMEOKA<sup>1</sup>, AND G. COTE<sup>1</sup><sup>1</sup>Texas A&M University, College Station, TX**PS-9B-I-150** A Novel Method for Measuring the Micromechanics of Soft Tissue using Digital Image CorrelationD. LEE<sup>1</sup>, M. MCDONOUGH<sup>1</sup>, M. PALIWAL<sup>1</sup>, AND K. YAN<sup>1</sup><sup>1</sup>The College of New Jersey, Ewing, NJ**PS-9B-I-151** Preparation of the Transmembrane Domain of APP Receptor in Native Membrane for Solid State NMRA. N. SANTIAGO-MIRANDA<sup>1</sup>, AND F. TIAN<sup>2</sup><sup>1</sup>University of Puerto Rico at Mayaguez, Toa Baja, PR, <sup>2</sup>Penn State College of Medicine, Hershey, PA**PS-9B-I-152** Investigation of the Effect of Cement Viscosity in TKA using Digital Image CorrelationK. ABBRUZZESE<sup>1</sup>, R. O'LAUGHLIN<sup>1</sup>, D. LEE<sup>1</sup>, M. PALIWAL<sup>1</sup>, AND D. G. ALLAN<sup>2</sup><sup>1</sup>The College of New Jersey, Ewing, NJ, <sup>2</sup>SIU School of Medicine, Springfield, IL**PS-9B-I-153** Building Mathematical Models for Nanoparticle-Induced Reactive Oxygen Species ProductionP. A. SMITH<sup>1</sup>, I. IVANOV<sup>1</sup>, AND C. M. SAYES<sup>1</sup><sup>1</sup>Texas A&M University, College Station, TX**PS-9B-I-154** Drugs Effect on the Dynamics of Stress Fiber Orientation under Cyclic StretchC. M. HAASE<sup>1</sup>, C-F. LEE<sup>1</sup>, M. ARCHIBONG<sup>2</sup>, AND R. R. KAUNAS<sup>1</sup><sup>1</sup>Texas A&M University, College Station, TX, <sup>2</sup>University of Florida, Tallahassee, FL**PS-9B-I-155** Young's Modulus of Multipotent Stem Cells from Different Age GroupsH. S. CHEUNG<sup>1</sup>, N. ZIEBARTH<sup>1</sup>, J. P. RUIZ<sup>1</sup>, AND D. PELAEZ<sup>1</sup><sup>1</sup>University of Miami, Coral Gables, FL**PS-9B-I-156** Validation of Suitable Endogenous Control Genes for Quantitative Real-Time PCR Studies of Human Abdominal Aortic Aneurysm TissueE. C. FLINCHBAUGH<sup>1,2</sup>, D. W. CHEW<sup>1,2</sup>, A. XAVIER<sup>1,2</sup>, D. CLEARY<sup>1,2</sup>, J. MUTHU<sup>1,2</sup>, AND D. A. VORP<sup>1,2</sup><sup>1</sup>University of Pittsburgh, Pittsburgh, PA, <sup>2</sup>McGowan Institute for Regenerative Medicine, Pittsburgh, PA**PS-9B-I-157** The Effects of Proton Radiation on UHMWPE Material Properties for Total Joint ReplacementsC. S. CUMMINGS<sup>1</sup>, E. M. LUCAS<sup>1</sup>, T. M. KIEU<sup>1</sup>, J. A. MARRO<sup>1</sup>, AND J. D. DESJARDINS<sup>1</sup><sup>1</sup>Clemson University, Clemson, SC**PS-9B-I-158** Re-design of a Mold for Cellular Aggregation to Create Smooth Muscle Tissue RingsB. ALPHONSE<sup>1</sup>, T. GWYTHYER<sup>2</sup>, J. HU<sup>2</sup>, AND M. W. ROLLE<sup>2</sup><sup>1</sup>University of Rhode Island, Kingston, RI, <sup>2</sup>Worcester Polytechnic Institute, Worcester, MA**PS-9B-I-159** Visualizing the Complex 3D Geometry of the Border Zone in Isolated Rabbit HeartS. VELAMAKANNI<sup>1</sup>, R. M. SMITH<sup>1</sup>, A. BLACK<sup>1</sup>, T. AKKIN<sup>1</sup>, AND E. G. TOLKACHEVA<sup>1</sup><sup>1</sup>University of Minnesota, Minneapolis, MN**PS-9B-I-160** A Protective Sheath for Stem Cell Delivery to the HeartK. M. VAZQUEZ<sup>1</sup>, N. DUFFY<sup>1</sup>, J. GUYETTE<sup>1</sup>, M. D. PHANEUF<sup>2</sup>, S. G. PATHAN<sup>2</sup>, S. M. ALI<sup>2</sup>, AND G. R. GAUDETTE<sup>1</sup><sup>1</sup>Worcester Polytechnic Institute, Worcester, MA, <sup>2</sup>BioSurface Inc, Ashland, MA**PS-9B-I-161** Distance Measurements for Automated High-Throughput Compound ScreeningN. R. LEWIS<sup>1</sup>, J. ROBINSON<sup>1</sup>, V. DAVISSON<sup>1</sup>, V. PATSEKIN<sup>1</sup>, R. FATIG<sup>1</sup>, B. RAJWA<sup>1</sup>, P. CARLSGAARD<sup>1</sup>, L. AVRAMOVA<sup>1</sup>, C. HOLDMAN<sup>1</sup>, K. RAGHEB<sup>1</sup>, P. RIGBY<sup>1</sup>, J. STURGIS<sup>1</sup>, AND A. JUAN-GARCIA<sup>1</sup><sup>1</sup>Purdue University, West Lafayette, IN**PS-9B-I-162** Peripheral Nerve Regeneration Using a Tension-inducing ScaffoldR. E. WILSON<sup>1,2</sup>, J. P. FISHER<sup>2</sup>, AND S. SHAH<sup>2</sup><sup>1</sup>Case Western Reserve University, Cleveland, OH, <sup>2</sup>University of Maryland, College Park, MD**PS-9B-I-163** Biological Sutures for Cell Delivery to the Heart: Assessment of Delivery ScaffoldS. ROWLINSON<sup>1</sup>, J. GUYETTE<sup>2</sup>, S. SHAW<sup>2</sup>, D. SOOD<sup>2</sup>, K. MINN<sup>2</sup>, A. DEMARTINO<sup>2</sup>, B. CHOATE<sup>2</sup>, A. KAZANOVICZ<sup>2</sup>, M. ROLLE<sup>2</sup>, G. PINS<sup>2</sup>, AND G. GAUDETTE<sup>2</sup><sup>1</sup>University of Miami, Coral Gables, FL, <sup>2</sup>Worcester Polytechnic Institute, Worcester, MA

**PS-9B-I-164** Palladium-Carbon Nanotube Electrocatalyst for Methanol Oxidation in Fuel CellsH. LIN<sup>1</sup>, Z. ZHU<sup>2</sup>, AND S. ZHOU<sup>2</sup><sup>1</sup>The Cooper Union, Manhattan, NY, <sup>2</sup>Worcester Polytechnic Institute, Worcester, MA**PS-9B-I-165** Effect of Reaction Conditions on Size and Yield of Poly(ethylene glycol) (PEG) MicrogelsJ. STUKEL<sup>1</sup>, AND R. WILLITS<sup>1,2</sup><sup>1</sup>Saint Louis University, St. Louis, MO, <sup>2</sup>University of Akron, Akron, OH**PS-9B-I-166** Adipose Progenitor Cells Promote Breast Cancer via their Extracellular MatrixJ. X. WANG<sup>1</sup>, E. M. CHANDLER<sup>1</sup>, AND C. FISCHBACH<sup>1</sup><sup>1</sup>Cornell University, Ithaca, NY**PS-9B-I-167** Dental Materials and Oral Bacterial InteractionH. SHIH<sup>1</sup>, K. S. GREGSON<sup>2</sup>, AND R. L. GREGORY<sup>2,3</sup><sup>1</sup>Indiana-University Purdue-University Indianapolis, Indianapolis, IN, <sup>2</sup>Indiana University School of Dentistry, Indianapolis, IN, <sup>3</sup>Tobacco Cessation and Biobehavioral Center, Indianapolis, IN**PS-9B-I-168** Characterization of a Flow Chamber to Examine Hemostasis and Thrombosis in Re-Circulating Blood FlowB. B. SHAH<sup>1</sup>, M. FRANCIS-SEDLAK<sup>2</sup>, M. CALT<sup>1</sup>, AND C. L. HALL<sup>1</sup><sup>1</sup>The College of New Jersey, Ewing, NJ, <sup>2</sup>Illinois Institute of Technology, Chicago, IL**PS-9B-I-169** Employing Chondroitin as an Enzyme EncapsulationB. MINDEN - BIRKENMAIER<sup>1</sup>, R. ARECHEDERRA<sup>1</sup>, AND S. MINTER<sup>1</sup><sup>1</sup>St. Louis University, St. Louis, MO**PS-9B-I-170** Endothelial Inflammation Response under Cyclic Stretch Profiles on Micro-patterned LinesP. MATHIEU<sup>1,2</sup>, M. ASMUTH<sup>3</sup>, AND B. HELMKE<sup>1</sup><sup>1</sup>University of Virginia, Charlottesville, VA, <sup>2</sup>North Carolina State University, Raleigh, NC, <sup>3</sup>Vanderbilt University, Nashville, TN**PS-9B-I-171** Diffusion Tensor Imaging Voxel-based Analysis of Pediatric Traumatic Brain InjuryK. W. AYOUB<sup>1,2</sup>, E. A. WILDE<sup>2</sup>, E. D. BIGLER<sup>3</sup>, Z. CHU<sup>4</sup>, T. C. WU<sup>5</sup>, J. V. HUNTER<sup>4</sup>, A. C. VASQUEZ<sup>2</sup>, AND H. S. LEVIN<sup>2</sup><sup>1</sup>Rice University, Houston, TX, <sup>2</sup>Baylor College of Medicine, Houston, TX, <sup>3</sup>Brigham Young University, Provo, TX, <sup>4</sup>Texas Childrens Hospital, Houston, TX, <sup>5</sup>Brigham Young University, Provo, UT**PS-9B-I-172** The Effect of Hypoxia on the Motion of Jurkat T-cells in a Multi-Trap NanophysiometerK. HOLUB<sup>1</sup>, A. DHUMMAKUP<sup>2</sup>, AND K. SEALE<sup>2</sup><sup>1</sup>Valparaiso University, Valparaiso, IN, <sup>2</sup>Vanderbilt University, Nashville, TN**PS-9B-I-173** Does Substrate Stiffness Influence Non-Viral Plasmid DNA Trafficking?R. W. DONNELLY<sup>1</sup>, M. HOTIC<sup>1</sup>, T. K. DEACY<sup>1</sup>, A. R. RUIZ<sup>1</sup>, AND R. C. GEIGER<sup>1</sup><sup>1</sup>Florida Gulf Coast University, U.A. Whitaker School of Engineering, Fort Myers, FL**PS-9B-I-174** Determining Optimal Cell Density and Oxygen Concentration for Encapsulated TissueD. SULLIVAN<sup>1</sup>, J. BLANCHETTE<sup>1</sup>, AND P. TOPIWALA<sup>1</sup><sup>1</sup>University of South Carolina, Columbia, SC**PS-9B-I-175** Characterization of Gold Nanoparticle-quantum Dot Assemblies and Their Potential Applications as BiosensorsE. L. PALMA<sup>1</sup>, A. STADLER<sup>2</sup>, P. SUN<sup>2</sup>, AND O. GANG<sup>2</sup><sup>1</sup>Stony Brook University, Stony Brook, NY, <sup>2</sup>Brookhaven National Laboratory, Upton, NY**PS-9B-I-176** Exploring the Dimensions of the Olfactory CodeG. SHAMSAN<sup>1</sup>, AND B. RAMAN<sup>1</sup><sup>1</sup>Washington University in St. Louis, St. Louis, MO**PS-9B-I-177** Multi-Step Development of Anatomical Urethane Phantoms for Optical ExperimentationC. GREGG<sup>1</sup>, J. RYAN<sup>1</sup>, K. POTERALA<sup>1</sup>, H. BABIKER<sup>1</sup>, D. COLLINS<sup>1</sup>, A. KREVER<sup>1</sup>, AND D. FRAKES<sup>1</sup><sup>1</sup>Arizona State University, Tempe, AZ**PS-9B-I-178** Digital Transcriptome Screening to Identify Universal Tumor Antigens for Mantle Cell LymphomaR. REKHI<sup>1</sup>, H. QIN<sup>2</sup>, AND L. KWAK<sup>2</sup><sup>1</sup>Rice University, Houston, TX, <sup>2</sup>MD Anderson Cancer Center, Houston, TX**PS-9B-I-179** Determination of Kinetic Parameters for Modeling Poly(ethylene glycol) Diacrylate Hydrogel FormationJ. JAMES<sup>1</sup>, C-Y. LEE<sup>1</sup>, M. TURTURRO<sup>1</sup>, F. TEYMOUR<sup>1</sup>, AND G. PAPAVALIOU<sup>1</sup><sup>1</sup>Illinois Institute of Technology, Chicago, IL**PS-9B-I-180** Phosphoproteomic Profiling & Conservation Analysis of Phosphotyrosine Sites in Renal Collecting DuctB. ZHAO<sup>1,2</sup>, T. PISITKUN<sup>2</sup>, C-L. CHOU<sup>2</sup>, AND M. A. KNEPPER<sup>2</sup><sup>1</sup>University of Michigan, Ann Arbor, MI, <sup>2</sup>National Heart, Lung, and Blood Institute, NIH, Bethesda, MD**PS-9B-I-181** Boronic Acid Functionalized Gold Nanoparticles for Determining Protein GlycationD. KIM<sup>1</sup>, C. ZHANG<sup>1</sup>, B. HAN<sup>1</sup>, AND V. PEREZ-LUNA<sup>1</sup><sup>1</sup>Illinois Institute of Technology, Chicago, IL**PS-9B-I-182** A Simple Mock Circulatory System for Testing Direct Mechanical Ventricular ActuationK. SWARTZMILLER<sup>1</sup>, B. SCHMITT<sup>1</sup>, D. REYNOLDS<sup>1</sup>, R. DARNER<sup>1</sup>, AND M. ANSTADT<sup>1</sup><sup>1</sup>Wright State University, Dayton, OH**PS-9B-I-183** Microfluidic Bandage for Localized Oxygen-Enhanced Wound HealingZ. H. MERCHANT<sup>1</sup>, J. LO<sup>2</sup>, AND D. T. EDDINGTON<sup>2</sup><sup>1</sup>University of Pennsylvania, Philadelphia, PA, <sup>2</sup>University of Illinois, Chicago, IL**PS-9B-I-184** Dependence of Stress on Geometry and Stiffness of Calcified Plaque in Arterial ModelsP. ROGERSON<sup>1</sup>, C. BUFFINTON<sup>1</sup>, AND D. EBENSTEIN<sup>1</sup><sup>1</sup>Bucknell University, Lewisburg, PA**PS-9B-I-185** High Speed Insertion Mechanics of Microelectrode Arrays for Implantable Neural ProsthesesB. LAU<sup>1</sup>, Y. XIAO<sup>2</sup>, AND M. HAN<sup>3</sup><sup>1</sup>University of California, Los Angeles, Los Angeles, CA, <sup>2</sup>University of California, Berkeley, Berkeley, CA, <sup>3</sup>Huntington Medical Research Institutes, Pasadena, CA**PS-9B-I-186** Mechanical Analysis of Cell Contracted Collagen for the Strengthening of Vascular GraftsS. R. SOOD<sup>1</sup>, D. SHREIBER<sup>1</sup>, AND I. GAUDET<sup>1</sup><sup>1</sup>Rutgers University, Piscataway, NJ**PS-9B-I-187** A Method for Measuring Hydrostatic Pressure in Microfluidic Devices by Compressibility of GasesK. ROMAN<sup>1</sup>, K. SEALE<sup>2</sup>, AND J. WIKSWO<sup>2</sup><sup>1</sup>Vanderbilt University, Madison, TN, <sup>2</sup>Vanderbilt University, Nashville, TN**PS-9B-I-188** Novel Parthenolide Delivery System for Acute Myeloid Leukemia TreatmentH. C. WATKINS<sup>1</sup>, AND D. BENOIT<sup>1</sup><sup>1</sup>University of Rochester, Rochester, NY**PS-9B-I-189** Optimizing the Temperature Gradients used in DNA Melting AnalysisD. P. SINGH<sup>1</sup>, AND N. CREWS<sup>1</sup><sup>1</sup>Louisiana Tech University, Ruston, LA**PS-9B-I-190** Investigation of Radical Production from Cells using EPR Spin TrappingR. CRUZ-ACUÑA<sup>1</sup>, AND F. VILLAMENA<sup>2</sup><sup>1</sup>University of Puerto Rico, Mayaguez, Puerto Rico, Puerto Rico, <sup>2</sup>The Ohio State University, Columbus, OH

**PS-9B-I-191** Methods of Enhancing Cell Viability in Three Dimensional Tissue EngineeringD. B. SNYDER<sup>1</sup>, AND S. WANG<sup>1</sup><sup>1</sup>Louisiana Tech University, Ruston, LA**PS-9B-I-192** Investigating Molecular Communication Between Microglia and CD4+ T-cells Using a Microfluidic PlatformL. E. CHATFIELD<sup>1</sup>, R. THOBHANI<sup>1</sup>, S. FALEY<sup>1</sup>, K. SEALE<sup>1</sup>, AND J. WIKSWO<sup>1</sup><sup>1</sup>Vanderbilt University, Nashville, TN**PS-9B-I-193** Effects of Left Ventricular Pacing Location on Cardiac Function in a Dyssynchronously Failing HeartR. M. LUEVANOS<sup>1</sup>, J. OMENS<sup>2</sup>, AND E. HOWARD<sup>2</sup><sup>1</sup>University of California Santa Barbara, La Jolla, CA, <sup>2</sup>University of California San Diego, San Diego, CA**PS-9B-I-194** The Effects of Increased Flow Rate on Jurkat T Cell Viability in the Multitrap NanophysiometerJ. IRVING<sup>1</sup>, AND J. KAPPA<sup>2</sup><sup>1</sup>University of Notre Dame, South Bend, IN, <sup>2</sup>Yale University, New Haven, CT**PS-9B-I-195** A Study of Hemorheological Disorders in Diabetic Patients with End Stage Renal DiseaseR. A. MUNOZ<sup>1</sup>, P. DHAR<sup>2</sup>, M. HAMMES<sup>3</sup>, AND K. CASSEL<sup>4</sup><sup>1</sup>University of Arizona, Tucson, Arizona, <sup>2</sup>Illinois Institute of Technology, Chicago, IL, <sup>3</sup>University of Chicago, Chicago, IL, <sup>4</sup>Illinois, Chicago, IL**PS-9B-I-196** Sensory Integration of Visual and Vestibular Cues in Recognition of Roll-tilt MotionA. ADATIA<sup>1,2</sup>, R. CLARET-YAKOVENKO<sup>2,3</sup>, F. KARMALI<sup>2,4</sup>, K. LIM<sup>2</sup>, AND D. MERFELD<sup>2,4</sup><sup>1</sup>University of Saskatchewan, Saskatoon, Saskatchewan, Canada, <sup>2</sup>Massachusetts Eye and Ear Infirmary, Boston, MA, <sup>3</sup>Swiss Federal Institute of Technology of Lausanne, Lausanne, Vaud, Switzerland, <sup>4</sup>Harvard Medical School, Cambridge, MA**PS-9B-I-197** Designing a Surface Eroding Multilayered Plasticized Film for Drug DeliveryR. VAN STELLE<sup>1</sup>, C. RABEK<sup>2</sup>, S. SUNDARARAJ<sup>2</sup>, D. PULEO<sup>2</sup>, AND T. DZIUBLA<sup>2</sup><sup>1</sup>Georgia Institute of Technology, Atlanta, GA, <sup>2</sup>University of Kentucky, Lexington, KY**PS-9B-I-198** Mapping Harmonic Response for Current-Control in Miniature Wireless Stimulators for Medical ApplicationsV. D. LOPEZ KLEIN<sup>1</sup>, B. TOWE<sup>1</sup>, D. GULICK<sup>1</sup>, AND P. LARSON<sup>1</sup><sup>1</sup>Arizona State University, Tempe, AZ**PS-9B-I-199** Assessing Intracellular Oxidative Stress in Co-Exposures of Carbon Black & Iron Oxide NanoparticlesS. H. HO<sup>1</sup>, J. M. BERG<sup>1</sup>, W. HWANG<sup>1</sup>, R. TAYLOR<sup>1</sup>, B. GUO<sup>1</sup>, AND C. M. SAYES<sup>1</sup><sup>1</sup>Texas A&M University, College Station, TX  
<sup>1</sup>Carnegie Mellon University, Pittsburgh, PA

**Track: Tissue Engineering \* – 9-1-1****Novel Biomaterials and Scaffolds - III**

**Chairs:** Stephanie Bryant, Sang Jin Lee  
Room 12A

**10:30AM OP-9-1-1A** Photopolymerizable Laminin-PEG Hydrogels for Intervertebral Disc Regeneration

A. T. FRANCISCO<sup>1</sup>, J. W. OGLE<sup>1</sup>, C. L. GILCHRIST<sup>1</sup>, J. CHEN<sup>1</sup>, S. L. CRAIG<sup>1</sup>, AND L. A. SETTON<sup>1</sup>

<sup>1</sup>Duke University, Durham, NC

**10:45AM OP-9-1-1B** In Situ Forming Transient-Network Hydrogels for Tissue Morphogenesis

B. LIU<sup>1</sup>, Y. LIU<sup>1</sup>, AND W. SHEN<sup>1</sup>

<sup>1</sup>University of Minnesota, Minneapolis, MN

**11:00AM OP-9-1-1C** Hydrogels with Time-Dependent Mechanical Properties Enhance Cardiomyocyte Differentiation In Vitro

J. L. YOUNG<sup>1</sup>, AND A. J. ENGLER<sup>1</sup>

<sup>1</sup>UC San Diego, La Jolla, CA

**11:15AM OP-9-1-1D** Click Chemistry for Synthesis of Modular Poly(ethylene glycol) (PEG) Scaffolds

P. K. NGUYEN<sup>1</sup>, AND D. L. ELBERT<sup>1</sup>

<sup>1</sup>Washington University in St. Louis, Saint Louis, MO

**11:30AM OP-9-1-1E** Tuning Mechanical Properties of Multiphoton-Fabricated, Biological Macromolecular Scaffolds

E. SPIVEY<sup>1</sup>, C. E. SCHMIDT<sup>1</sup>, AND J. B. SHEAR<sup>1</sup>

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

**11:45AM OP-9-1-1F** Fabrication of Chemoselectively Crosslinked Hydrogels via Staudinger Ligation

K. M. GATTAS-ASFURA<sup>1</sup>, AND C. L. STABLER<sup>1</sup>

<sup>1</sup>University of Miami, Miami, FL

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

**Track: Systems Biology, Bioinformatics and Computational Biology –9-1-2****Modeling of Biomolecules and Their Interactions**

**Chairs:** Rohit Pappu, Michael Schnieders  
Room 12B

**10:30AM OP-9-1-2A** SH1 Provides Additional Flexibility for the Rotation of Myosin VI's Converter Domain

Y. ZHANG<sup>1</sup>, AND J-C. LIAO<sup>1</sup>

<sup>1</sup>Columbia University, New York, NY

**10:45AM OP-9-1-2B** Development of Small Molecules Models for the AMOEBA Polarizable Force Field

J. C. WU<sup>1</sup>, AND P. Y. REN<sup>1</sup>

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

**11:00AM OP-9-1-2C** Editing and Aligning Complex Molecular Pathways Using 3D Models

B. YANKAMA<sup>1</sup>, R. UMETON<sup>1,2</sup>, S. AYYADURAI<sup>1</sup>, AND C. F. DEWEY<sup>1</sup>

<sup>1</sup>Massachusetts Institute of Technology, Cambridge, MA, <sup>2</sup>University of Calabria, Rende, CS, Italy

**11:15AM OP-9-1-2D** Monte Carlo Analysis of Neck Linker Extension in Native and Mutant Kinesin Molecular Motors

W. O. HANCOCK<sup>1</sup>, M. L. KUTYS<sup>1</sup>, AND J. FRICKS<sup>1</sup>

<sup>1</sup>Penn State University, University Park, PA

**11:30AM OP-9-1-2E** Systems Analysis of the Mechanisms of *Clostridium difficile* Toxins A and B

K. M. D'AURIA<sup>1</sup>, G. M. DONATO<sup>1</sup>, M. C. GRAY<sup>1</sup>, E. L. HEWLETT<sup>1</sup>, AND J. A. PAPIN<sup>1</sup>

<sup>1</sup>University of Virginia, Charlottesville, VA

**11:45AM OP-9-1-2F** A Parallel Approach to Creating a Quantitative Pathway Model for NO Production in Endothelial Cells

A. KOO<sup>1</sup>, A. SURENDRAN<sup>1,2</sup>, J. M. WENTZ<sup>1</sup>, M. I. LEGRAND<sup>1</sup>, J. E. YAZBEK<sup>1</sup>, AND C. F. DEWEY JR<sup>1</sup>

<sup>1</sup>Massachusetts Institute of Technology, Cambridge, MA, <sup>2</sup>National University of Singapore, Singapore, Singapore, Singapore

**Track: Biomedical Imaging and Optics – 9-1-3**  
**Biophotonics – II**

**Chairs:** Aydogan Ozcan, Chris Rylander  
Room 19A

**10:30AM OP-9-1-3A** Lensfree Differential Interference Contrast (DIC) Microscopy on a Chip

C. OH<sup>1</sup>, S. O. ISIKMAN<sup>1</sup>, M. LEE<sup>1</sup>, AND A. OZCAN<sup>1,2</sup>

<sup>1</sup>Electrical Engineering Department, University of California, Los Angeles, CA, <sup>2</sup>California NanoSystems Institute (CNSI), University of California, Los Angeles, CA

**10:45AM OP-9-1-3B** Ultra High-throughput Lensfree Fluorescent Imaging Using Compressive Sampling

A. F. COSKUN<sup>1</sup>, I. SENCAN<sup>1</sup>, T-W. SU<sup>1</sup>, AND A. OZCAN<sup>1</sup>

<sup>1</sup>UCLA Electrical Engineering Dept., Los Angeles, CA

**11:00AM OP-9-1-3C** Lensfree Color and Monochrome On-chip Imaging of *Caenorhabditis Elegans* Over a Wide Field-of-View

S. O. ISIKMAN<sup>1</sup>, I. SENCAN<sup>1</sup>, O. MUDANYALI<sup>1</sup>, W. BISHARA<sup>1</sup>, C. OZTOPRAK<sup>1</sup>, AND A. OZCAN<sup>1,2</sup>

<sup>1</sup>UCLA Electrical Engineering Dept., Los Angeles, CA, <sup>2</sup>California NanoSystems Institute (CNSI), University of California, Los Angeles, CA

**11:15AM OP-9-1-3D** A General and Label-Free Method for Assessing Cellular Attachment Using Photonic Crystal Biosensors

E. A. LIDSTONE<sup>1</sup>, V. CHAUDHRY<sup>1</sup>, A. KOHL<sup>1</sup>, L. TRUMP<sup>1</sup>, L. B. SCHOOK<sup>1</sup>, AND B. T. CUNNINGAM<sup>1</sup>

<sup>1</sup>University of Illinois at Urbana-Champaign, Urbana, IL

**11:30AM OP-9-1-3E** Multiplexed and Reiterative Fluorescence Labeling via DNA-Circuit Technologies

D. Y. DUOSE<sup>1</sup>, R. M. SCHWELLER<sup>1</sup>, W. N. HITTELMAN<sup>2</sup>, AND M. R. DIEHL<sup>1</sup>

<sup>1</sup>Rice University, Houston, TX, <sup>2</sup>M.D Anderson Cancer Center, Houston, TX

**11:45AM OP-9-1-3F** Lensfree Incoherent Microscopy on Nano-Structured Chips

B. KHADEMOSSEINIEH<sup>1</sup>, I. SENCAN<sup>1</sup>, G. BIENER<sup>1</sup>, T-W. SU<sup>1</sup>, A. COSKUN<sup>1</sup>, D. TSENG<sup>1</sup>, AND A. OZCAN<sup>1,2</sup>

<sup>1</sup>UCLA, Los Angeles, CA, <sup>2</sup>California NanoSystems Institute, Los Angeles, CA

**Track: Neural Engineering – 9-1-4****Neural Control of Movement**

**Chairs:** Robert Kirsch, Brian Schmitt  
Room 19B

**10:30AM OP-9-1-4A** Enhancing the Performance of an Upper Extremity FES System via Feedback and a Mobile Arm Support

S. SOLANKI<sup>1</sup>, AND R. F. KIRSCH<sup>1,2</sup>

<sup>1</sup>Case Western Reserve University, Cleveland, OH, <sup>2</sup>Cleveland Functional Electrical Simulation Center, Cleveland, OH

**10:45AM OP-9-1-4B** Trunk Dynamics in Response to Position Perturbations

E. MILLER<sup>1</sup>, B. BAZRGARI<sup>2</sup>, B. HENDERSHOT<sup>1</sup>, M. NUSSBAUM<sup>2</sup>, AND M. MADIGAN<sup>2</sup>  
<sup>1</sup>Virginia Tech - Wake Forest, Blacksburg, VA, <sup>2</sup>Virginia Tech, Blacksburg, VA

**11:00AM OP-9-1-4C** Decoding of Arm End Point Trajectory Using Local Field Potentials from Primate Primary Motor Cortex

M. MOLLAZADEH<sup>1</sup>, V. AGGARWAL<sup>1</sup>, A. LAW<sup>2</sup>, A. DAVIDSON<sup>2</sup>, M. SCHIEBER<sup>2</sup>, AND N. THAKOR<sup>1</sup>  
<sup>1</sup>Johns Hopkins University, Baltimore, MD, <sup>2</sup>University of Rochester, Rochester, NY

**11:15AM OP-9-1-4D** Spike Distribution Analysis of Surface EMG from Stroke Survivors

X. LI<sup>1</sup>, N. SURESH<sup>1</sup>, F. J. NEZHAD<sup>1</sup>, W. Z. RYMER<sup>1,2</sup>, AND P. ZHOU<sup>1,2</sup>  
<sup>1</sup>Rehabilitation Institute of Chicago, Chicago, IL, <sup>2</sup>Northwestern University, Chicago, IL

**11:30AM OP-9-1-4E** Role of Tendon Vibration in Multijoint Reflex Coupling of the Hemiparetic Arm Post Stroke

B. GADHOKE<sup>1</sup>, AND B. D. SCHMIT<sup>1</sup>  
<sup>1</sup>Marquette University, Milwaukee, WI

**11:45AM OP-9-1-4F** Recording Swallowing Patterns for Activating a Functional Electrical Stimulation System for Dysphagia

A. J. HADLEY<sup>1,2</sup>, K. KRIVAL<sup>3</sup>, AND D. TYLER<sup>1,2</sup>  
<sup>1</sup>Case Western Reserve University, Cleveland, OH, <sup>2</sup>Functional Electrical Stimulation Center, Cleveland, OH, <sup>3</sup>Kent State University, Kent, OH

**Track: Cellular and Molecular Engineering – 9-1-5 Molecular Engineering – III**

**Chairs:** Jennifer Maynard, Jonathan Silberg  
 Room 18A

**10:30AM OP-9-1-5A** Parallel “One-Pot” Synthesis of Synthetic Genes that Encode Protein Polymers

M. AMIRAM<sup>1</sup>, F. GARCIA QUIROZ<sup>1</sup>, AND A. CHILKOTI<sup>1</sup>  
<sup>1</sup>Duke University, Durham, NC

**10:45AM OP-9-1-5B** Engineering a Human Methionine Lyase as a Cancer Therapeutic

O. M. PALEY<sup>1</sup>, E. STONE<sup>1</sup>, B. EKERDT<sup>1</sup>, S. YANG<sup>1</sup>, AND G. GEORGIU<sup>1</sup>  
<sup>1</sup>University of Texas, Austin, Austin, TX

**11:00AM OP-9-1-5C** Hydrogel Encapsulated Glucose Oxidase: Effect on Cell Growth and Proliferation

R. M. KHAN<sup>1</sup>, A. GUISEPPi-ELIE<sup>2</sup>, AND P. VADGAMA<sup>1</sup>  
<sup>1</sup>Queen Mary University of London, London, United Kingdom, <sup>2</sup>Clemson University, Clemson, SC

**11:15AM OP-9-1-5D** Light-induced Activation of Caged Morpholino Oligonucleotides in Embryonic Zebrafish

C. M. JARREAU<sup>1</sup>, E. MENELAU<sup>1</sup>, K. SVOBODA<sup>1</sup>, AND T. MONROE<sup>1</sup>  
<sup>1</sup>Louisiana State University, Baton Rouge, LA

**11:30AM OP-9-1-5E** Molecular Mechanisms of Radiation-Induced Brain Injury for Treatment of Brain Tumor Patients

W. H. LEE<sup>1</sup>, W. E. SONNTAG<sup>2</sup>, AND Y. W. LEE<sup>1</sup>  
<sup>1</sup>Virginia Tech-Wake Forest University, Blacksburg, VA, <sup>2</sup>University of Oklahoma Health Sciences Center, Oklahoma City, OK

**11:45AM OP-9-1-5F** Modulation of Binding Site Density on an Elastic Fiber by Cyclic Stretch

S. AMIN<sup>1</sup>, A. MAJUMDAR<sup>1</sup>, AND B. SUK<sup>1</sup>  
<sup>1</sup>Boston University, Boston, MA

**Track: Cellular and Molecular Engineering – 9-1-6 Cell Motility**

**Chairs:** Amina Qutub, Maribel Vazquez  
 Room 18B

**10:30AM OP-9-1-6A** Stem Cells Migrate and then Differentiate on Matrices with Physiological Elasticity Gradients

J. R. TSE<sup>1</sup>, AND A. J. ENGLER<sup>1</sup>  
<sup>1</sup>University of California, San Diego, La Jolla, CA

**10:45AM OP-9-1-6B** - Endothelial Progenitors Migrate More Efficiently Than Adult Endothelial Cells: Role of SM22/Transgelin

L. MOLDOVAN<sup>1</sup>, AND N. I. MOLDOVAN<sup>1</sup>  
<sup>1</sup>Davis Heart and Lung Research Institute, The Ohio State University, Columbus, OH

**11:00AM OP-9-1-6C** - Cell-Cell Adhesion Between Invasive Cells Promotes Persistent Cell Migration in a Three-Dimensional Matrix

W. SHIH<sup>1</sup>, AND S. YAMADA<sup>1</sup>  
<sup>1</sup>University of California, Davis, CA

**11:15AM OP-9-1-6D** Epidermal Growth Factor Regulates Medulloblastoma *In Vitro* Migration

V. DUDU<sup>1</sup>, V. ROTARI<sup>1</sup>, Q. KONG<sup>2</sup>, AND M. VAZQUEZ<sup>1</sup>  
<sup>1</sup>City College of New York, New York, NY, <sup>2</sup>University of Illinois at Urbana-Champaign, Urbana, IL

**11:30AM OP-9-1-6E** Dynamic Actin Densities in the Axon of Sensory Neurons

J. CHETTA<sup>1</sup> AND S. SHAH<sup>1</sup>  
<sup>1</sup>University of Maryland, College Park, MD

**11:45AM OP-9-1-6F** Mechanics of Leukocyte Transmigration through Endothelial Cell Monolayers

K. M. STROKA<sup>1</sup>, AND H. ARANDA-ESPINOZA<sup>1</sup>  
<sup>1</sup>University of Maryland, College Park, MD

**Track: Cardiovascular Engineering – 9-1-7****Vascular Structure and Function II: Growth and Remodeling**

**Chairs:** Jessica Wagenseil, David Vorp  
 Room 18C

**10:30AM OP-9-1-7A** Mechanics of Developing Arteries with Reduced Elastin Amounts

V. LE<sup>1</sup>, AND J. WAGENSEIL<sup>1</sup>  
<sup>1</sup>Saint Louis University, St. Louis, MO

**10:45AM OP-9-1-7B** Three-Dimensional Microscopy to Study Regional Microstructural Changes during Aneurysm Development

S. SAATCHI<sup>1</sup>, J. AZUMA<sup>1</sup>, N. WANCHOO<sup>1</sup>, P. S. TSAO<sup>1</sup>, S. J. SMITH<sup>1</sup>, P. G. YOCK<sup>1</sup>, AND C. A. TAYLOR<sup>1</sup>  
<sup>1</sup>Stanford University, Stanford, CA

**11:00AM OP-9-1-7C** Association of Wall Strength of Ascending Thoracic Aneurysms with Different Aortic Valve Morphologies

J. E. PICHAMUTHU<sup>1,2</sup>, J. A. PHILLIPPI<sup>1,3</sup>, T. G. GLEASON<sup>1,3</sup>, AND D. A. VORP<sup>1,2</sup>  
<sup>1</sup>University of Pittsburgh, Pittsburgh, PA, <sup>2</sup>McGowan Institute for Regenerative Medicine, Pittsburgh, PA, <sup>3</sup>HLESI, Pittsburgh, PA

**11:15AM OP-9-1-7D** Comparison of the Postnatal Somatic Growth Patterns between the Pulmonary Trunk and Ascending Aorta

B. FATA<sup>1</sup>, D. GOTTLIEB<sup>2</sup>, A. COIS<sup>3</sup>, G. STETTEN<sup>1</sup>, J. MAYER<sup>2</sup>, AND M. SACKS<sup>1</sup>  
<sup>1</sup>University of Pittsburgh, Pittsburgh, PA, <sup>2</sup>Children's Hospital of Boston, Harvard Medical School, Boston, MA, <sup>3</sup>Carnegie Mellon University, Pittsburgh, PA

**11:30AM OP-9-1-7E** A New Constitutive Model of Arterial Wall Based on Finite-Strain Micromechanical MethodH. CHEN<sup>1</sup>, Y. LIU<sup>1</sup>, X. ZHAO<sup>1</sup>, AND G. S. KASSAB<sup>1</sup><sup>1</sup>Indiana University-Purdue University, Indianapolis, IN**11:45AM OP-9-1-7F** The Mechanical Behavior of Arteries Under TorsionS. D. LAMM<sup>1</sup>, J. R. GARCIA<sup>1</sup>, AND H-C. HAN<sup>1</sup><sup>1</sup>University of Texas at San Antonio, San Antonio, TX**Track: Cardiovascular Engineering – 9-1-8****Cardiovascular Computational Modeling and Measurement – II****Chairs:** Todd Doehring, George Engelmayr**Room 18D****10:30AM OP-9-1-8A** Simulations of Anisotropic Cardiac Tissue Formation Within Accordion-like Honeycomb ScaffoldsA. JEAN<sup>1</sup>, A. PARKAR<sup>1</sup>, N. MASOUMI<sup>1</sup>, AND G. C. ENGELMAYR<sup>1</sup><sup>1</sup>The Pennsylvania State University, University Park, PA**10:45AM OP-9-1-8B** Effect of Smooth Muscle Contraction on Residual Stress in the Canine Aorta: an Experimental and Numerical StudyC. BELLINI<sup>1</sup>, AND E. S. DI MARTINO<sup>1</sup><sup>1</sup>University of Calgary, Calgary, Alberta, Canada**11:00AM OP-9-1-8C** Mathematical Modeling of Transendothelial Water Transport and the Resulting Oncotic Paradox: Possible Link to Early Atherosclerosis?S. JOSHI<sup>1</sup>, K-M. JAN<sup>2</sup>, AND D. RUMSCHITZKI<sup>1</sup><sup>1</sup>City College of New York, New York, NY, <sup>2</sup>College of Physician and Surgeons, New York, NY**11:15AM OP-9-1-8D** Modeling Blood Flow and Pressure Waves in Arteries incorporating a Viscoelastic Wall ModelR. RAGHU<sup>1</sup>, AND C. TAYLOR<sup>1</sup><sup>1</sup>Stanford University, Stanford, CA**11:30AM OP-9-1-8E** Fully automated 3D mesh Generation from Multi-domain Voxel ImagesT. C. DOEHRING<sup>1</sup><sup>1</sup>Drexel University, Philadelphia, PA**11:45AM OP-9-1-8F** Numerical Study of Blood Flow after Embolization of Cerebral Aneurysm with Yield Stress FluidsW. WANG<sup>1</sup>, F. GRAZIANO<sup>2</sup>, V. M. RUSSO<sup>2</sup>, AND D. B. KHISMATULLIN<sup>1</sup><sup>1</sup>Tulane University, New Orleans, LA, <sup>2</sup>Louisiana State University Health Sciences Center, New Orleans, LA**Track: Respiratory Engineering - 9-1-9****Acute Lung Injury from Cell to System****Chairs:** Konstantin G. Burukov, Susan Marguiles**Room 17A****10:30AM OP-9-1-9A** Role of MicroRNAs in Regulating Mechanically Induced Inflammation in Human Alveolar Epithelial CellsY. HUANG<sup>1</sup>, M. CRAWFORD<sup>2</sup>, P. NANA-SINKAM<sup>2</sup>, AND S. GHADIALI<sup>1</sup><sup>1</sup>Biomedical Engineering, Columbus, OH, <sup>2</sup>Department of Internal Medicine, Columbus, OH**10:45AM OP-9-1-9B** Expanding on Lung SlicesS. UHLIG<sup>1</sup>, C. MARTIN<sup>1</sup>, S. RAUSCH<sup>2</sup>, R. METZKE<sup>2</sup>, O. PACK<sup>1</sup>, AND W. WALL<sup>2</sup><sup>1</sup>RTWH Aachen University, Aachen, NRW, Germany, <sup>2</sup>Technische Universitaet Muenchen, Garching, Bavaria, Germany**11:00AM OP-9-1-9C** Epac-Rap I Mechanism in Modulation of Acute Lung Injury: From Cell to SystemK. BIRUKOV<sup>1</sup><sup>1</sup>The University of Chicago, Chicago, IL**11:15AM OP-9-1-9D** MRI-based Assessment of Aerosol Deposition in the Rat Lung in Health and DiseaseC. DARQUENNE<sup>1</sup>, J. M. OAKES<sup>1</sup>, AND M. SCADENG<sup>1</sup><sup>1</sup>University of California, San Diego, La Jolla, CA**11:30AM OP-9-1-9E** High Magnitude Stretch Decreases MLC Phosphorylation in Alveolar EpitheliaB. C. DI PAOLO<sup>1</sup>, AND S. S. MARGULIES<sup>1</sup><sup>1</sup>University of Pennsylvania, Philadelphia, PA**11:45AM OP-9-1-9F** Changes in Cell Mechanics During Airway Reopening Alter Pulmonary Epithelial Barrier FunctionA-M. JACOB<sup>1</sup>, AND D. P. GAVER<sup>1</sup><sup>1</sup>Tulane University, New Orleans, LA**Track: Orthopedic and Rehabilitation Engineering – 9-1-10****Orthopedic Soft Tissue Biomechanics****Chairs:** Stefan Duma, Johnna Temenoff**Room 17B****10:30AM OP-9-1-10A** Three-dimensional Collagen Fiber Kinematics in Collagen Gels Subjected to IndentationS. P. LAKE<sup>1</sup>, AND V. H. BAROCAS<sup>1</sup><sup>1</sup>University of Minnesota, Minneapolis, MN**10:45AM OP-9-1-10B** Effect of Cyclic Compressive Loading on Muscle Mechanical Properties Following Eccentric ExerciseC. M. HAAS<sup>1</sup>, F. HAO<sup>1</sup>, Y. ZHAO<sup>1</sup>, T. A. BUTTERFIELD<sup>2</sup>, AND T. M. BEST<sup>1</sup><sup>1</sup>The Ohio State University, Columbus, OH, <sup>2</sup>University of Kentucky, Lexington, KY**11:00AM OP-9-1-10C** Contributions of Neural Tone to Muscle-Tendon Unit Stress-Relaxation Biomechanical PropertiesS. MANNAVA<sup>1,2</sup>, W. F. WIGGINS<sup>1,2</sup>, J. STITZEL<sup>2</sup>, M. F. CALLAHAN<sup>1</sup>, L. A. KOMAN<sup>1</sup>, T. L. SMITH<sup>1</sup>, AND C. J. TUOHY<sup>1</sup><sup>1</sup>Wake Forest University School of Medicine, Winston Salem, NC, <sup>2</sup>Wake Forest University Graduate School of Arts and Sciences, Winston Salem, NC**11:15AM OP-9-1-10D** Analysis of Spatiotemporal Changes in Elasticity of Developing Tendon using Atomic Force MicroscopyJ. E. MARTURANO<sup>1</sup>, J. D. ARENA<sup>1</sup>, AND C. K. KUO<sup>1</sup><sup>1</sup>Tufts University, Medford, MA**11:30AM OP-9-1-10E** Damage Evolution Process in LigamentsZ. GUO<sup>1</sup>, J. BARRETT<sup>2</sup>, AND R. DE VITA<sup>1</sup><sup>1</sup>Virginia Tech, Blacksburg, VA, <sup>2</sup>Virginia-Maryland College of Veterinary Medicine, Leesburg, VA**11:45AM OP-9-1-10F** Passive Tension in Supraspinatus Following Rotator Cuff Repair: A Simulation AnalysisK. SAUL HOLZBAUR<sup>1,2</sup>, S. HAYON<sup>3</sup>, T. SMITH<sup>1</sup>, C. TUOHY<sup>1</sup>, AND S. MANNAVA<sup>1</sup><sup>1</sup>Wake Forest University School of Medicine, Winston-Salem, NC, <sup>2</sup>VT-WFU School of Biomedical Engineering and Sciences, Winston-Salem, NC, <sup>3</sup>Wake Forest University, Winston-Salem, NC



**Track: Devices: Nano to Micro – 9-1-I1****Drug Delivery Technologies: Nano to Micro Devices – II****Chairs:** Christine Trinkle, Jennifer West**Room 16A****10:30AM OP-9-1-11A** A Mechanically Robust Nanofluidic Membrane with Tunable Zero-order Release for Implantable Dose Specific Drug DeliveryD. FINE<sup>1</sup>, A. GRATTONI<sup>1</sup>, S. HOSAL<sup>2</sup>, A. ZIEMYS<sup>1</sup>, E. DE ROSA<sup>1</sup>, J. GILL<sup>1</sup>, M. KOJIC<sup>1</sup>, R. MEDEMA<sup>2</sup>, M. MILOSEVIC<sup>3</sup>, L. BROUSSEAU, III<sup>1</sup>, L. HUDSON<sup>2</sup>, R. GOODALL<sup>2</sup>, M. FERRARI<sup>1,4</sup>, AND X. LIU<sup>1</sup><sup>1</sup>The University of Texas Health Science Center at Houston, Houston, TX, <sup>2</sup>NanoMedical Systems, Inc., Austin, TX, <sup>3</sup>R & D Center for Bioengineering, Kragujevac, Šumadija, Serbia, <sup>4</sup>The University of Texas M.D. Anderson Cancer Center, Houston, TX**10:45AM OP-9-1-11B** Size and Shape effects in the vascular dynamics of nano-Particle Systems (nPSs)S. LEE<sup>1</sup>, F. GENTILE<sup>2</sup>, A. VAN DE VEN<sup>3</sup>, M. FERRARI<sup>3</sup>, AND P. DECUZZI<sup>3</sup><sup>1</sup>University of Texas at Austin, Austin, TX, <sup>2</sup>University of Magna Graecia at Catanzaro, Catanzaro, Italy, <sup>3</sup>The University of Texas Medical School at Houston, Houston, TX**11:00AM OP-9-1-11C** Mucus-penetrating Particles Achieve Prolonged Retention and Improved Distribution in the Mouse VaginaY-Y. WANG<sup>1</sup>, S. K. LAI<sup>1</sup>, L. ENSIGN<sup>1</sup>, R. CONE<sup>1</sup>, AND J. HANES<sup>1</sup><sup>1</sup>The Johns Hopkins University, Baltimore, MD**11:15AM OP-9-1-11D** Silicon Nanowires Improve Adhesion *In Vitro* and *In Vivo* by Triggering Active Cell RemodelingK. E. FISCHER<sup>1</sup>, R. H. DANIELS<sup>2</sup>, E. LI<sup>2</sup>, V. COWLES<sup>3</sup>, J. L. MILLER<sup>3</sup>, AND T. A. DESAI<sup>1</sup><sup>1</sup>UCSF, San Francisco, CA, <sup>2</sup>Nanosys, Inc, Palo Alto, CA, <sup>3</sup>Depomed, Menlo Park, CA**11:30AM OP-9-1-11E** Development of a Nano/Micro Particle Protein Delivery SystemJ. COLEMAN<sup>1</sup>, AND A. LOWMAN<sup>1</sup><sup>1</sup>Drexel University, Philadelphia, PA**11:45AM OP-9-1-11F** Thermoresponsive Nanocomposite Double Network Hydrogels with Cell-Releasing BehaviorR. FEI<sup>1</sup>, J. T. GEORGE<sup>1</sup>, AND M. A. GRUNLAN<sup>1</sup><sup>1</sup>Texas A&M University, College Station, TX**Track: Devices: Nano to Micro - 9-1-I2****Micro and Nanostructured Biomaterials - II****Chairs:** Sanjay Kumar, Christine Trinkle**Room 16B****10:30AM OP-9-1-12A** Design of Biodegradable Gold Nanoclusters for NIR Optical ImagingA. K. MURTHY<sup>1</sup>, J. M. TAM<sup>1</sup>, J. O. TAM<sup>1</sup>, D. INGRAM<sup>1</sup>, M. SCHULZE<sup>1</sup>, R. NGUYEN<sup>1</sup>, L. L. MA<sup>1</sup>, K. V. SOKOLOV<sup>1</sup>, AND K. P. JOHNSTON<sup>1</sup><sup>1</sup>University of Texas at Austin, Austin, TX**10:45AM OP-9-1-12B** Multifaceted Nano- and Micropatterned Surfaces Created with Laser Scanning LithographyJ. H. SLATER<sup>1</sup>, J. S. MILLER<sup>2</sup>, S. S. YU<sup>3</sup>, AND J. L. WEST<sup>1</sup><sup>1</sup>Rice University, Houston, TX, <sup>2</sup>University of Pennsylvania, Philadelphia, PA, <sup>3</sup>Vanderbilt University, Nashville, TN**11:00AM OP-9-1-12C** Single Walled Carbon Nanotube Peapods as Photothermal Agents for Laser Cancer TherapyJ. WHITNEY<sup>1</sup>, J. ZHANG<sup>1</sup>, S. NAHA<sup>2</sup>, S. TORTI<sup>3</sup>, H. DORN<sup>1</sup>, AND M. N. RYLANDER<sup>1</sup><sup>1</sup>Virginia Tech, Blacksburg, VA, <sup>2</sup>ADA Technologies, Littleton, CO, <sup>3</sup>Wake Forest University, Winston-Salem, NC**11:15AM OP-9-1-12D** Multifunctional Virus-based Scaffold for Targeted *In Vivo* MR Imaging of Prostate CancerD. GHOSH<sup>1,2</sup>, Y. LEE<sup>1</sup>, A. KOHLI<sup>1,2</sup>, K. A. KELLY<sup>3</sup>, AND A. BELCHER<sup>1,2</sup><sup>1</sup>Massachusetts Institute of Technology, Cambridge, MA, <sup>2</sup>Koch Institute of Integrative Cancer Research, MA Institute of Technology, Cambridge, MA, <sup>3</sup>University of Virginia, Charlottesville, VA**11:30AM OP-9-1-12E** A New Model of Iron Oxide Nanoparticle Magnetic Properties to Guide Design of Novel NanomaterialsR. A. ORTEGA<sup>1,2</sup>, S. S. YU<sup>1,2</sup>, AND T. D. GIORGIO<sup>1,3</sup><sup>1</sup>Vanderbilt University Department of Biomedical Engineering, Nashville, TN, <sup>2</sup>Vanderbilt Institute of Nanoscale Science and Engineering, Nashville, TN, <sup>3</sup>Vanderbilt University Department of Chemical and Biomolecular Engineering, Nashville, TN**11:45AM OP-9-1-12F** Monodisperse, Stable Nanoparticles based on Amphiphilic Peptide-Polymer ConjugatesT. XU<sup>1</sup><sup>1</sup>University of California, Berkeley, Berkeley, ca**Track: Drug Delivery Systems \* – 9-1-I3****Novel Materials & Self-Assembling Systems: Peptide and Protein Delivery****Chairs:** Jordan Green, Jung Suh**Room 14****10:30AM OP-9-1-13A** Antimicrobial Peptide Delivery and Surface CoatingsA. SHUKLA<sup>1</sup>, A. C. ENGLER<sup>1</sup>, AND P. T. HAMMOND<sup>1</sup><sup>1</sup>Massachusetts Institute of Technology, Cambridge, MA**10:45AM OP-9-1-13B** Polymeric Nanoparticles for Anti-angiogenic Peptide DeliveryR. B. SHMUELI<sup>1</sup>, J. E. KOSKIMAKI<sup>1</sup>, J. SUNSHINE<sup>1</sup>, P. A. CAMPOCHIARO<sup>1</sup>, A. S. POPEL<sup>1</sup>, AND J. J. GREEN<sup>1</sup><sup>1</sup>Johns Hopkins University, Baltimore, MD**11:00AM OP-9-1-13C** Exploring Multi-Domain Peptides and Gelatin Microparticles as an Osteogenic Factor Delivery SystemD. M. YOON<sup>1</sup>, B. Y. LU<sup>1</sup>, E. L. BAKOTA<sup>1</sup>, F. KASPER<sup>1</sup>, J. D. HARTGERINK<sup>1</sup>, AND A. G. MIKOS<sup>1</sup><sup>1</sup>Rice University, Houston, TX**11:15AM OP-9-1-13D** Low Viscosity Highly Concentrated Dispersions of Stable IgG Particles Formed by SWIFT FreezingM. A. MILLER<sup>1</sup>, B. WILSON<sup>1</sup>, J. MAYNARD<sup>1</sup>, AND K. P. JOHNSTON<sup>1</sup><sup>1</sup>The University of Texas at Austin, Austin, TX**11:30AM OP-9-1-13E** GLP-1 polymer Drug Depots for Treatment of Type-2 DiabetesM. AMIRAM<sup>1</sup>, AND A. CHILKOTI<sup>1</sup><sup>1</sup>Duke University, Durham, NC**11:45AM OP-9-1-13F** Swelling and Insulin Release of Glucose-Responsive Microparticles and NanogelsS. R. MAREK<sup>1</sup>, AND N. A. PEPPAS<sup>1</sup><sup>1</sup>The University of Texas at Austin, Austin, TX**\* Drug Delivery Systems Track is sponsored by Acta Biomaterialia**

**Track: Drug Delivery Systems \* – 9-1-14****Targeted Drug Delivery – I**

Chairs: Daniel Kamei, Justin Saul

Room 15

**10:30AM OP-9-1-14A** - Bone Marrow Targeted Multistage Drug Delivery System for the Treatment of Bone Marrow Associated DisordersA. MANN<sup>1</sup>, T. TANAKA<sup>1,2</sup>, R. NIEVES-ALICEA<sup>1</sup>, X. LIU<sup>1,2</sup>, G. LOPEZ-BERESTEIN<sup>3</sup>, A. SOOD<sup>3</sup>, AND M. FERRARI<sup>1,2</sup><sup>1</sup>University of Texas Health Science Center at Houston, Houston, TX, <sup>2</sup>University of Texas at Austin, Austin, TX, <sup>3</sup>University of Texas M.D. Anderson Cancer Center, Houston, TX**10:45AM OP-9-1-14B** - Multi-ligand Nanoparticles for Targeted Drug Delivery to Endothelium after Cardio-InterventionsS. KONA<sup>1,2</sup>, H. XU<sup>1,2</sup>, Y-T. TSAI<sup>1,2</sup>, L-C. SU<sup>1,2</sup>, J-F. DONG<sup>3</sup>, L. TANG<sup>1,2</sup>, AND K. T. NGUYEN<sup>1,2</sup><sup>1</sup>University of Texas at Arlington, Arlington, TX, <sup>2</sup>The University of Texas Southwestern Medical Center, Dallas, TX, <sup>3</sup>Baylor College of Medicine, Houston, TX**11:00AM OP-9-1-14C** - Improving Protein Pharmacokinetics by Engineering Erythrocyte AffinityS. KONTOS<sup>1</sup>, AND J. A. HUBBELL<sup>1</sup><sup>1</sup>Swiss Federal Institute of Technology, Lausanne, VD, Switzerland**11:15AM OP-9-1-14D** - Biomarker-Triggered Aptamer Regulation Strategy for Targeted TherapeuticsN. LI<sup>1</sup>, AND C-M. HO<sup>2</sup><sup>1</sup>University of Miami, Coral Gables, FL, <sup>2</sup>University of California, Los Angeles, Los Angeles, CA**11:30AM OP-9-1-14E** - Neointimal Reduction with Vascular-Matrix Targeted Nanoparticles for Systemic Paclitaxel Delivery.J. M. CHAN<sup>1</sup>, J-W. RHEE<sup>2</sup>, G. GOLOMB<sup>3</sup>, R. LANGER<sup>1</sup>, AND O. FAROKHZAD<sup>2</sup><sup>1</sup>Massachusetts Institute of Technology, Cambridge, MA, <sup>2</sup>Harvard Medical School, Boston, MA, <sup>3</sup>Hebrew University of Jerusalem, Jerusalem, Jerusalem, Israel**11:45AM OP-9-1-14F** Doxorubicin-loaded Nanoscale Liposomes Targeted to E-selectin Ligands on Circulating Tumor CellsV. PONMUDI<sup>1</sup>, AND M. R. KING<sup>1</sup><sup>1</sup>Cornell University, Ithaca, NY

\* Drug Delivery Systems Track is sponsored by Acta Biomaterialia

**Track: Tissue Engineering \* – 9-1-15****Stem Cells and Tissue Engineering – I**

Chairs: Taby Ahsan, Brendan Harley

Ballroom E

**10:30AM OP-9-1-15A** Utilizing a Novel Microfluidic platform as an Ex Vivo Model to Recapitulate the Stem Cell NicheB. CARRION<sup>1</sup>, C. HUANG<sup>2</sup>, AND A. J. PUTNAM<sup>1</sup><sup>1</sup>University of Michigan, Ann Arbor, MI, <sup>2</sup>University of California, Irvine, Irvine, CA**10:45AM OP-9-1-15B** Human Mesenchymal Stem Cell Neural Differentiation by Synergistic Topographical & Sustained Biochemical SignalingX. JIANG<sup>1</sup>, AND S-Y. CHEW<sup>1</sup><sup>1</sup>Nanyang Technological University, Singapore, Singapore, Singapore**11:00AM OP-9-1-15C** Development of a Chondrogenic Pellet Preculture System for Cartilage Tissue Engineering ApplicationsE. J. LEVORSON<sup>1</sup>, F. K. KASPER<sup>1</sup>, AND A. G. MIKOS<sup>1</sup><sup>1</sup>Rice University, Houston, TX**11:15AM OP-9-1-15D** Combinatorial Development of Synthetic Polymeric Substrates for Clonal Growth of Human Pluripotent Stem CellsK. SAHA<sup>1</sup>, Y. MEI<sup>2</sup>, R. LANGER<sup>2</sup>, R. JAENISCH<sup>1</sup>, AND D. ANDERSON<sup>2</sup><sup>1</sup>Whitehead Institute/MIT, Cambridge, MA, <sup>2</sup>MIT, Cambridge, MA**11:30AM OP-9-1-15E** Hematopoietic Stem Cell Culture on an Adipogenic Feeder LayerD. L. GLETTIG<sup>1</sup>, AND D. L. KAPLAN<sup>1</sup><sup>1</sup>Tufts University, Medford, MA**11:45AM OP-9-1-15F** Neural Progenitor Cell Response to Flow-Stimulated Endothelial Cell Extracellular Matrix ProductionC. M. ZWOLINSKI<sup>1</sup>, K. S. ELLISON<sup>1</sup>, N. DEPAOLA<sup>2</sup>, AND D. M. THOMPSON<sup>1</sup><sup>1</sup>Rensselaer Polytechnic Institute, Troy, NY, <sup>2</sup>Illinois Institute of Technology, Chicago, IL

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

**Track: Tissue Engineering \* – 9-1-16****Host Response to Biomaterials**

Chairs: Eric Brey, Kent Leach

Ballroom F

**10:30AM OP-9-1-16A** Modeling the Relative Impact of Fibrous Encapsulation and Tissue Perfusion on Implanted Glucose Sensor PerformanceM. T. NOVAK<sup>1</sup>, F. YUAN<sup>1</sup>, AND W. M. REICHERT<sup>1</sup><sup>1</sup>Duke University, Durham, NC**10:45AM OP-9-1-16B** Novel Near-infrared Fluorescence (NIR) Nanoprobes for In Vivo Imaging of Inflammatory DiseasesJ. ZHOU<sup>1</sup>, Y-T. TSAI<sup>1</sup>, H. WENG<sup>1</sup>, AND L. TANG<sup>1</sup><sup>1</sup>University of Texas at Arlington, Arlington, TX**11:00AM OP-9-1-16C** Dynamic In Vivo Visualization of Anastomosis Between a Prevascularized Implantable Tissue Construct and Host CirculationS. M. WHITE<sup>1</sup>, C. HUGHES<sup>1</sup>, S. GEORGE<sup>1</sup>, AND B. CHOI<sup>1</sup><sup>1</sup>University of California, Irvine, Irvine, CA**11:15AM OP-9-1-16D** Parsing Inflammatory Cues in Angiogenesis Using Bioactive HydrogelsA. L. ZACHMAN<sup>1</sup>, S. W. CROWDER<sup>1</sup>, H. K. KLEINMAN<sup>2</sup>, J. B. KOHN<sup>3</sup>, AND H-J. SUNG<sup>1</sup><sup>1</sup>Vanderbilt University, Nashville, TN, <sup>2</sup>NIH, Bethesda, MD, <sup>3</sup>Rutgers University, Piscataway, NJ**11:30AM OP-9-1-16E** Dendritic Cell Response to a Library of Terpolymers with Graded Variations in Material PropertiesP. KOU<sup>1</sup>, A. JOY<sup>2,3</sup>, B. CUNNINGHAM<sup>2,3</sup>, J. KOHN<sup>2,3</sup>, AND J. BABENSEE<sup>1</sup><sup>1</sup>Georgia Institute of Technology, Atlanta, GA, <sup>2</sup>Rutgers University, Piscataway, NJ, <sup>3</sup>New Jersey Center for Biomaterials, Piscataway, NJ**11:45AM OP-9-1-16F** In Vivo Imaging of Biomaterial-induced Reactive Oxygen SpeciesW. F. LIU<sup>1,2</sup>, M. MA<sup>1</sup>, D. G. ANDERSON<sup>1</sup>, AND R. LANGER<sup>1</sup><sup>1</sup>MIT, Cambridge, MA, <sup>2</sup>UC Irvine, Irvine, CA

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

**Track: Tissue Engineering \* - 9-1-17****Cell- and Gene-Based Therapeutics**

Chairs: Eben Alsberg, WT Godbey

Ballroom G

**10:30AM OP-9-1-17A** Pure, Non-denatured Collagen Matrix: A Cell Delivery Model for Myocardial RepairN. A. KOURIS<sup>1</sup>, J. SQUIRRELL<sup>1</sup>, AND B. OGLE<sup>1,2</sup><sup>1</sup>University of Wisconsin - Madison, Madison, WI, <sup>2</sup>University of Wisconsin-Madison, Madison, WI

**10:45AM OP-9-I-17B** Injectable, Macroporous Hydrogels for Controlled Stem Cell DeploymentN. HUEBSCH<sup>1,2</sup>, C. MADL<sup>1</sup>, M. XU<sup>1</sup>, AND D. J. MOONEY<sup>1,2</sup><sup>1</sup>Harvard University, Cambridge, MA, <sup>2</sup>Wyss Institute for Biologically Inspired Engineering, Boston, MA**11:00AM OP-9-I-17C** Engineering Cell Derived MaterialsJ. C. WOLCHOK<sup>1</sup>, AND P. TRESKO<sup>1</sup><sup>1</sup>University of Utah, Salt Lake City, UT**11:15AM OP-9-I-17D** Microspotting of Adeno-Associated Virus for Combinatorial Genetic TestingK. I. MCCONNELL<sup>1</sup>, R. SCHWELLER<sup>1</sup>, M. DIEHL<sup>1</sup>, AND J. SUH<sup>1</sup><sup>1</sup>Rice University, Houston, TX**11:30AM OP-9-I-17E** Analysis of Promoters and Expression-targeted Gene Therapy, Optimization Based on Cell BehaviorX. ZHANG<sup>1</sup>, AND W. T. GODBEY<sup>1</sup><sup>1</sup>Tulane University, New Orleans, LA**11:45AM OP-9-I-17F** Matrix-mediated Non-viral Gene DeliveryC. CHU<sup>1</sup>, AND H. KONG<sup>1</sup><sup>1</sup>University of Illinois at Urbana-Champaign, Urbana, IL**\*Tissue Engineering Track sponsored by Kinetic Concepts, Inc.****Track: Undergraduate – 9-I-18****Undergraduate Research I****Chairs:** R. Christopher Geiger, Ann Saterbak**Room 13B****10:30AM OP-9-I-18A** A Biomechanical Analysis of Implantation-Induced Cup Deformation in Acetabular Cup DesignsM. E. JONES<sup>1</sup>, S. R. SMALL<sup>2</sup>, J. B. MEDING<sup>2</sup>, AND K. S. TOOHEY<sup>1</sup><sup>1</sup>Rose-Hulman Institute of Technology, Terre Haute, IN, <sup>2</sup>Joint Replacement Surgeons of Indiana Foundation, Mooresville, IN**10:45AM OP-9-I-18B** Biomimetic Thymic Niche: Controlling Notch Signaling in 3D for Generation of T cellsM. P. MENDOZA<sup>1</sup>, M. H. KIM<sup>1</sup>, AND K. ROY<sup>1</sup><sup>1</sup>University of Texas at Austin, Austin, TX**11:00AM OP-9-I-18C** Retaining the Inert Environment of Macroporous Alginate Scaffolds via Sacrificial Porogen ChemistryM. M. XU<sup>1</sup>, N. D. HUEBSCH<sup>1,2</sup>, AND D. J. MOONEY<sup>1,3</sup><sup>1</sup>Harvard University, Cambridge, MA, <sup>2</sup>Harvard-MIT Division of Health Sciences and Technology, Cambridge, MA, <sup>3</sup>Wyss Institute for Biologically Inspired Engineering, Cambridge, MA**11:15AM OP-9-I-18D** Structural Adaptations of Endothelial Progenitor Cells in Response to Fluid Flow Shear StressesE. A. MCNAMARA<sup>1</sup>, M. KNOTHE TATE<sup>1</sup>, AND H. CHANG<sup>1</sup><sup>1</sup>Case Western Reserve University, Cleveland, OH**11:30AM OP-9-I-18E** Engineered Nanoparticles for Targeted Tumor DeliveryS. KADALI<sup>1</sup>, Á. MERCADO<sup>1</sup>, AND E. JABBARI<sup>1</sup><sup>1</sup>University of South Carolina, Columbia, SC**11:45AM OP-9-I-18F** - Compression-induced Changes in Nuclear Rheology: Linking Force Response to Genome OrganizationT. A. ALCOSER<sup>1</sup>, E. A. BOOTH-GAUTHIER<sup>1</sup>, AND K. N. DAHL<sup>1</sup><sup>1</sup>Carnegie Mellon University, Pittsburgh, PA

**Track: Tissue Engineering \* – 9-2-1****Novel Biomaterials and Scaffolds – IV**

**Chairs:** Balaji Sitharaman, Lakeshia Taite  
**Room 12A**

**1:30PM OP-9-2-1A** Engineered Bacterial Cellulose as a Scaffold for Chondrogenesis

B. PANILAITIS<sup>1</sup>, L. SUN<sup>1</sup>, V. YADAV<sup>1</sup>, AND D. KAPLAN<sup>1</sup>  
<sup>1</sup>Tufts University, Medford, MA

**1:45PM OP-9-2-1B** Engineered Aprotinin for Enhanced Stability of Fibrin Biomaterials

K. LORENTZ<sup>1</sup>, P. FREY<sup>1,2</sup>, AND J. A. HUBBELL<sup>1</sup>  
<sup>1</sup>Swiss Federal Institute of Technology (EPFL), Lausanne, VD, Switzerland, <sup>2</sup>Centre Hospitalier Universitaire Vaudois (CHUV), Lausanne, VD, Switzerland

**2:00PM OP-9-2-1C** A Biohybrid Composite of Extracellular Matrix Gel and Elastomeric Fibers for Soft Tissue Repair

Y. HONG<sup>1,2</sup>, A. HUBER<sup>1,2</sup>, R. HASHIZUME<sup>1,2</sup>, N. J. AMOROSO<sup>1</sup>, S. F. BADYLAK<sup>1,2</sup>, AND W. R. WAGNER<sup>1,2</sup>  
<sup>1</sup>McGowan Institute for Regenerative Medicine, University of Pittsburgh, Pittsburgh, PA, <sup>2</sup>Department of Surgery, University of Pittsburgh, Pittsburgh, PA

**2:15PM OP-9-2-1D** Synthetic Collagen Fiber and Elastin-like Protein Composites for Abdominal Wall Repair

J. M. CAVES<sup>1</sup>, W. CUI<sup>1</sup>, J. WEN<sup>1</sup>, V. A. KUMAR<sup>1,2</sup>, A. W. MARTINEZ<sup>1,2</sup>, AND E. L. CHAIKOF<sup>1,2</sup>  
<sup>1</sup>Emory University, Atlanta, GA, <sup>2</sup>Georgia Inst Technology, Atlanta, GA

**2:30PM OP-9-2-1E** Encapsulation and Culture of Neural Stem Cells in Hyaluronic Acid and Collagen-Based Microcapsules

C. B. HIGHLEY<sup>1</sup>, S. H. BAKHRU<sup>1</sup>, AND S. F. ZAPPE<sup>1</sup>  
<sup>1</sup>Carnegie Mellon University, Pittsburgh, PA

**2:45PM OP-9-2-1F** Engineering Differentiated Cells and Stem Cells Using GAG-Chitosan Capsules as Tissue Modules

R. T. ANNAMALAI<sup>1</sup>, D. R. ARMANT<sup>1</sup>, AND H. W. MATTHEW<sup>1</sup>  
<sup>1</sup>Wayne State University, Detroit, MI

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

**Track: Systems Biology, Bioinformatics and Computational Biology – 9-2-2****Signals and Networks in Cancer and Disease – II**

**Chairs:** Mark Brynildsen, Gert Cauwenberghs, David Meaney  
**Room 12B**

**1:30PM OP-9-2-2A** An Integrated Microfluidic-Coupled-Ion Mobility-Mass Spectrometer for Investigating Leukocyte Dynamics

C. MARASCO<sup>1</sup>, J. ENDERS<sup>1</sup>, K. SEALE<sup>1</sup>, J. MCLEAN<sup>1</sup>, AND J. WIKSWO<sup>1</sup>  
<sup>1</sup>Vanderbilt University, Nashville, TN

**1:45PM OP-9-2-2B** Computational Analysis of Extracellular Matrix Degradation in Tumor Microenvironments

M. O. PLATT<sup>1</sup>, Z. T. BARRY<sup>1</sup>, AND C. L. WILDER<sup>1</sup>  
<sup>1</sup>Georgia Institute of Technology, Atlanta, GA

**2:00PM OP-9-2-2C** Modeling the Electrophysiology of the Mammalian Circadian Clock

C. DIEKMAN<sup>1</sup>, AND D. FORGER<sup>1</sup>  
<sup>1</sup>University of Michigan, Ann Arbor, MI

**2:15PM OP-9-2-2D** A Computational Model of Interactions between Human APOBEC3G and HIV Vif

I. HOSSEINI<sup>1</sup>, AND F. MAC GABHANN<sup>1</sup>  
<sup>1</sup>Johns Hopkins University, Baltimore, MD

**2:30PM OP-9-2-2E** Network Analysis-directed Assessment of FDA Approved Drugs for Antileishmanial Activity

A. K. CHAVALI<sup>1</sup>, AND J. A. PAPIN<sup>1</sup>  
<sup>1</sup>University of Virginia, Charlottesville, VA

**2:45PM OP-9-2-2F** Identifying Potential Roles for EGFR Family Cross-Talk During Lesion Formation in Endometriosis

M. T. BESTE<sup>1</sup>, N. DOYLE<sup>1</sup>, A. STARZINSKI-POWITZ<sup>2</sup>, D. A. LAUFFENBURGER<sup>1</sup>, K. B. ISAACSON<sup>3</sup>, AND L. G. GRIFFITH<sup>1</sup>  
<sup>1</sup>Massachusetts Institute of Technology, Cambridge, MA, <sup>2</sup>Goethe Universität, Frankfurt am Main, Germany, <sup>3</sup>Newton-Wellesley Hospital, Newton, MA

**Track: Biomedical Imaging and Optics – 9-2-3**  
**Biophotonics - III**

**Chairs:** Brian Applegate, Tomasz Tckazyk  
**Room 19A**

**1:30PM OP-9-2-3A** Multiphoton Imaging to Aid in Microdissection Testicular Sperm Extraction

D. M. HULAND<sup>1</sup>, R. RAMASAMY<sup>2</sup>, T. SOUTHARD<sup>1</sup>, S. MUKHERJEE<sup>2</sup>, W. W. WEBB<sup>1</sup>, AND C. XU<sup>1</sup>  
<sup>1</sup>Cornell University, Ithaca, NY, <sup>2</sup>Weill Cornell Medical College, New York, NY

**1:45PM OP-9-2-3B** Molecular Imaging with Pump-Probe Optical Coherence Microscopy

Q. WAN<sup>1</sup>, AND B. APPLGATE<sup>1</sup>  
<sup>1</sup>TAMU, College Station, TX

**2:00PM OP-9-2-3C** MEMS Based Hyperspectral Imaging System Towards Imaging of Biological Tissue

S. BISH<sup>1</sup>, Y. WANG<sup>1</sup>, J. W. TUNNELL<sup>1</sup>, AND J. X. ZHANG<sup>1</sup>  
<sup>1</sup>University of Texas at Austin, Austin, TX

**2:15PM OP-9-2-3D** Ultrashort Pulse Nonlinear Optical Microscopy Spectral Imaging System

A. LEE<sup>1</sup>, S. VITHA<sup>1</sup>, A. HOLZENBURG<sup>1</sup>, AND A. YEHI<sup>1</sup>  
<sup>1</sup>Texas A&M University, College Station, TX

**2:30PM OP-9-2-3E** Using a Photonic Crystal Fiber Supercontinuum Source for Multispectral Photoacoustic Microscopy

Y. N. BILLEH<sup>1</sup>, M. LIU<sup>2</sup>, AND T. BUMA<sup>2</sup>  
<sup>1</sup>University of Michigan, Ann Arbor, MI, <sup>2</sup>University of Delaware, Newark, DE

**2:45PM OP-9-2-3F** Simultaneous Co-registered Morphological and Biochemical Imaging of Coronary Atherosclerotic Plaques Using a Dual-modal Optical System Combining OCT and FLIM

J. PARK<sup>1</sup>, B. E. APPLGATE<sup>1</sup>, S. SHRESTA<sup>1</sup>, P. PANDE<sup>1</sup>, AND J. A. JO<sup>1</sup>  
<sup>1</sup>Texas A&M University, College Station, TX

**Track: Neural Engineering – 9-2-4****Neural Engineering Technology**

**Chairs:** Pat Crago, Justin Williams  
**Room 19B**

**1:30PM OP-9-2-4A** STEP-Aligned Polymer Fiber Meshes Direct Migration and Neuronal Differentiation of Neural Stem Cells

S. BAKHRU<sup>1</sup>, AND A. S. NAIN<sup>2</sup>  
<sup>1</sup>Carnegie Mellon University, Pittsburgh, PA, <sup>2</sup>Virginia Tech, Blacksburg, VA

**1:45PM OP-9-2-4B** Perfusion System for Enhanced Viability and Local Chemical Stimulation of Organotypic Brain SlicesH. H. CAICEDO<sup>1</sup>, M. VIGNES<sup>2,3</sup>, B. BRUGG<sup>2</sup>, AND J. M. PEYRIN<sup>2</sup><sup>1</sup>University of Illinois at Chicago, Chicago, IL, <sup>2</sup>Université Pierre et Marie Curie, Paris, France, <sup>3</sup>Institut Curie, Paris, France**2:00PM OP-9-2-4C** Dissecting *C. elegans* Neural Circuitry and Behavior in Microfluidic ArenasD. R. ALBRECHT<sup>1</sup>, AND C. BARGMANN<sup>1</sup><sup>1</sup>The Rockefeller University, New York, NY**2:15PM OP-9-2-4D** PEDOT Improves Sensitivity and Fidelity of *In Situ* Nerve Conduction SignalsC. M. FROST<sup>1</sup>, K. EWING<sup>1</sup>, B. WEI<sup>1</sup>, Z. BAGHMANLI<sup>1</sup>, P. CEDERNA<sup>1</sup>, AND M. URBANCHEK<sup>1</sup><sup>1</sup>University of Michigan, Ann Arbor, MI**2:30PM OP-9-2-4E** Novel Packaging and Interconnect Techniques for Implantable MEMS Devices for the BrainJ. SUTANTO<sup>1</sup>, S. ANAND<sup>1</sup>, A. SRIDHARAN<sup>1</sup>, AND J. MUTHUSWAMY<sup>1</sup><sup>1</sup>Arizona State University, Tempe, AZ**2:45PM OP-9-2-4F** An Optoelectronic Hybrid Device for *In Vivo* Stimulation and Recording of Neural MicrocircuitsJ. WANG<sup>1</sup>, AND D. BORTON<sup>1</sup><sup>1</sup>Brown University, Providence, RI**Track: Biomedical Engineering Education – 9-2-5****Teaching Tools and Strategies****Chairs:** Aura Gimm, Joe Tranquillo

Room 18A

**1:30PM OP-9-2-5A** A Project-Oriented BME Survey Course: Making Pass-Fail Grading WorkJ. A. SMITH<sup>1</sup><sup>1</sup>Ryerson University, Toronto, ON, Canada**1:45PM OP-9-2-5B** Program Improvement through Assessment and EvaluationL. HERZ<sup>1</sup><sup>1</sup>Lehigh University, Bethlehem, PA**2:00PM OP-9-2-5C** Developing a Novel Approach to Training Biomedical Innovation Leaders: The New Johns Hopkins Center for Bioengineering Innovation & Design: Outcomes from Year OneY. YAZDI<sup>1</sup>, S. ACHARYA<sup>1</sup>, A. POLSANI<sup>1</sup>, A. J. KHANNA<sup>1</sup>, R. H. ALLEN<sup>1</sup>, M. B. SACHS<sup>1</sup><sup>1</sup>Johns Hopkins University, Baltimore, MD**2:15PM OP-9-2-5D** Digital Ink in the BME Classroom: Application in Quantitative PhysiologyS. A. CAREY<sup>1</sup>, S. DANIEL<sup>1</sup>, AND C. A. REINHART-KING<sup>1</sup><sup>1</sup>Cornell University, Ithaca, NY**2:30PM OP-9-2-5E** Implementation of Problem-Based Learning in Two Sophomore Bioengineering CoursesA. SATERBAK<sup>1</sup>, J. JACOT<sup>1</sup>, AND T. VOLZ<sup>1</sup><sup>1</sup>Rice University, Houston, TX**2:45PM OP-9-2-5F** Acquiring Experimental Design Skills Through Problem-Based LearningS. M. GEORGE<sup>1</sup>, AND B. B. FASSE<sup>1</sup><sup>1</sup>Georgia Institute of Technology, Atlanta, GA**Track: Cellular and Molecular Engineering – 9-2-6****Mechanotransduction – II****Chairs:** Adam Engler, Alisha Sieminski

Room 18B

**1:30PM OP-9-2-6A** Coupled Biomechanical Signal Integration Reveals Nonlinear Cell Responses through Cell AlignmentR. STEWARD JR.<sup>1</sup>, C-M. CHENG<sup>2</sup>, AND P. LEDUC<sup>1</sup><sup>1</sup>Carnegie Mellon University, Pittsburgh, PA, <sup>2</sup>Harvard University, Cambridge, MA**1:45PM OP-9-2-6B** Nanoscale Mechanical Manipulation of the Endothelial Cell Surface Reveals Mechanical Coupling of Membrane RaftsD. FUENTES<sup>1</sup>, C. BAE<sup>2</sup>, AND P. J. BUTLER<sup>1</sup><sup>1</sup>Penn State University, University Park, PA, <sup>2</sup>State University of New York at Buffalo, Buffalo, NY**2:00PM OP-9-2-6C** Suggested Structure of Activated VinculinJ. GOLJI<sup>1</sup>, AND M. MOFRAD<sup>1</sup><sup>1</sup>UC Berkeley, Berkeley, CA**2:15PM OP-9-2-6D** The Primary Cilium: A Potential Receptor Antenna in Human Adipose Stem Cells?J. C. BODLE<sup>1</sup>, A. R. SAKHARE<sup>1</sup>, S. H. BERNACKI<sup>1</sup>, J. QI<sup>2</sup>, A. J. BANES<sup>3</sup>, AND E. G. LOBOA<sup>1</sup><sup>1</sup>North Carolina State University, Raleigh, NC, <sup>2</sup>Flexcell International Inc., Hillsborough, NC, <sup>3</sup>University of North Carolina, Hillsborough, NC**2:30PM OP-9-2-6E** Mechanochemical Regulation of Actin Depolymerization KineticsC-Y. LEE<sup>1,2</sup>, J. LOU<sup>1,3</sup>, K-K. WEN<sup>4</sup>, S. ONO<sup>2</sup>, S. G. ESKIN<sup>1,2</sup>, P. A. RUBENSTEIN<sup>4</sup>, C. ZHU<sup>1,2</sup>, AND L. V. MCINTIRE<sup>1,2</sup><sup>1</sup>Georgia Institute of Technology, Atlanta, GA, <sup>2</sup>Emory University, Atlanta, GA, <sup>3</sup>Chinese Academy of Sciences, Beijing, China, People's Republic of, <sup>4</sup>University of Iowa, Iowa City, IA**2:45PM OP-9-2-6F** Stem Cell Durotaxin - Trafficking to Fibrotic ScarsM. RAAB<sup>1</sup>, AND D. DISCHER<sup>1</sup><sup>1</sup>University of Pennsylvania, Philadelphia, PA**Track: Cardiovascular Engineering - 9-2-7****Cardiac Stents and Arterial Devices****Chairs:** Jun Liao, James Moore, Jr.

Room 18C

**1:30PM OP-9-2-7A** Incorrect Stent Sizing Promotes In-stent Restenosis: Role of Endothelial Shear Stress and Intramural Wall StressH. Y. CHEN<sup>1</sup>, D. BHATT<sup>2</sup>, AND G. KASSAB<sup>3</sup><sup>1</sup>Purdue University, Indianapolis, IN, <sup>2</sup>Harvard Medical School, Boston, MA, <sup>3</sup>Indiana University School of Medicine, Indianapolis, IN**1:45PM OP-9-2-7B** Modelling and Experiments to Aid Performance Assessment of Biodegradable Metallic StentsJ. GROGAN<sup>1</sup>, S. LEEN<sup>1</sup>, AND P. MCHUGH<sup>1</sup><sup>1</sup>NUI Galway, Galway, Galway, Ireland**2:00PM OP-9-2-7C** *In Vitro* and *In Vivo* Characterization of Biodegradable Polymer-based Drug Eluting StentS. K. YAZDANI<sup>1</sup>, M. VORPAHL<sup>1</sup>, S-H. SU<sup>2</sup>, J. SHULZE<sup>2</sup>, F. D. KOLODIE<sup>1</sup>, AND R. VIRMANI<sup>1</sup><sup>1</sup>CVPath Institute, Gaithersburg, MD, <sup>2</sup>Biosensors International, Singapore, Singapore, Singapore**2:15PM OP-9-2-7D** Exploiting the Differential Cellular Effects of Elastin as a Device CoatingB. D. WILSON<sup>1</sup>, L. K. SORENSEN<sup>1</sup>, C. C. GIBSON<sup>1</sup>, M. YOKLAVICH<sup>2</sup>, L. L. KELLEY<sup>1</sup>, Y-T. SHIU<sup>1</sup>, AND D. Y. LI<sup>1</sup><sup>1</sup>University of Utah, Salt Lake City, UT, <sup>2</sup>OrbusNeich Medical, Fort Lauderdale, FL

**2:30PM OP-9-2-7E** A 360-deg Digital Image Correlation Optical System for Arterial Strain Measurement *In Vitro*Y-U. LEE<sup>1</sup>, K. GENOVESE<sup>2</sup>, AND J. D. HUMPHREY<sup>1</sup><sup>1</sup>Texas A&M University, College Station, TX, <sup>2</sup>Università degli Studi della Basilicata, POTENZA, POTENZA, Italy**2:45PM OP-9-2-7F** Physiology-based Control System for a Novel Pediatric Adjustable Systemic-Pulmonary Artery ShuntA. R. CONNOR<sup>1</sup>, W. I. DOUGLAS<sup>2</sup>, AND M. W. MOHIUDDIN<sup>1</sup><sup>1</sup>Michael E. DeBakey Institute, TX A&M University, College Station, TX, <sup>2</sup>The University of Texas Health Science Center, Houston, TX**Track: Cardiovascular Engineering – 9-2-8****Vascular Mechanosignal Transduction****Chairs:** Anthony Passerini, Cynthia Reinhart-King,  
Room 18D**1:30PM OP-9-2-8A** Nesprin-3 Regulates Human Aortic Endothelial Cell MorphologyJ. T. MORGAN<sup>1</sup>, G. PENG<sup>1</sup>, E. R. PFEIFFER<sup>1</sup>, T. L. THIRKILL<sup>1</sup>, G. C. DOUGLAS<sup>1</sup>, D. A. STARR<sup>1</sup>, AND A. I. BARAKAT<sup>1</sup><sup>1</sup>University of California, Davis, Davis, CA**1:45PM OP-9-2-8B** HSPG-Mediated FAK Activation Plays a Mechanotransduction Role in Interstitial Flow-Induced MMP ExpressionZ-D. SHI<sup>1</sup>, AND J. M. TARBELL<sup>1</sup><sup>1</sup>City College and Graduate Center of City University of New York, New York, NY**2:00PM OP-9-2-8C** Shear Stress Modulates Metallothionein Expression and Intracellular Zinc Level in Endothelial CellsS. LEE<sup>1</sup>, D. E. CONWAY<sup>2</sup>, S. G. ESKIN<sup>1</sup>, A. K. SHAH<sup>1</sup>, AND L. V. MCINTIRE<sup>1</sup><sup>1</sup>Georgia Institute of Technology, Atlanta, GA, <sup>2</sup>University of Virginia, Charlottesville, VA**2:15PM OP-9-2-8D** Shear Stress Suppresses TNF Induced Apoptosis; In Part by Modulating DAPK Expression and ActivityK. RENNIE<sup>1</sup>, AND J. Y. JI<sup>1</sup><sup>1</sup>Indiana University Purdue University Indianapolis, Indianapolis, IN**2:30PM OP-9-2-8E** MicroRNA-10a Regulation of Pro-inflammatory Phenotype in Athero-susceptible Endothelium *In Vivo* and *In Vitro*Y. FANG<sup>1</sup>, C. SHI<sup>1</sup>, E. MANDUCHI<sup>1</sup>, M. CIVELEK<sup>1</sup>, AND P. F. DAVIES<sup>1</sup><sup>1</sup>University of Pennsylvania, Philadelphia, PA**2:45PM OP-9-2-8F** Atherosclerosis and Flow – The End Game?C. F. DEWEY JR<sup>1</sup><sup>1</sup>MIT, Cambridge, MA**Track: Respiratory Engineering - 9-2-9****Mechanobiology in the Lung****Chairs:** Steve George, Cheryl Miller  
Room 17A**1:30PM OP-9-2-9A** Alveolar Epithelial Cells Respond to Mechanical Stretch Through Primary Cilia FormationR. L. HEISE<sup>1</sup>, AND S. GARANTZIOS<sup>1</sup><sup>1</sup>National Institute of Environmental Health Sciences, Research Triangle Park, NC**1:45PM OP-9-2-9B** Role of Microtubule Dynamics in the Response of Airway Smooth Muscle Cells to Cyclic Uniaxial StretchingH. PARAMESWARAN<sup>1</sup>, M. MORIOKA<sup>2</sup>, S. ITO<sup>2</sup>, AND B. SUKI<sup>1</sup><sup>1</sup>Boston University, Boston, MA, <sup>2</sup>Nagoya University, Nagoya, Aichi Prefecture, Japan**2:00PM OP-9-2-9C** Mechanical Properties of Migrating Alveolar Epithelial CellsA. BADA<sup>1</sup>, C. E. COZAD<sup>1</sup>, L. M. CROSBY<sup>2</sup>, E. ROAN<sup>1</sup>, AND C. M. WATERS<sup>2</sup><sup>1</sup>University of Memphis, Memphis, TN, <sup>2</sup>University of Tennessee Health Science Center, Memphis, TN**2:15PM OP-9-2-9D** *In Vivo* Optical Coherence Elastography of the TracheaC. J. ROBERTSON<sup>1</sup>, Y-C. AHN<sup>1</sup>, S-W. LEE<sup>1</sup>, S. MAHON<sup>1</sup>, Z. CHEN<sup>1</sup>, M. BRENNER<sup>1</sup>, AND S. C. GEORGE<sup>1</sup><sup>1</sup>UCI, Irvine, CA**2:30PM OP-9-2-9E** PTEN and Akt Mediated Biomechanical Mechanisms of Lung Epithelial Cell Migration and Wound RepairC. COSMIN<sup>1</sup>, S. BAO<sup>2</sup>, D. KNOELL<sup>2</sup>, AND S. GHADIALI<sup>2</sup><sup>1</sup>The Ohio State University, Columbus, OH, <sup>2</sup>Ohio State University, Columbus, OH**2:45PM OP-9-2-9F** PECAM-1 Mechanosensing Contributes to ROS Generation with Loss of Shear in the *Ex Vivo* Mouse LungJ. NOEL<sup>1</sup>, N. HONG<sup>1</sup>, K. DEBOLT<sup>1</sup>, A. FISHER<sup>1</sup>, AND S. CHATTERJEE<sup>1</sup><sup>1</sup>University of Pennsylvania, Philadelphia, PA**Track: Orthopedic and Rehabilitation****Engineering – 9-2-10****Orthopedic Hard Tissue Biomechanics****Chairs:** Warren Grayson, Jiro Nagatomi  
Room 17B**1:30PM OP-9-2-10A** Architectural Predictors for Human Trabecular Bone StrengthT. GUDA<sup>1,2</sup>, B. E. POLLOT<sup>2</sup>, AND J. ONG<sup>2</sup><sup>1</sup>Wake Forest Institute for Regenerative Medicine, Winston-Salem, NC, <sup>2</sup>University of Texas at San Antonio, San Antonio, TX**1:45PM OP-9-2-10B** From CT Scans to Bone Resorption Pattern – A Patient Specific Bone Remodeling Simulation for THRX. LIU<sup>1</sup>, S. GOVINDARAJAN<sup>1</sup>, S. SETT<sup>1</sup>, B. VEECKMANS<sup>2</sup>, P. LOPES<sup>2</sup>, AND E. BOELEN<sup>2</sup><sup>1</sup>Dassault Systemes Simulia Corp, Providence, RI, <sup>2</sup>Materialise, Leuven, Flemish Brabant, Belgium**2:00PM OP-9-2-10C** Acetabular Cup Design and Orientation Affect Periacetabular Loading DistributionM. E. BEREND<sup>1</sup>, S. R. SMALL<sup>1</sup>, L. HOWARD<sup>2</sup>, D. TUNC<sup>2</sup>, C. A. BUCKLEY<sup>2</sup>, AND M. A. RITTER<sup>1</sup><sup>1</sup>JRSI Foundation, Inc., Mooresville, IN, <sup>2</sup>Rose-Hulman Institute of Technology, Terre Haute, IN**2:15PM OP-9-2-10D** Four Point Bending Stiffness of Fractured Rat Femora Treated with Two Different Methods of FixationH. KIM<sup>1</sup>, C. GRIFFITH<sup>2</sup>, S. LEUNG<sup>2</sup>, L. GITAJN<sup>3</sup>, L. MURPHY<sup>3</sup>, A. H. HSIEH<sup>1,2</sup>, R. V. O'TOOLE<sup>2</sup>, AND V. D. PELLEGRINI<sup>2</sup><sup>1</sup>University of Maryland, College Park, MD, <sup>2</sup>University of Maryland, Medical Center, Baltimore, MD, <sup>3</sup>University of Maryland, Baltimore, MD**2:30PM OP-9-2-10E** Deletion of Osteocalcin and Osteopontin from Extracellular Matrix Leads to Increased Bone FragilityA. A. POUNDARIK<sup>1</sup>, C. GUNDBERG<sup>2</sup>, AND D. VASHISHTH<sup>1</sup><sup>1</sup>Rensselaer Polytechnic Institute, Troy, NY, <sup>2</sup>Yale University, New Haven, CT**2:45PM OP-9-2-10F** Measurement of Osteopontin and Osteocalcin from Laser Microdissected Microdamaged Regions in BoneL. KARIM<sup>1</sup>, G. SROGA<sup>1</sup>, AND D. VASHISHTH<sup>1</sup><sup>1</sup>Rensselaer Polytechnic Institute, Troy, NY

**Track: Devices: Nano to Micro – 9-2-11****Biosensors, Bio-Interfaces and Implantable Devices – I**

**Chairs:** Peter Gascoyne, Chenzhong Li  
**Room 16A**

**1:30PM OP-9-2-11A** Long-Term Evaluation of the Implantable Magnetic Microactuators

H. LEE<sup>1</sup>, A. K. GILL<sup>1</sup>, M. BERGSNEIDER<sup>1</sup>, AND J. W. JUDY<sup>1</sup>  
<sup>1</sup>UCLA, Los Angeles, CA

**1:45PM OP-9-2-11B** Electronic Nanobiosensors for Genomic and Proteomic Biomarkers Analysis at Single Cell Level

S. PRABHULKAR<sup>1</sup>, AND C-Z. LI<sup>1</sup>  
<sup>1</sup>Florida International University, Miami, FL

**2:00PM OP-9-2-11C** An Implantable Biochip to Influence Patient Outcomes Following Trauma-induced Hemorrhage

A. GUISEPPI-ELIE<sup>1</sup>  
<sup>1</sup>Clemson University, Clemson, SC

**2:15PM OP-9-2-11D** NanoCluster Beacon (NCB): a DNA-silver Nanocluster Probe that Fluoresces Upon Hybridization

H-C. YEH<sup>1</sup>, J. SHARMA<sup>1</sup>, J. J. HAN<sup>1</sup>, J. S. MARTINEZ<sup>1</sup>, AND J. H. WERNER<sup>1</sup>  
<sup>1</sup>Los Alamos National Laboratory, Los Alamos, NM

**2:30PM OP-9-2-11E** Nanoscale Growth of Individual Bacteria with Hydrodynamic Sensing

P. KINNUNEN<sup>1</sup>, I. SINN<sup>1</sup>, D. NEWTON<sup>1</sup>, M. BURNS<sup>1</sup>, B. H. MCNAUGHTON<sup>1</sup>, AND R. KOPELMAN<sup>1</sup>  
<sup>1</sup>University of Michigan, Ann Arbor, MI

**2:45PM OP-9-2-11F** On-chip Labeling via Enzymatic DNA Polymerization for Nucleic Acid Detection

V. TJONG<sup>1</sup>, H. YU<sup>1</sup>, A. HUCKNALL<sup>1</sup>, S. RANGARAJAN<sup>1</sup>, AND A. CHILKOTI<sup>1</sup>  
<sup>1</sup>Duke University, Durham, NC

**Track: Devices: Nano to Micro – 9-2-12****Emerging Concept of Medical Micro Devices**

**Chairs:** Mark Feldman, Keith Johnson  
**Room 16B**

**1:30PM OP-9-2-12A** Nanoporous Silica as Membrane for Implantable Ultra-thin Biofuel Cells (iBFCs)

T. SHARMA<sup>1</sup>, Y. HU<sup>1</sup>, M. STOLLER<sup>1</sup>, R. S. RUOFF<sup>1</sup>, M. FELDMAN<sup>2</sup>, M. FERRARI<sup>3</sup>, AND X. ZHANG<sup>1</sup>  
<sup>1</sup>Univ of Texas at Austin, Austin, TX, <sup>2</sup>Univ of Texas Health Science Center at San Antonio, San Antonio, TX, <sup>3</sup>Univ of Texas Health Science Center at Houston, Houston, TX

**1:45PM OP-9-2-12B** Immunoaffinity Microchip for Hematopoietic Stem Cell Enrichment From Human Blood

J. ZHANG<sup>1</sup>, H. GASKINS<sup>1</sup>, AND P. J. KENIS<sup>1</sup>  
<sup>1</sup>University of Illinois at Urbana Champaign, Urbana, IL

**2:00PM OP-9-2-12C** Monodisperse Artificial Oxygen Carriers Generated on a Droplet Microfluidics Platform

S-Y. TEH<sup>1</sup>, AND A. P. LEE<sup>1</sup>  
<sup>1</sup>University of California, Irvine, Irvine, CA

**2:15PM OP-9-2-12D** Controlled Perturbation of Cells Using Magnetic Nanorods

A. CELEDON<sup>1</sup>, AND D. WIRTZ<sup>2</sup>  
<sup>1</sup>Catholic University/Johns Hopkins, Santiago, Metropolitana, Chile, <sup>2</sup>Johns Hopkins University, Baltimore, MD

**2:30PM OP-9-2-12E** Thermoresponsive Nanocomposite Hydrogels as Self-Cleaning Membranes for Glucose Biosensors

M. A. GRUNLAN<sup>1</sup>, R. FEI<sup>1</sup>, G. COTE<sup>1</sup>, AND A. A. ABRAHAM<sup>1</sup>  
<sup>1</sup>Texas A&M University, College Station, TX

**2:45PM OP-9-2-12F** Electrospun Polymer Fibers With Zinc Oxide Nanoparticles Provide Efficient Antibacterial Surfaces

J. T. SEIL<sup>1</sup>, AND T. J. WEBSTER<sup>1</sup>  
<sup>1</sup>Brown University, Providence, RI

**Track: Drug Delivery Systems \* – 9-2-13****Targeted Drug Delivery – II**

**Chairs:** Daniel Kamei, Justin Saul  
**Room 14**

**1:30PM OP-9-2-13A** TLR9-targeted Biodegradable Nanoparticles as Immunization Vectors Protect Against West Nile Encephalitis

S. L. DEMENTO<sup>1</sup>, N. BONAFE<sup>2</sup>, W. CUI<sup>1</sup>, S. M. KAECH<sup>1</sup>, M. J. CAPLAN<sup>1</sup>, E. FIKRIG<sup>1</sup>, M. LEDIZET<sup>2</sup>, AND T. M. FAHMY<sup>1</sup>  
<sup>1</sup>Yale University, New Haven, CT, <sup>2</sup>L<sup>2</sup> Diagnostics, New Haven, CT

**1:45PM OP-9-2-13B** Lupus Immunotherapy Using a CD4 Targeted, Hydrogel-Based Nanoparticle System

M. LOOK<sup>1</sup>, E. STERN<sup>1</sup>, Q. WANG<sup>1</sup>, L. DIPLACIDO<sup>1</sup>, J. E. CRAFT<sup>1</sup>, AND T. M. FAHMY<sup>1</sup>  
<sup>1</sup>Yale University, New Haven, CT

**2:00PM OP-9-2-13C** Comprehensive Immunomodulatory Treatment via Targeted Drug Delivery to ICAM-1

S. KANG<sup>1</sup>, AND M. M. JIN<sup>1</sup>  
<sup>1</sup>Cornell University, Ithaca, NY

**2:15PM OP-9-2-13D** Transcellular Transport of Nanocarriers Across Gastrointestinal Epithelial Cells by Targeting ICAM-1

R. GHAFARIAN<sup>1</sup>, T. BHOWMICK<sup>1</sup>, AND S. MURO<sup>1</sup>  
<sup>1</sup>University of Maryland, College Park, MD

**2:30PM OP-9-2-13E** Development of Novel Single Chain Antibodies for Fibrin-targeted Theranostics

S. E. STABENFELDT<sup>1</sup>, W. E. BROWN<sup>1</sup>, L. CAO<sup>1</sup>, AND T. H. BARKER<sup>1</sup>  
<sup>1</sup>Georgia Institute of Technology / Emory University, Atlanta, GA

**2:45PM OP-9-2-13F** T Cell Vehicles Enhance Tumor Accumulation of Gold Nanoparticles

L. CARPIN<sup>1,2</sup>, A. BEAR<sup>2,3</sup>, J. YOUNG<sup>1</sup>, N. LEWINSKI<sup>1</sup>, A. FOSTER<sup>2,3</sup>, AND R. DREZEK<sup>1</sup>  
<sup>1</sup>Rice University, Houston, TX, <sup>2</sup>Baylor College of Medicine, Houston, TX, <sup>3</sup>Texas Children's Hospital, Houston, TX

\* Drug Delivery Systems Track is sponsored by Acta Biomaterialia

**Track: New Frontiers in Bioengineering – 9-2-14****Integrated Cellular Systems**

**Chairs:** K. Jimmy Hsia, Robert Nerem  
**Room 15**

**1:30PM OP-9-2-14A** Integrated Cellular Systems: An Engineering Approach to Constructing Multi-cellular Organisms

R. D. KAMM<sup>1</sup>  
<sup>1</sup>Massachusetts Institute of Technology, Cambridge, MA

**1:45PM OP-9-2-14B** Engineering the Differentiation of Multicellular Stem Cell Systems

T. C. MCDEVITT<sup>1</sup>  
<sup>1</sup>Georgia Institute of Technology, Atlanta, GA

**2:00PM OP-9-2-14C** Electrophysiological Sorting of Pluripotent Stem Cell-Derived Cardiomyocytes in a Microfluidic PlatformF. B. MYERS<sup>1</sup>, O. J. ABILEZ<sup>2</sup>, C. K. ZARINS<sup>2</sup>, AND L. P. LEE<sup>1</sup><sup>1</sup>University of California, Berkeley, Berkeley, CA, <sup>2</sup>Stanford University, Stanford, CA**2:15PM OP-9-2-14D** Enabling Technologies for Development and Characterization of Integrated Cellular SystemsR. BASHIR<sup>1</sup><sup>1</sup>UIUC, Urbana, IL**2:30PM OP-9-2-14E** Mechanical Regulation of Tissue MorphogenesisN. GJOREVSKI<sup>1</sup>, AND C. M. NELSON<sup>1</sup><sup>1</sup>Princeton University, Princeton, NJ**2:45PM OP-9-2-14F** Synthetic Biology: From Modules to SystemsR. WEISS<sup>1</sup><sup>1</sup>MIT, Cambridge, MA**Track: Tissue Engineering \* – 9-2-15****Stem Cells and Tissue Engineering – II****Chairs:** Eben Alsberg, Shyni Varghese**Ballroom E****1:30PM OP-9-2-15A** Bioreactor Type and Culture Parameters Significantly Influence ES Cell DifferentiationK. M. FRIDLEY<sup>1</sup>, I. FERNANDEZ<sup>1</sup>, R. AMBLER<sup>1</sup>, AND K. ROY<sup>1</sup><sup>1</sup>The University of Texas at Austin, Austin, TX**1:45PM OP-9-2-15B** Role of Substrate Stiffness on ESC Differentiation into Endoderm LineageM. JARAMILLO<sup>1</sup>, S. SINGH<sup>1</sup>, J. CANDIELLO<sup>1</sup>, P. KUMTA<sup>1</sup>, AND I. BANERJEE<sup>1</sup><sup>1</sup>University of Pittsburgh, Pittsburgh, PA**2:00PM OP-9-2-15C** Endoderm Expression in Embryonic Stem Cells is Driven by Scaffold StructureW. HELEN<sup>1</sup>, C. C. KING<sup>1</sup>, AND A. J. ENGLER<sup>1</sup><sup>1</sup>UC San Diego, San Diego, CA**2:15PM OP-9-2-15D** Quantification and Enhancement of Contractile Characteristics in hESC and iPSC Derived CardiomyocytesS. D. LUNDY<sup>1</sup>, M. J. BLOEMINK<sup>2</sup>, M. A. GEEVES<sup>2</sup>, M. A. LAFLAMME<sup>1</sup>, AND M. REGNIER<sup>1</sup><sup>1</sup>University of Washington, Seattle, WA, <sup>2</sup>University of Kent, Canterbury, Kent, United Kingdom**2:30PM OP-9-2-15E** Peripheral Nerve Regeneration by Using Induced Pluripotent Stem Cell-Derived Neural Crest Stem CellsA. WANG<sup>1</sup>, Z. TANG<sup>1</sup>, I-H. PARK<sup>2</sup>, Y. ZHU<sup>1</sup>, S. PATEL<sup>1</sup>, G. Q. DALEY<sup>3</sup>, AND S. LI<sup>1</sup><sup>1</sup>UC Berkeley, Berkeley, CA, <sup>2</sup>Yale School of Medicine, New Haven, CT, <sup>3</sup>Harvard Medical School, Boston, MA**2:45PM OP-9-2-15F** Generation of Hematopoietic progenitors from Induced Pluripotent Stem Cells under Feeder Free SystemI. FERNANDEZ<sup>1</sup>, J. LIN<sup>2</sup>, AND K. ROY<sup>2</sup><sup>1</sup>University of Texas at Austin, Austin, TX, <sup>2</sup>University of Texas at Austin, Austin, TX**\*Tissue Engineering Track sponsored by Kinetic Concepts, Inc.****Track: Tissue Engineering \* – 9-2-16****Cardiovascular Tissue Engineering – III****Chairs:** Guohao Dai, Mariah Hahn**Ballroom F****1:30PM OP-9-2-16A** Understanding Mechanisms by Which Injectable Materials Preserve Cardiac Function Post-MIA. RANE<sup>1</sup>, J. S. CHUANG<sup>1</sup>, A. SHAH<sup>1</sup>, D. P. HU<sup>1</sup>, N. D. DALTON<sup>1</sup>, Y. GU<sup>1</sup>, K. L. PETERSON<sup>1</sup>, J. H. OMENS<sup>1</sup>, AND K. L. CHRISTMAN<sup>1</sup><sup>1</sup>University of California San Diego, La Jolla, CA**1:45PM OP-9-2-16B** Cell-Seeded Fibrin Scaffolds for Cardiac Tissue EngineeringK. S. THOMSON<sup>1</sup>, G. D. ROBINSON<sup>1</sup>, F. S. KORTE<sup>1</sup>, C. M. GIACHELLI<sup>1</sup>, B. D. RATNER<sup>1</sup>, M. SCATENA<sup>1</sup>, AND M. REGNIER<sup>1</sup><sup>1</sup>University of Washington, Seattle, WA**2:00PM OP-9-2-16C** Evaluating the Mechanical Contribution of De-novo Matrix in Engineered Heart Valve ScaffoldsJ. A. STELLA<sup>1</sup>, N. J. AMOROSO<sup>1</sup>, J. E. MAYER<sup>2</sup>, W. R. WAGNER<sup>1</sup>, AND M. S. SACKS<sup>1</sup><sup>1</sup>University of Pittsburgh, Pittsburgh, PA, <sup>2</sup>Children's Hospital Boston, Boston, MA**2:15PM OP-9-2-16D** In Situ Regeneration of the Heart ValveD. RAGHAVAN<sup>1</sup>, J. K. WILLIAMS<sup>1</sup>, J. YOO<sup>1</sup>, S. J. LEE<sup>1</sup>, J. E. JORDAN<sup>1</sup>, AND A. ATALA<sup>1</sup><sup>1</sup>Wake Forest University, Winston-Salem, NC**2:30PM OP-9-2-16E** Characterization of Sex-related Differences in the Phenotype of Valvular Interstitial CellsC. M. MCCOY<sup>1</sup>, AND K. S. MASTERS<sup>1</sup><sup>1</sup>University of Wisconsin-Madison, Madison, WI**2:45PM OP-9-2-16F** Comparison of Fibrin-based Engineered Tissue from Neonatal Versus Adult Human Dermal FibroblastZ. SYEDAIN<sup>1</sup>, AND R. TRANQUILLO<sup>1</sup><sup>1</sup>University of Minnesota, Minneapolis, MN**\*Tissue Engineering Track sponsored by Kinetic Concepts, Inc.****Track: Tissue Engineering \* – 9-2-17****Bioreactors and Bioprocessing in Tissue Engineering****Chairs:** Milica Radisic, Vassilios Sikavitsas**Ballroom G****1:30PM OP-9-2-17A** Effect of Strain on the Tensile Properties and mRNA Expression of a Tissue-Engineered Flexor TendonT. L. SMITH<sup>1</sup>, P. W. WHITLOCK<sup>1</sup>, T. M. SEYLER<sup>1</sup>, C. N. NORTHAM<sup>1</sup>, M. E. VAN DYKE<sup>1</sup>, G. G. POEHLING<sup>1</sup>, AND L. A. KOMAN<sup>1</sup><sup>1</sup>Wake Forest University Health Sciences, Winston-Salem, NC**1:45PM OP-9-2-17B** hMSC Culture in a Tubular Perfusion System Enhances Late Osteoblastic DifferentiationA. B. YEATTS<sup>1</sup>, AND J. P. FISHER<sup>1</sup><sup>1</sup>University of Maryland, College Park, MD**2:00PM OP-9-2-17C** Mechanical Loading of Mesenchymal Stem Cells on Electrospun Scaffolds for Ligament Tissue EngineeringR. SHAFFER<sup>1</sup>, J. KLUGE<sup>2</sup>, L. DAHLGREN<sup>3</sup>, A. GOLDSTEIN<sup>1</sup>, AND D. KAPLAN<sup>4</sup><sup>1</sup>Virginia Tech, Blacksburg, VA, <sup>2</sup>University of Pennsylvania, Philadelphia, PA, <sup>3</sup>Virginia-Maryland Regional College of Veterinary Medicine, Blacksburg, VA, <sup>4</sup>Tufts University, Medford, MA**2:15PM OP-9-2-17D** In Situ Bioluminescence Imaging of BMP-2 Expression in a Perfusion BioreactorS. J. LAPP<sup>1</sup>, H. SHEN<sup>1</sup>, L. A. BASHUR<sup>1</sup>, G. WANG<sup>1</sup>, AND A. S. GOLDSTEIN<sup>1</sup><sup>1</sup>Virginia Tech, Blacksburg, VA



**2:30PM OP-9-2-17E** Engineering Biomimetic Microenvironments for the Functional Regeneration of Vocal Fold Lamina PropriaA. J. FARRAN<sup>1</sup>, A. K. JHA<sup>1</sup>, R. L. DUNCAN<sup>1</sup>, AND X. JIA<sup>1</sup><sup>1</sup>University of Delaware, Newark, DE**2:45PM OP-9-2-17F** Characterization of Engineered Tissue Development with Biaxial Mechanical Testing and MicroscopyY. BAI<sup>1</sup>, J. D. HUMPHREY<sup>1</sup>, AND A. T. YEH<sup>1</sup><sup>1</sup>Texas A&M University, College Station, TX**\*Tissue Engineering Track sponsored by Kinetic Concepts, Inc.****Track: Undergraduate – 9-2-18****Undergraduate Research II****Chairs:** Connie Hall, Hossein Tavana**Room 13B****1:30PM OP-9-2-18A** Using Ultrasonic Decorrelation Algorithms To Improve *In Vivo* Visualization of Injected AnestheticsS. L. LIPMAN<sup>1</sup>, K. R. NIGHTINGALE<sup>1</sup>, S. GRANT<sup>2</sup>, D. MACLEOD<sup>2</sup>, AND M. L. PALMERI<sup>1,2</sup><sup>1</sup>Duke University, Durham, NC, <sup>2</sup>Duke University Medical Center, Durham, NC**1:45PM OP-9-2-18B** Experimentation and Modeling of Beta-cell Ca<sup>2+</sup> OscillationsP. EICH<sup>1</sup>, N. TAMARINA<sup>1</sup>, L. FRIDYLAND<sup>1</sup>, AND L. PHILIPSON<sup>1</sup><sup>1</sup>University of Chicago, Chicago, IL**2:00PM OP-9-2-18C** - Developing a Microbead-based, maAPC Platform to Generate Antigen-Specific Cytotoxic LymphocytesA. A. TU<sup>1</sup>, Y-L. CHIU<sup>1</sup>, M. OELKE<sup>2</sup>, AND J. SCHNECK<sup>2</sup><sup>1</sup>Johns Hopkins University, Baltimore, MD, <sup>2</sup>Johns Hopkins University School of Medicine, Baltimore, MD**2:15PM OP-9-2-18D** Monovalent PEGylated Fibrin 'A' Knob Peptides Inhibit Hemostatic Clot FormationN. M. ABOUJAMOUS<sup>1</sup>, S. E. STABENFELDT<sup>1</sup>, A. SOON<sup>1</sup>, AND T. H. BARKER<sup>1</sup><sup>1</sup>Georgia Institute of Technology, Atlanta, GA**2:30PM OP-9-2-18E** Cranberry Juice Does Not Alter Bacterial Growth but May Inhibit Bacterial AdhesionR. A. RICHARD<sup>1</sup>, A. TAO<sup>2</sup>, Y. ZHANG<sup>2</sup>, AND T. CAMESANO<sup>2</sup>Bay Path College, Longmeadow, MA, <sup>2</sup>Worcester Polytechnic Institute, Worcester, MA**2:45PM OP-9-2-18F** WRAP UP

**Track: Tissue Engineering \* – 9-3-1****Novel Biomaterials and Scaffolds – V****Chairs:** Gudrun Schmidt, Anirban Sen Gupta

Room 12A

**3:15PM OP-9-3-1A** Interfacial Polyelectrolyte Complexation (IPC) Fibers and Scaffolds for Tissue EngineeringA. C. WAN<sup>1</sup>, B. C. TAI<sup>1</sup>, K. NARAYANAN<sup>1</sup>, M. F. LEONG<sup>1</sup>, J. K. TOH<sup>1</sup>, H. LU<sup>1</sup>, C. DU<sup>1</sup>, K.-J. LECK<sup>1</sup>, S. GAO<sup>1</sup>, AND J. Y. YING<sup>1</sup><sup>1</sup>Institute of Bioengineering and Nanotechnology, Singapore, Singapore**3:30PM OP-9-3-1B** Electrospun Scaffolds with Depth-dependent Alignment to Mimic the Structure of Articular CartilageI. L. KIM<sup>1</sup>, H. G. SUNDARARAGHAVAN<sup>1</sup>, AND J. A. BURDICK<sup>1</sup><sup>1</sup>University of Pennsylvania, Philadelphia, PA**3:45PM OP-9-3-1C** Tunable Silk Fibers: Mimicking Natural Silkworm Processing with MicrofluidicsM. E. KINAHAN<sup>1</sup>, E. FILIPPIDI<sup>2</sup>, S. KÖSTER<sup>3</sup>, H. M. EVANS<sup>4</sup>, T. PFOHL<sup>5</sup>, D. L. KAPLAN<sup>6</sup>, AND J. Y. WONG<sup>1</sup><sup>1</sup>Boston University, Boston, MA, <sup>2</sup>New York University, New York, NY, <sup>3</sup>Georg-August-Universität Goettingen, Goettingen, Germany, <sup>4</sup>Max-Planck-Institute for Dynamics and Self-Organization, Goettingen, Germany, <sup>5</sup>Universität Basel, Basel, Switzerland, <sup>6</sup>Tufts University, Medford, MA**4:00PM OP-9-3-1D** Active Porous Scaffolds for Triggered Drug and Cell DeliveryX. ZHAO<sup>1</sup>, C. A. CEZARI<sup>1</sup>, AND D. J. MOONEY<sup>1</sup><sup>1</sup>Harvard University, Cambridge, MA**4:15PM OP-9-3-1E** Trifunctional Porogens for the Development of an Injectable Putty to Treat Traumatic Bone DefectsR. BUCHANAN<sup>1,2</sup>, M. MURPHY<sup>2</sup>, D. YOON<sup>3</sup>, X. LIU<sup>1,2</sup>, K. KASPER<sup>3</sup>, P. SIMMONS<sup>2</sup>, A. MIKOS<sup>3</sup>, M. FERRARI<sup>1,2</sup>, E. TASCIOTTI<sup>2,4</sup>, A. HENSLEE<sup>3</sup>, AND M. NAIR<sup>3</sup><sup>1</sup>The University of Texas at Austin, Austin, TX, <sup>2</sup>The University of Texas Health Science Center at Houston, Houston, TX, <sup>3</sup>Rice University, Houston, TX**4:30PM OP-9-3-1F** Replicating the Topography of Intestinal Basement MembraneC. PFLUGER<sup>1</sup>, AND R. CARRIER<sup>1</sup><sup>1</sup>Northeastern University, Boston, MA

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

**Track: Systems Biology, Bioinformatics and Computational Biology – 9-3-2****Systems Cell Biology****Chairs:** Timothy Galitski, Pamela Kreeger

Room 12B

**3:15PM OP-9-3-2A** Single Cell Analysis Reveals that HIV Viral Integration Position Alters the Mode of Stochastic HIV Gene Expression from Poisson to Infrequent BurstingJ. E. FOLEY<sup>1</sup>, R. SKUKSPY<sup>2</sup>, A. ARKIN<sup>1,2</sup>, AND D. V. SCHAFFER<sup>1</sup><sup>1</sup>UC Berkeley, Berkeley, CA, <sup>2</sup>Lawrence Berkeley National Lab, Berkeley, CA**3:30PM OP-9-3-2B** A Comprehensive Computational Model of Mycoplasma GenitaliumJ. SANGHVI<sup>1</sup>, J. KARR<sup>1</sup>, AND M. COVERT<sup>1</sup><sup>1</sup>Stanford University, Stanford, CA**3:45PM OP-9-3-2C** Temporal Cascades of Perturbed Biological Processes in Engineered Liver MimicsC. D. LASHER<sup>1</sup>, Y. KIM<sup>1</sup>, T. MURALI<sup>1</sup>, AND P. RAJAGOPALAN<sup>1</sup><sup>1</sup>Virginia Tech, Blacksburg, VA**4:00PM OP-9-3-2D** Pairwise Agonist Scanning of Human Platelets Reveals the High-dimensional Calcium Response to Combinatorial Mediators of ThrombosisM. S. CHATTERJEE<sup>1</sup>, J. E. PURVIS<sup>1</sup>, AND S. L. DIAMOND<sup>1</sup><sup>1</sup>University of Pennsylvania, Philadelphia, PA**4:15PM OP-9-3-2E** A Common Mechanism of Antifungal-Induced Cell Death Mediated by Reactive Oxygen SpeciesP. A. BELENKY<sup>1,2</sup>, D. CAMACHO<sup>1</sup>, AND J. J. COLLINS<sup>1,2</sup><sup>1</sup>Howard Hughes Medical Institute, Boston, MA, <sup>2</sup>Boston University, Boston, MA**4:30PM OP-9-3-2F** Computational Analysis of the Compartmentalization of Phosphatase-Mediated Regulation of EGFRC. S. MONAST<sup>1</sup>, AND M. J. LAZZARA<sup>1</sup><sup>1</sup>University of Pennsylvania, Philadelphia, PA**Track: Biomedical Imaging and Optics – 9-3-3****Imaging Hardware and Software****Chairs:** May Wang, Steve Wright

Room 19A

**3:15PM OP-9-3-3A** - An Eight Channel Parallel Transmitter for use with Existing SystemsN. A. HOLLINGSWORTH<sup>1</sup>, K. L. MOODY<sup>1</sup>, K. FENG<sup>1</sup>, M. P. MCDUGALL<sup>1</sup>, AND S. M. WRIGHT<sup>1</sup><sup>1</sup>Texas A&M University, College Station, TX**3:30PM OP-9-3-3B** - A 64-Channel Parallel MRI TransmitterK. FENG<sup>1</sup>, N. A. HOLLINGSWORTH<sup>1</sup>, J. C. BOSSHARD<sup>1</sup>, C.-W. CHANG<sup>1</sup>, K. L. MOODY<sup>1</sup>, M. P. MCDUGALL<sup>1</sup>, AND S. M. WRIGHT<sup>1</sup><sup>1</sup>Texas A&M University, College Station, TX**3:45PM OP-9-3-3C** - Automatic Color Segmentation of Histological Images for Cancer DiagnosisS. KOTHARI<sup>1</sup>, Q. CHAUDRY<sup>1</sup>, J. H. PHAN<sup>2</sup>, A. N. YOUNG<sup>3</sup>, AND M. D. WANG<sup>2</sup><sup>1</sup>Georgia Tech, Atlanta, GA, <sup>2</sup>Georgia Tech and Emory University, Atlanta, GA, <sup>3</sup>Emory University, Atlanta, GA**4:00PM OP-9-3-3D** - TissueWikiMobile: An Easy Way to Access Large-scale Histology Image Data Using iPhoneC. CHENG<sup>1</sup>, T. H. STOKES<sup>1</sup>, S. HANG<sup>1</sup>, AND M. D. WANG<sup>1</sup><sup>1</sup>Georgia Institute of Technology, Atlanta, GA**4:15PM OP-9-3-3E** - Soft-threshold Filtering Approach for Compressive Sampling based Computed Tomography ReconstructionH. YU<sup>1</sup>, AND G. WANG<sup>2</sup><sup>1</sup>Wake Forest University Health Sciences, Winston-Salem, NC, <sup>2</sup>Virginia Tech., Blacksburg, VA**4:30PM OP-9-3-3F** - Pregnant Female Anthropometry from Computed Tomography Scan for Finite Element Model DevelopmentK. L. LOFTIS<sup>1</sup>, M. G. HALSEY<sup>2</sup>, E. Y. ANTHONY<sup>2</sup>, S. M. DUMA<sup>3</sup>, AND J. D. STITZEL<sup>1</sup><sup>1</sup>VT-WFU Center for Injury Biomechanics, Winston-Salem, NC, <sup>2</sup>Wake Forest University School of Medicine, Winston-Salem, NC, <sup>3</sup>VT-WFU Center for Injury Biomechanics, Blacksburg, VA

**Track: Neural Engineering – 9-3-4****Neural Electrode Tissue Interface****Chairs:** Jeff Capadona, Dustin Tyler

Room 19B

**3:15PM OP-9-3-4A** Improving Neural Implant Biocompatibility via Biomimetic DesignT. CUI<sup>1,2</sup><sup>1</sup>University of Pittsburgh, Pittsburgh, PA, <sup>2</sup>McGowan Institute for Regenerative Medicine, Pittsburgh, PA**3:30PM OP-9-3-4B** Integrating the Prodrug Approach for Therapeutic Interventions at the Neural InterfaceW. HE<sup>1</sup>, AND Y. CAO<sup>1</sup><sup>1</sup>The University of Tennessee, Knoxville, TN**3:45PM OP-9-3-4C** Biodegradable Electronic Materials and Devices for Neural InterfacesC. J. BETTINGER<sup>1</sup><sup>1</sup>Carnegie Mellon University, Pittsburgh, PA**4:00PM OP-9-3-4D** In Situ Analysis of Brain Tissue-Implant InterfacesJ. WILLIAMS<sup>1</sup><sup>1</sup>Univ. of Wisconsin- Madison, Madison, WI**4:15PM OP-9-3-4E** Biological Constraints on Reliable Neural InterfacingR. V. BELLAMKONDA<sup>1</sup><sup>1</sup>Georgia Institute of Technology, Atlanta, GA**4:30PM OP-9-3-4F** Molecular Approaches to Understanding and Modulating Gliosis at the Cortical Electrode InterfaceJ. R. CAPADONA<sup>1,2</sup>, K. A. POTTER<sup>1,2</sup>, AND B. GUI<sup>1,2</sup><sup>1</sup>Case Western Reserve University, Cleveland, OH, <sup>2</sup>L. Stokes Cleveland Department of Veteran's Affairs, Cleveland, O**Track: Biomedical Engineering Education – 9-3-5****Learning Modules and Instructional Materials****Chairs:** Tim Allen

Room 18A

**3:15PM OP-9-3-5A** Natural Engineering: Developmental Biology as a Frontier for Engineering and Therapeutic DiscoveryJ. BUTCHER<sup>1</sup><sup>1</sup>Cornell University, Ithaca, NY**3:30PM OP-9-3-5B** Introducing Cellular Labs in BME Undergraduate CoursesS. ARCHER<sup>1</sup><sup>1</sup>Cornell University, Ithaca, NY**3:45PM OP-9-3-5C** An Argument for Writing about the History of Technology as Part of an Engineering EducationR. G. VOSS<sup>1</sup>, AND M. ALI<sup>1</sup><sup>1</sup>UT at Austin, Austin, TX**4:00PM OP-9-3-5D** Project Modules in a Course on Cellular BioengineeringA. L. SIEMINSKI<sup>1</sup><sup>1</sup>Franklin W. Olin College of Engineering, Needham, MA**4:15PM OP-9-3-5E** Rationale and Resources for a Course Module in Athletic Performance EngineeringD. C. CLARKE<sup>1</sup>, AND P. F. SKIBA<sup>2</sup><sup>1</sup>Massachusetts Institute of Technology, Cambridge, MA, <sup>2</sup>Jersey Shore University Medical Center, Neptune, NJ**4:30PM OP-9-3-5F** Engineers Be Taught To Be Creative?J. TRANQUILLO<sup>1</sup><sup>1</sup>Bucknell University, Lewisburg, PA**Track: Cellular and Molecular Engineering – 9-3-6****The Physics and Engineering of Cancer Cells and Their Microenvironment****Chairs:** Nastaran Kuhn, Jerry Lee

Room 18B

**3:15PM OP-9-3-6A** Cancer Cell Motility in a 3D MatrixD. WIRTZ<sup>1</sup><sup>1</sup>Johns Hopkins University, Baltimore, MD**3:30PM OP-9-3-6B** Using Microfluidics for Real-Time Studies of Tumor Cell Behavior under Flow or Interacting with an Intact EndotheliumI. ZERVANTONAKIS<sup>1</sup>, W. J. POLACHEK<sup>1</sup>, J. L. CHAREST<sup>2</sup>, AND R. D. KAMM<sup>1</sup><sup>1</sup>Massachusetts Institute of Technology, Cambridge, MA, <sup>2</sup>The Charles Stark Draper Laboratory, Cambridge, MA**3:45PM OP-9-3-6C** Metastatic Cells from Breast and Prostate Generate Increased Force Compared to Non-Metastatic CellsC. KRANING-RUSH<sup>1</sup>, S. CAREY<sup>1</sup>, J. CALIFANO<sup>1</sup>, AND C. REINHART-KING<sup>1</sup><sup>1</sup>Cornell University, Ithaca, NY**4:00PM OP-9-3-6D** Cell Stiffness Dictates Cytoskeleton Dependent Cancer Cell Invasion and SignalingV. SWAMINATHAN<sup>1</sup>, K. MYTHREYE<sup>2</sup>, E. O'BRIEN<sup>1</sup>, G. C. BLOBE<sup>2</sup>, AND R. SUPERFINE<sup>1</sup><sup>1</sup>University of North Carolina, Chapel Hill, NC, <sup>2</sup>Duke University, Durham, NC**4:15PM OP-9-3-6E** Vascular Recruitment of Retinoblastoma Stem Cells by Multicellular Adhesive Interactions with Circulating LeukocytesY. GENG<sup>1</sup>, G. M. SEIGEL<sup>2</sup>, AND M. R. KING<sup>1</sup><sup>1</sup>Cornell University, Ithaca, NY, <sup>2</sup>State University of New York at Buffalo, Buffalo, NY**4:30PM OP-9-3-6F** Interstitial Flow Affects Invasive Potentials of Metastatic Tumor CellsH. QAZI<sup>1</sup>, Z-D. SHI<sup>1</sup>, X-Y. JI<sup>1</sup>, AND J. M. TARBELL<sup>1</sup><sup>1</sup>The City College of New York, New York, NY**Track: Cardiovascular Engineering - 9-3-7****Heart Valve Biomechanics II: Mechanics and Simulation****Chairs:** Zhaoming He, Sarah Wells

Room 18C

**3:15PM OP-9-3-7A** An FSI Study of Aortic Valve Sparing Procedures on Coaptation and DurabilityG. MAROM<sup>1</sup>, R. HAJ-ALI<sup>1</sup>, M. ROSENFELD<sup>1</sup>, E. RAANANI<sup>2</sup>, AND H. J. SCHAEFERS<sup>3</sup><sup>1</sup>Tel-Aviv University, Tel Aviv, Israel, <sup>2</sup>Chaim Sheba Medical Center, Tel Hashomer, Israel, <sup>3</sup>University Hospitals of Saarland, Homburg, Saarland, Germany**3:30PM OP-9-3-7B** Biomechanical Remodeling in Valves and Aortas of FBNI Mutant Mice: Insights into Marfan SyndromeR. A. GOULD<sup>1</sup>, R. SINHA<sup>1</sup>, H. AZIZ<sup>2</sup>, R. ROUF<sup>2</sup>, D. JUDGE<sup>2</sup>, AND J. BUTCHER<sup>1</sup><sup>1</sup>Cornell University, Ithaca, NY, <sup>2</sup>Johns Hopkins University School of Medicine, Baltimore, MD**3:45PM OP-9-3-7C** In Situ Estimation of Extracellular Matrix Stiffness-Interstitial Cell Mechanical Coupling in the Heart Valve LeafletM. S. SACKS<sup>1</sup><sup>1</sup>University of Pittsburgh, Pittsburgh, PA

**4:00PM OP-9-3-7D** Vortex Interaction and Dissipation under Edge-to-Edge RepairL. SHI<sup>1</sup>, Y. HU<sup>1</sup>, AND Z. HE<sup>1</sup><sup>1</sup>Texas Tech University, Lubbock, TX**4:15PM OP-9-3-7E** In Vivo Dynamic Stresses in the Functional Mitral ValveC. E. ECKERT<sup>1</sup>, M. MORITA<sup>2</sup>, K. KOOMALSINGH<sup>2</sup>, M. MINAKAWA<sup>2</sup>, R. C. GORMAN<sup>2</sup>, J. H. GORMAN III<sup>2</sup>, AND M. S. SACKS<sup>1</sup><sup>1</sup>University of Pittsburgh, Pittsburgh, PA, <sup>2</sup>University of Pennsylvania, Philadelphia, PA**4:30PM OP-9-3-7F** Remodeling of the Mitral Valve in Response to the Physiological Effects of PregnancyC. PIERLOT<sup>1</sup>, A. MOELLER<sup>1</sup>, M. LEE<sup>1</sup>, AND S. WELLS<sup>1</sup><sup>1</sup>Dalhousie University, Halifax, NS, Canada**Track: Cardiovascular Engineering – 9-3-8****Thrombosis and Hemostasis****Chairs:** Guillermo Ameer, Mariah Hahn**Room 18D****3:15PM OP-9-3-8A** In Vitro Modulation of Shear-Induced Platelet SensitizationJ. SHERIFF<sup>1</sup>, G. GIRDHAR<sup>1</sup>, M. XENOS<sup>1</sup>, J. JESTY<sup>1</sup>, AND D. BLUESTEIN<sup>1</sup><sup>1</sup>Stony Brook University, Stony Brook, NY**3:30PM OP-9-3-8B** - Dynamic Spreading of Platelets using Reflection Interference Contrast MicroscopyD. LEE<sup>1</sup>, K. P. FONG<sup>1</sup>, L. F. BRASS<sup>1</sup>, AND D. A. HAMMER<sup>1</sup><sup>1</sup>University of Pennsylvania, Philadelphia, PA**3:45PM OP-9-3-8C** - Novel FRET Proteins that Quantify Structural Changes in VWF and ADAMTS-13 Mediated ProteolysisK. M. DAYANANDA<sup>1</sup>, S. GOGIA<sup>1</sup>, G. P. VISENTIN<sup>2</sup>, AND S. NEELAMEGHAM<sup>1</sup><sup>1</sup>State University of New York at Buffalo, Buffalo, NY, <sup>2</sup>GTI Diagnostics, Waukesha, WI**4:00PM OP-9-3-8D** - Development of a Novel Nano Particle Scaffold to Regenerate Endothelium *In Situ*L-C. SU<sup>1,2</sup>, R. TRAN<sup>1,2</sup>, J. YANG<sup>1,2</sup>, AND K. T. NGUYEN<sup>1,2</sup><sup>1</sup>University of Texas at Arlington, Arlington, TX, <sup>2</sup>University of Southwestern Medical Center at Dallas, Dallas, TX**4:15PM OP-9-3-8E** - In Vivo Performance of Small Diameter Vascular Grafts Lined with Endothelial Progenitor Cells Overexpressing ThrombomodulinJ. D. STRONCEK<sup>1</sup>, R. LICHENG<sup>1</sup>, J. H. LAWSON<sup>2</sup>, B. KLITZMAN<sup>1</sup>, AND W. M. REICHERT<sup>1</sup><sup>1</sup>Duke University, Durham, NC, <sup>2</sup>Duke University Medical Center, Durham, NC**4:30PM OP-9-3-8F** - Thrombogenicity Optimization of Ventricular Assist Devices (VAD) - Case-Study with the HeartAssist 5G. GIRDHAR<sup>1</sup>, Y. ALEMU<sup>1</sup>, M. XENOS<sup>1</sup>, R. BENKOWSKI<sup>2</sup>, M. SLEPIAN<sup>3</sup>, J. JESTY<sup>1</sup>, S. EINAV<sup>1</sup>, AND D. BLUESTEIN<sup>1</sup><sup>1</sup>Stony Brook University, Stony Brook, NY, <sup>2</sup>MicroMed Cardiovascular Inc., Houston, TX, <sup>3</sup>University of Arizona, Tucson, AZ**Track: Respiratory Engineering – 9-3-9****Lung Computational Fluid Dynamics and Particle Deposition****Chairs:** Ching-Long Lin, Merryn Tawhai**Room 17A****3:15PM OP-9-3-9A** Effect of Alveolar Wall Motion on Simulated Aerosol Dispersion in the LungC. DAROUEUNE<sup>1</sup>, AND B. MA<sup>2</sup><sup>1</sup>University of California, San Diego, La Jolla, CA, <sup>2</sup>University of Vermont, Burlington, VT**3:30PM OP-9-3-9B** An Initial Analysis of Enhanced Condensational Growth (ECG) for Respiratory Drug DeliveryG. TIAN<sup>1</sup>, G. SU<sup>1</sup>, M. HINDLE<sup>1</sup>, AND P. W. LONGEST<sup>1</sup><sup>1</sup>Virginia Commonwealth University, Richmond, VA**3:45PM OP-9-3-9C** Prediction of the Focal Sites of Ozone-Induced Tissue Injury in the Respiratory Tract through Numerical Simulation in Anatomically-Accurate Airway StructuresB. KESHAVARZI<sup>1</sup>, J. ULTMAN<sup>2</sup>, AND A. BORHAN<sup>2</sup><sup>1</sup>The Pennsylvania State University, University Park, PA, <sup>2</sup>The Pennsylvania State University, University Park, PA**4:00PM OP-9-3-9D** Comparative Computational Fluid Dynamics Simulations of Airflows in the Full Respiratory System of Rats, Monkeys, and HumansS. KABILAN<sup>1</sup>, J. P. CARSON<sup>2</sup>, R. E. JACOB<sup>2</sup>, A. P. KUPRAT<sup>2</sup>, K. R. MINARD<sup>2</sup>, R. GLENNY<sup>1</sup>, E. M. POSTLETHWAIT<sup>3</sup>, D. R. EINSTEIN<sup>2</sup>, AND R. A. CORLEY<sup>2</sup><sup>1</sup>University of Washington, Seattle, WA, <sup>2</sup>Pacific Northwest National Laboratory, Richland, WA, <sup>3</sup>University of Alabama at Birmingham, Birmingham, AL**4:15PM OP-9-3-9E** Numerical Simulations of the Propagation of a Liquid Plug through a 2D Airway BifurcationB. L. VAUGHAN, JR.<sup>1</sup>, AND J. B. GROTBORG<sup>1</sup><sup>1</sup>University of Michigan, Ann Arbor, MI**4:30PM OP-9-3-9F** Multiscale Simulation of Airflow and Particle Transport in a CT-based Human Airway ModelC-L. LIN<sup>1</sup>, A. R. LAMBERT<sup>1</sup>, M. H. TAWHAI<sup>2</sup>, AND E. A. HOFFMAN<sup>1</sup><sup>1</sup>The University of Iowa, Iowa City, IA, <sup>2</sup>University of Auckland, Auckland, New Zealand**Track: Orthopedic and Rehabilitation Engineering – 9-3-10****Skeletal Biomechanics****Chairs:** Yingxin Gao, Deepak Vashishth**Room 17B****3:15PM OP-9-3-10A** A Finite Element Model of the Effects of Subchondral Bone Geometrical and Mechanical Properties on Cartilage Axial Contact LoadingK. A. WALLER<sup>1</sup>, M. J. RAINBOW<sup>1</sup>, D. C. MOORE<sup>2</sup>, AND J. T. CRISCO<sup>2</sup><sup>1</sup>Brown University, Providence, RI, <sup>2</sup>Alpert Medical School of Brown University and Rhode Island Hospital, Providence, RI**3:30PM OP-9-3-10B** Calcium- and Phosphorus-Supplemented Diet Increases Bone Quantity and Strength in Exercising MiceM. A. FRIEDMAN<sup>1</sup>, A. M. BAILEY<sup>1</sup>, AND D. H. KOHN<sup>1</sup><sup>1</sup>University of Michigan, Ann Arbor, MI**3:45PM OP-9-3-10C** Local and Systemic Effects of Dynamic Hydraulic Pressure Stimulation on Mitigation of Bone LossM. HU<sup>1</sup>, J. CHENG<sup>1</sup>, S. FERRERI<sup>1</sup>, F. SERRA-HSU<sup>1</sup>, W. LIN<sup>1</sup>, AND Y-X. QIN<sup>1</sup><sup>1</sup>Stony Brook University, Stony Brook, NY

**4:00PM OP-9-3-10D** Static Evaluation of Shear Loading Associated With Extension/Compression of the CerviCore Intervertebral DiscA. VALDEVIT<sup>1,2</sup>, K. STASCAVAGE<sup>1</sup>, M. BROPHY<sup>1</sup>, A. LISI<sup>1</sup>, T. ERRICO<sup>2</sup>, AND A. RITTER<sup>1</sup><sup>1</sup>The Stevens Institute of Technology, Hoboken, NJ, <sup>2</sup>NYU Hospital for Joint Diseases, New York, NY**4:15PM OP-9-3-10E** Effects of Muscle Activation on Occupant Kinematics in Frontal Sled TestsS. BEEMAN<sup>1</sup>, A. KEMPER<sup>1</sup>, M. MADIGAN<sup>2</sup>, AND S. DUMA<sup>1</sup><sup>1</sup>Virginia Tech - Wake Forest, Blacksburg, VA, <sup>2</sup>Virginia Tech, Blacksburg, VA**4:30PM OP-9-3-10F** The Rat Skull is an "Energy Pathway" to the Brain during Shock Wave ExposureR. BOLANDER<sup>1</sup>, C. BIR<sup>1</sup>, B. MATHIE<sup>1</sup>, AND P. VANDEVORD<sup>1,2</sup><sup>1</sup>Wayne State University, Detroit, MI, <sup>2</sup>John D. Dingell VA Medical Center, Research & Development Service, Detroit, MI**Track: Devices: Nano to Micro – 9-3-11****Biosensors, Bio-Interfaces and Implantable Devices – II****Chairs:** John McDevitt, John X.J. Zhang**Room 16A****3:15PM OP-9-3-11A** Bioactive Electroconductive Hydrogels as Hosting Membranes for Enzyme-based BiosensorsC. KOTANEN<sup>1</sup>, AND A. GUISEPPI-ELIE<sup>2</sup><sup>1</sup>Clemson University, Anderson, SC, <sup>2</sup>Clemson University, Clemson, SC**3:30PM OP-9-3-11B** Magnetoelastic Materials as Novel Bioactive Coatings for Control of Cell AdhesionE. VLAISAVLJEVICH<sup>1</sup>, H. HOLMES<sup>1</sup>, K. ONG<sup>1</sup>, AND R. RAJACHAR<sup>1</sup><sup>1</sup>Michigan Technological University, Houghton, MI**3:45PM OP-9-3-11C** In Vivo Glucose Monitoring with Polyethylene Glycole (PEG) Bonded Hydrogel FibersY. HEO<sup>1,2</sup>, H. SHIBATA<sup>2,3</sup>, T. OKITSU<sup>2,4</sup>, Y. TSUDA<sup>1,5</sup>, T. KAWANISHI<sup>2,3</sup>, AND S. TAKEUCHI<sup>1,2</sup><sup>1</sup>The University of Tokyo, Meguro-ku, Tokyo, Japan, <sup>2</sup>BEANS Project, Meguro-ku, Tokyo, Japan, <sup>3</sup>TERUMO Co., Ashigarakami, Kanagawa, Japan, <sup>4</sup>Kyoto University, Sakyo, Kyoto, Japan**4:00PM OP-9-3-11D** Large Deflection, Linear Transduction Pressure Sensor for Ventricular ResearchJ. V. CLARK<sup>1</sup>, AND A. G. AKINGBA<sup>2</sup><sup>1</sup>Purdue University, West Lafayette, IN, <sup>2</sup>Indiana University, Indianapolis, IN**4:15PM OP-9-3-11E** Surface Plasmon Resonance for Dynamic Analysis of Cell Secreting BehaviorS.-H. WU<sup>1</sup>, M.-T. WEI<sup>2</sup>, A. CHIOU<sup>1</sup>, P.-K. WEI<sup>3</sup>, AND X. CHENG<sup>2</sup><sup>1</sup>National Yang-Ming University, Taipei, Taiwan, <sup>2</sup>Lehigh University, Bethlehem, PA, <sup>3</sup>Academia Sinica, Taipei, Taiwan, Taiwan**4:30PM OP-9-3-11F** Development of a Minimally Invasive Bladder Pressure Monitoring SystemJ. N. WEAVER<sup>1</sup>, J. C. ALSPAUGH<sup>1</sup>, AND B. BEHKAM<sup>1</sup><sup>1</sup>Virginia Tech, Blacksburg, VA**Track: New Frontiers in Bioengineering – 9-3-12**  
**Systems-Level Approaches in Bioengineering****Chairs:** Jason Papin, Shayn Peirce-Cottler**Room 16B****3:15PM OP-9-3-12A** Direct Reprogramming as a Random Drift in Cell StateK. SAHA<sup>1</sup>, J. HANNA<sup>1</sup>, B. PANDO<sup>2</sup>, A. VAN OUDENAARDEN<sup>2</sup>, AND R. JAENISCH<sup>1</sup><sup>1</sup>Whitehead Institute/MIT, Cambridge, MA, <sup>2</sup>MIT, Cambridge, MA**3:30PM OP-9-3-12B** Proteolytic Activity Matrix (PrAM) Analysis for Simultaneous Determination of Multiple Protease ActivitiesM. A. MILLER<sup>1</sup>, L. BARKAL<sup>1</sup>, K. JENG<sup>2</sup>, L. G. GRIFFITH<sup>1</sup>, AND D. A. LAUFFENBURGER<sup>1</sup><sup>1</sup>Massachusetts Inst. of Tech., Cambridge, MA, <sup>2</sup>Boston Univ. School of Public Health, Boston, MA**3:45PM OP-9-3-12C** Rapid Miniaturized Assays to Quantify Glycosyltransferase ActivityS. A. PATIL<sup>1</sup>, AND S. NEELAMEGHAM<sup>1</sup><sup>1</sup>The State University of New York at Buffalo, Buffalo, NY**4:00PM OP-9-3-12D** Ex Vivo Perfusion Optimization of Donor Liver Grafts for Transplantation and Cell IsolationM.-L. IZAMIS<sup>1</sup>, T. HERMAN<sup>1</sup>, B. UYGUN<sup>1</sup>, F. BERTHIAUME<sup>1</sup>, K. UYGUN<sup>1</sup>, AND M. YARMUSH<sup>1</sup><sup>1</sup>Massachusetts General Hospital, Boston, MA**4:15PM OP-9-3-12E** Model of Lingual Motion During Swallowing Derived From Mechanics of Myofiber Tracts Imaged by MRIS. M. MIJAILOVICH<sup>1,2</sup>, B. STOJANOVIC<sup>3,4</sup>, M. KOJIC<sup>1,5</sup>, A. LIANG<sup>6</sup>, V. J. WEDEEN<sup>7</sup>, AND R. J. GILBERT<sup>2</sup><sup>1</sup>Harvard School of Public Health, Boston, MA, <sup>2</sup>Caritas St. Elizabeth's Medical Center, Boston, MA, <sup>3</sup>Research and Development Center for Bioengineering, Kragujevac, Serbia, Yugoslavia, <sup>4</sup>University of Kragujevac, Kragujevac, Serbia, Yugoslavia, <sup>5</sup>The University of Texas Health Science Center, Houston, TX, <sup>6</sup>Massachusetts Institute of Technology, Cambridge, MA, <sup>7</sup>Massachusetts General Hospital, Charlestown, MA**4:30PM OP-9-3-12F** A Hybrid Game Theoretical Approach for Stochastic Control of Drug Delivery in HIV InfectionJ. WU<sup>1</sup>, S. LENAGHAN<sup>1</sup>, AND M. ZHANG<sup>1</sup><sup>1</sup>University of Tennessee, Knoxville, TN**Track: Drug Delivery Systems\* – 9-3-13****Targeted Drug Delivery – III****Chairs:** Daniel Kamei, Justin Saul**Room 14****3:15PM OP-9-3-13A** Engineered Transferrin Improves the Delivery of Therapeutics to Brain TumorsD. J. YOON<sup>1</sup>, G. Y. LAM<sup>1</sup>, B. H. KWAN<sup>1</sup>, F. C. CHAO<sup>1</sup>, T. P. NICOLAIDES<sup>2</sup>, J. J. PHILLIPS<sup>2</sup>, A. B. MASON<sup>3</sup>, W. A. WEISS<sup>2</sup>, AND D. T. KAMEI<sup>1</sup><sup>1</sup>UCLA, Los Angeles, CA, <sup>2</sup>UCSF, San Francisco, CA, <sup>3</sup>University of Vermont, Burlington, VT**3:30PM OP-9-3-13B** Nitric Oxide Delivery to Glioblastomas: Specificity and Therapeutic EfficacyS. SAFDAR<sup>1</sup>, AND L. J. TAITE<sup>1</sup><sup>1</sup>Georgia Institute of Engineering, Atlanta, GA**3:45PM OP-9-3-13C** Development of Enzyme-Activated Nanoconjugates for Hepatic Cancer TherapyS. MEDINA<sup>1</sup>, M. CHEVLIKOV<sup>1</sup>, D. S. SHEWACH<sup>1</sup>, W. D. ENSMINGER<sup>1</sup>, AND M. E. EL-SAYED<sup>1</sup><sup>1</sup>University of Michigan, Ann Arbor, MI

**4:00PM OP-9-3-13D** Targeted Virus Nanoparticles for Localized Chemotherapy of Breast CancerF. WEI<sup>1</sup>, K. I. MCCONNELL<sup>1</sup>, T-K. YU<sup>2</sup>, AND J. SUH<sup>1</sup><sup>1</sup>Rice University, Houston, TX, <sup>2</sup>The University of Texas M. D. Anderson Cancer Center, Houston, TX**4:15PM OP-9-3-13E** Targeting Pc 4 Conjugated Gold Nanoparticles to Tumors Improves Drug Accumulation and PDT EfficacyA-M. BROOME<sup>1</sup>, Y. CHENG<sup>1</sup>, J. MEYERS<sup>1</sup>, R. S. AGNES<sup>1</sup>, M. E. KENNEY<sup>1</sup>, C. BURDA<sup>1</sup>, AND J. P. BASILION<sup>1</sup><sup>1</sup>Case Western Reserve University, Cleveland, OH**4:30PM OP-9-3-13F** Stem Cell-Directed Theranostic Nanovectors for Cancer InterventionJ. O. MARTINEZ<sup>1</sup>, F. AMAYA<sup>2</sup>, R. SERDA<sup>1</sup>, X. LIU<sup>1</sup>, M. FERRARI<sup>1,3</sup>, M. KOLONIN<sup>2</sup>, AND E. TASCIOTTI<sup>1</sup><sup>1</sup>The University of Texas Health Science Center, Houston, TX, <sup>2</sup>The University of Texas Health Science Center - Houston, Houston, TX, <sup>3</sup>The University of Texas MD Anderson Cancer Center, Houston, TX

\* Drug Delivery Systems Track is sponsored by Acta Biomaterialia

**Track: New Frontiers in Bioengineering – 9-3-14****Cellular and Subcellular Mechanics****Chairs:** Roger Kamm, Mohammed Mofrad

Room 15

**3:15PM OP-9-3-14A** Measuring Mechanical Tension Across Vinculin Reveals Regulation of Focal Adhesion DynamicsB. D. HOFFMAN<sup>1</sup>, C. GRASHOFF<sup>1</sup>, M. D. BRENNER<sup>2</sup>, R. ZHOU<sup>2</sup>, M. PARSONS<sup>3</sup>, M. T. YANG<sup>4</sup>, M. A. MCLEAN<sup>2</sup>, S. G. SLIGAR<sup>2</sup>, C. S. CHEN<sup>4</sup>, T. HA<sup>2</sup>, AND M. A. SCHWARTZ<sup>1</sup><sup>1</sup>University of Virginia, Charlottesville, VA, <sup>2</sup>University of Illinois, Urbana, IL, <sup>3</sup>King's College London, London, SE<sup>1</sup> <sup>1</sup>UL, United Kingdom, <sup>4</sup>University of Pennsylvania, Philadelphia, PA**3:30PM OP-9-3-14B** Programmed Subcellular to Study the Dynamics of Cell DetachmentB. E. WILDT<sup>1</sup>, P. C. SEARSON<sup>1</sup>, AND D. WIRTZ<sup>1</sup><sup>1</sup>Johns Hopkins University, Baltimore, MD**3:45PM OP-9-3-14C** Mechanical Behavior of Neurons in Live Drosophila EmbryosJ. RAJAGOPALAN<sup>1</sup>, A. TOFANGCHI<sup>1</sup>, AND T. A. SAIF<sup>1</sup><sup>1</sup>University of Illinois at Urbana-Champaign, Urbana, IL**4:00PM OP-9-3-14D** The Cell Nucleus as a Dominant Structure in the Mechanics of Adult Stem CellsA. J. RIBEIRO<sup>1</sup>, AND K. N. DAHL<sup>1</sup><sup>1</sup>Carnegie Mellon University, Pittsburgh, PA**4:15PM OP-9-3-14E** A Coarse-grained Model of the Functional State of the Nuclear Pore ComplexR. MOUSSAVI BAYGI<sup>1</sup>, Y. JAMALI<sup>1</sup>, R. KARIMI<sup>2</sup>, AND M. MOFRAD<sup>1</sup><sup>1</sup>UC Berkeley, Berkeley, CA, <sup>2</sup>Massachusetts Institute of Technology, Cambridge, MA**4:30PM OP-9-3-14F** Substrate Stiffness and Cell Area Predict Traction Stresses in Single Cells and Cells in ContactJ. P. CALIFANO<sup>1</sup>, AND C. A. REINHART-KING<sup>1</sup><sup>1</sup>Cornell University, Ithaca, NY**Track: Tissue Engineering \* – 9-3-15****Stem Cells and Tissue Engineering – III****Chairs:** Catherine Kuo, Fan Yang

Ballroom E

**3:15PM OP-9-3-15A** Geometric Control of Stem Cell Motility in 3D Synthetic ScaffoldsS. PEYTON<sup>1</sup><sup>1</sup>MIT, Cambridge, MA**3:30PM OP-9-3-15B** A Multilayer Hydrogel Capable of Regenerating Zonally Organized Articular Cartilage from a Single Stem Cell PopulationL. H. NGUYEN<sup>1</sup>, N. SAXENA<sup>1</sup>, AND K. ROY<sup>1</sup><sup>1</sup>University of Texas at Austin, Austin, TX**3:45PM OP-9-3-15C** Elastomeric Tissue Constructs Mimicking Structural and Mechanical Properties and 3-D Cellular Anisotropy of Soft TissuesJ. GUAN<sup>1</sup>, F. WANG<sup>1</sup>, AND Z. LI<sup>1</sup><sup>1</sup>The Ohio State University, Columbus, OH**4:00PM OP-9-3-15D** Effects of Nanog and Oct4 Overexpression on Mesenchymal Stem Cells for Vascular Tissue EngineeringJ. HAN<sup>1</sup>, S. ROW<sup>1</sup>, D. D. SWARTZ<sup>2</sup>, AND S. T. ANDREADIS<sup>1</sup><sup>1</sup>University at Buffalo, The State University of New York, Amherst, NY, <sup>2</sup>Women and Children's Hospital of Buffalo, University at Buffalo, The State University of New York, Buffalo, NY**4:15PM OP-9-3-15E** Engineering Stem Cell-interactive Biomaterials for the Treatment of Inflammatory DiseasesC. GRIFFITH<sup>1</sup>, A. L'HUILLIER<sup>2</sup>, D. BOLIKAL<sup>1</sup>, Y. SHI<sup>2</sup>, J. KOHN<sup>1</sup>, AND P. V. MOGHE<sup>1</sup><sup>1</sup>Rutgers University, Piscataway, NJ, <sup>2</sup>Robert Wood Johnson Medical School, UMDNJ, Piscataway, NJ, <sup>3</sup>Robert Wood Johnson Medical School, Piscataway, NJ**4:30PM OP-9-3-15F** Enhancement of Skeletal Muscle Stem Cell Engraftment by Dual Delivery of VEGF and IGF-I from a Macroporous Alginate GelC. BORSELLI<sup>1</sup>, C. A. CEZAR<sup>1</sup>, D. SHVARTSMAN<sup>1</sup>, H. H. VANDENBURGH<sup>2</sup>, AND D. J. MOONEY<sup>1</sup><sup>1</sup>Harvard University, Cambridge, MA, <sup>2</sup>Brown University, Providence, RI

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**Track: Tissue Engineering \* – 9-3-16****Controlled Release in Tissue Engineering****Chairs:** Debra Auguste, Danielle Benoit

Ballroom F

**3:15PM OP-9-3-16A** Release of TGF- from PEGylated Fibrin Gels Promotes EC Stabilization and SMC DifferentiationC. T. DRINNAN<sup>1</sup>, R. S. STOWERS<sup>1</sup>, M. A. ALEXANDER<sup>1</sup>, AND L. J. SUGGS<sup>1</sup><sup>1</sup>University of Texas at Austin, Austin, TX**3:30PM OP-9-3-16B** Sustained Protein Release from Novel Aptamer-Functionalized HydrogelsB. SOONTORNWORAJIT<sup>1</sup>, J. ZHOU<sup>1</sup>, M. T. SHAW<sup>1</sup>, T-H. FAN<sup>1</sup>, AND Y. WANG<sup>1</sup><sup>1</sup>University of Connecticut, Storrs, CT**3:45PM OP-9-3-16C** Electrospun Fiber – Hydrogel Controlled Release CompositesN. HAN<sup>1</sup>, J. JOHNSON<sup>1</sup>, K. PARIKH<sup>1</sup>, P. BRADLEY<sup>1</sup>, A. HISSONG<sup>1</sup>, J. LANNUTTI<sup>1</sup>, AND J. O. WINTER<sup>1</sup><sup>1</sup>The Ohio State University, Columbus, OH

**4:00PM OP-9-3-16D** Covalent Conjugation of Transforming Growth Factor-beta1 to Fibrin Hydrogel for Tissue EngineeringM-S. LIANG<sup>1</sup>, AND S. T. ANDREADIS<sup>1</sup><sup>1</sup>State University of New York at Buffalo, Amherst, NY**4:15PM OP-9-3-16E** Nano-Structured Silicon/Polymer Composite Microspheres for Sustained Release of BiomoleculesD. FAN<sup>1</sup><sup>1</sup>The University of Texas Health Science Center at Houston, Houston, TX**4:30PM OP-9-3-16F** CANCELED

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**Track:Tissue Engineering \* – 9-3-17****Bioinspired Materials****Chairs:** Joel Collier, Sarah Stabenfeldt

Ballroom G

**3:15PM OP-9-3-17A** Bioinspired Collagen-Binding Peptidoglycans – Designing Key Tissue Ingredients for Tissue EngineeringJ. PADERI<sup>1</sup>, K. STUART<sup>1</sup>, AND A. PANITCH<sup>1</sup><sup>1</sup>Purdue University, West Lafayette, IN**3:30PM OP-9-3-17B** Tunable Proteolytic Degradation of Molecularly Engineered PEG Hydrogels to Enhance Cellular InvasionJ. PATTERSON<sup>1</sup>, AND J. A. HUBBELL<sup>1</sup><sup>1</sup>Ecole Polytechnique Fédérale de Lausanne, Lausanne, Vaud, Switzerland**3:45PM OP-9-3-17C** General Bioinspired Platform for the Engineering of Novel “Smart” Protein-PolymersF. GARCIA QUIROZ<sup>1</sup>, AND A. CHILKOTI<sup>1</sup><sup>1</sup>Duke University, Durham, NC**4:00PM OP-9-3-17D** Engineering Biomaterial-Associated Complement Activation for Immune ModulationS. N. THOMAS<sup>1</sup>, M. A. SWARTZ<sup>1</sup>, AND J. A. HUBBELL<sup>1</sup><sup>1</sup>Swiss Federal Institute of Technology, Lausanne, VD, Switzerland**4:15PM OP-9-3-17E** SIP-Enhanced Vascularization in Porous Poly(ethylene glycol) Modular Scaffolds In VivoP. K. Nguyen<sup>1</sup>, M. R. MacEwan<sup>1</sup>, L. Li<sup>1</sup>, L. V. Wang<sup>1</sup>, and D. L. Elbert<sup>1</sup><sup>1</sup>Washington University in St. Louis, Saint Louis, MO**4:30PM OP-9-3-17F** Insights from Biology for the Development of Tissue Engineering Scaffolds: the Beetle ExoskeletonP. A. HUBER<sup>1</sup>, J. LOMAKIN<sup>1</sup>, R. THOMAS<sup>2</sup>, Y. ARAKANE<sup>3</sup>, K. J. KRAMER<sup>3</sup>, R. W. BEEMAN<sup>4</sup>, M. R. KANOST<sup>3</sup>, AND S. H. GEHRKE<sup>1</sup><sup>1</sup>University of Kansas, Lawrence, KS, <sup>2</sup>Haskell Indian Nations University, Lawrence, KS,<sup>3</sup>Kansas State University, Manhattan, KS, <sup>4</sup>Grain Marketing and Production Research Center, US Department of Agriculture, Manhattan, KS

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## KEY TO PROGRAM CODES:

**PS** – Poster Session

**OP** – Oral Presentation

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Biomedical Engineering at Cornell University focuses on interdisciplinary research to achieve a quantitative understanding of human biology at all spatial and temporal scales with the goal of improving human health. The Department has a close relationship with Weill Cornell Medical College and its associated hospitals in New York City, including an "Immersion Term" during which all Ph.D. students spend 7 weeks in a clinical experience at the Medical College. Cornell University is a comprehensive university with outstanding programs of teaching and research in all areas of human inquiry which has its main campus at Ithaca in the Finger Lakes Region of upstate New York. The Biomedical Engineering Department has close collaborations with a wide variety of other departments in Ithaca, especially with those in the Colleges of Engineering, Veterinary Medicine, Agriculture and Life Sciences, Arts and Sciences, and Human Ecology.

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#### DEPARTMENT OF BIOMEDICAL ENGINEERING

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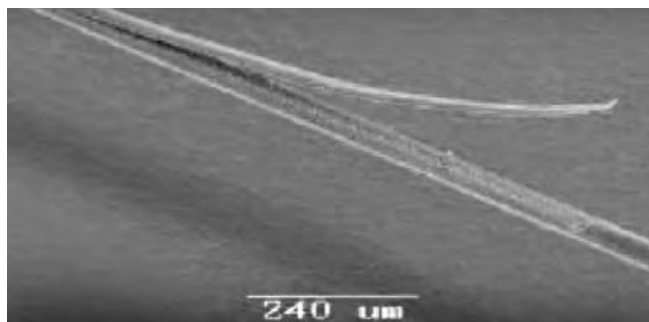
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E [SBHSE@asu.edu](mailto:SBHSE@asu.edu)  
W [www.bme.arizona.edu](http://www.bme.arizona.edu)

The Biomedical Engineering Graduate Interdisciplinary Program at the University of Arizona offers exciting opportunities for students interested in research and training related to biomedical engineering. Students can learn in a broad range of areas, integrating engineering, mathematics, biology, and medicine in a highly collaborative and multi-disciplinary environment. The BME-IDP offers Doctor of Philosophy and Masters of Science degrees as well as graduate minor degrees in related disciplines. Doctoral students accepted into the BME program can participate in a number of specialized training programs.

BOOTH # 413

**University of Arkansas****BIOMEDICAL ENGINEERING PROGRAM**

3189 Bell Engineering  
Fayetteville, AR 72701  
P 479-575-7780  
E [bwhill@uark.edu](mailto:bwhill@uark.edu)  
W [www.engr.uark.edu](http://www.engr.uark.edu)

The Biomedical Engineering Program at the University of Arkansas offers MS and PhD degrees. Our active faculty has research programs in: Organ Regeneration; Cell and Molecular Imaging; Nanobiotechnology; Vascular Systems Biology and Physiology; Computational and Multiscale Modeling; Molecular Genetics and Cell Biology in Disease Prevention; Biomaterials; Tissue Engineering; and Vaccine and Immunotherapy Delivery Systems. Stop by our booth and learn how well qualified students can earn \$10,000 to \$20,000 per year on top of standard assistantship stipends!

BOOTH # 501

**University of California at Davis**

Biomedical Engineering  
One Shields Avenue  
Davis, CA 95616  
P 530-752-6978  
E [jcyhu@ucdavis.edu](mailto:jcyhu@ucdavis.edu)  
W [www.bme.ucdavis.edu](http://www.bme.ucdavis.edu)

BME at UC Davis consists of 22 primary faculty and a graduate group of ~70 members spanning the Medical and Veterinary Schools. Our mission is to combine exceptional teaching with state-of-the-art research to prepare students for challenges in academics and industry. Visit our exhibit to learn about our BS program emphasizing bio-molecular engineering and PhD programs in imaging, cell and molecular systems, and biomechanics.

BOOTH # 521

**University of California, Irvine****DEPARTMENT OF BIOMEDICAL ENGINEERING**

3120 Natural Sciences II  
Irvine, CA 92697-2715  
P 949-824-3494  
E [kstephen@uci.edu](mailto:kstephen@uci.edu)  
W [www.wng.uci.edu/dept/bme](http://www.wng.uci.edu/dept/bme)

The Department of Biomedical Engineering at UCI has 16 faculty, 5 staff, 525 undergraduates, and 129 graduate students, with significant potential for growth. Our research programs are supported by major centers including the Beckman Laser Institute, the Laboratory for Fluorescence Dynamics, the Micro/Nano Fluidics Fundamentals Focus Center, and the Edwards Lifesciences Center for Advanced Cardiovascular Technology.



BOOTH # 608

**University of California at Riverside****DEPARTMENT OF BIOENGINEERING**

900 University Drive  
Bourns Hall, Room A 220  
Riverside, CA 92521  
P 951-827-6416  
E [jerome.schultz@ucr.edu](mailto:jerome.schultz@ucr.edu)  
W [www.bioeng.ucr.edu](http://www.bioeng.ucr.edu)

Departmental research encompasses intracellular biosensors, cell signal transduction pathways, mathematical and in-silico computational modeling, immune and connective tissue pathologies, and membrane electromechanics. Other important research areas include biophotonic technologies, high-throughput screening of drugs, metabolomics, protein folding and thermodynamics of proteins in solutions.

BOOTH # 309

**University of Illinois at Urbana-Champaign****DEPARTMENT OF BIOENGINEERING**

1304 W. Springfield Avenue  
Room 1270 Digital Computer Laboratory  
Urbana, IL 61801  
P 217-333-1867  
E [bioen@illinois.edu](mailto:bioen@illinois.edu)  
W [www.bioen.illinois.edu](http://www.bioen.illinois.edu)

The Department of Bioengineering at the University of Illinois at Urbana-Champaign offers B.S., M.S., and Ph.D. programs, and participates in the Medical Scholars Program that offers combined M.D./Ph.D. degrees. There are 10 Department faculty and 55 affiliate faculty from the Colleges of Engineering, Medicine, Veterinary Medicine, Liberal Arts and Sciences, and Applied Health Sciences. We offer students research opportunities in the area of biomedical imaging, bionanotechnology, cellular engineering, computational biology, informatics and synthetic biology. Visit our exhibit to learn about unique campus resources, research institutes, training grant fellowships, and other educational opportunities.

BOOTH # 618

**University of Kansas****BIOENGINEERING GRADUATE PROGRAM**

1520 West 15th Street, Room 1  
Lawrence, KS 66045  
P 785-864-5258  
E [bioe@ku.edu](mailto:bioe@ku.edu)  
W <http://bio.engr.ku.edu>

KU Bioengineering offers M.S. and Ph.D., and coordinating with KU School of Medicine, the M.D./Ph.D. KU Bioengineering provides breadth in engineering and biological sciences, and depth in a particular research area chosen from six tracks: Bioimaging, Bioinformatics, Biomolecular, Biomedical Product Design & Development, Biomechanics & Neural, and Biomaterials & Tissue.

BOOTH # 408

**University of Maryland****FISCHELL DEPARTMENT OF BIOENGINEERING**

Room 2330  
Jeong H. Kim Engineering Building (Bldg. #225) College Park, MD 20742  
P 301-405-7771  
E [shuskamp@umd.edu](mailto:shuskamp@umd.edu)  
W <http://www.bioe.umd.edu>

The Fischell Department of Bioengineering is the home of an emerging academic discipline, exciting degree programs and students who want to make a difference in human health care through education, research and invention. Our programs serve a community that in many universities comprises two departments: biological engineering and biomedical engineering. Our program centers on the cell, subcellular systems, and systems of cells. We integrate engineering and the life sciences in building a quantitative systems approach for the development of tools and techniques that will serve the molecular underpinnings of health care envisioned for the next generation. The Fischell Department of Bioengineering offers undergraduate and graduate educational programs leading to B.S., E.N.P.M., M.S./M.D. and Ph.D. degrees.

BOOTH # 520

**University of Memphis****UNIVERSITY OF TENNESSEE HEALTH SCIENCES CENTER**

330 Eng. Tech. Bldg., Heaps College, University of Memphis  
Memphis, TN 38152  
P 901-678-3733  
E [eckstein@memphis.edu](mailto:eckstein@memphis.edu)  
W [www.memphis.edu/bme](http://www.memphis.edu/bme)

The UM/UT Joint Graduate Program offers M.S. and Ph.D. degrees in biomedical engineering with research specialization in biomaterials, tissue engineering, drug delivery, biomechanics, biomedical sensors, electrophysiology, and bioimaging. Emphasis in these disciplines is in dental/orthopedics, computational models (pulmonary, coronary, and musculoskeletal), sensor nano/microfabrication, and image processing and analyses.

BOOTH # 400

**University of Michigan****BIOMEDICAL ENGINEERING DEPARTMENT**

1107 Carl A. Gerstacker Building  
2200 Bonisteel Blvd.  
Ann Arbor, MI 48109-2099  
P 734-647-1422  
E [mbdon@umich.edu](mailto:mbdon@umich.edu)  
W [www.bme.umich.edu](http://www.bme.umich.edu)

The University of Michigan Biomedical Engineering Department provides outstanding education for engineers in biomedical engineering and develops future leaders in the field. The program's primary emphasis is on biomedical engineering fundamentals, while allowing students to personalize their curriculum to prepare them for a wide variety of careers including biomedical engineering, law, medicine, and business.

## BOOTH # 606

**University of Minnesota**

## DEPARTMENT OF BIOMEDICAL ENGINEERING

312 Church St. SE  
7-105 Nils Hasselmo Hall  
Minneapolis, MN 55455  
P 612-624-8396  
E [bmengp@umn.edu](mailto:bmengp@umn.edu)  
W [www.umn.edu/bme](http://www.umn.edu/bme)

The Department of Biomedical Engineering at the University of Minnesota offers an established graduate program (since 1972) located at the intersection of the medical school, engineering, and physical sciences, in the heart of Medical Alley. Research conducted by the faculty spans the full spectrum, with thrusts in cardiovascular/neural engineering, cell/tissue engineering, and biomedical imaging/optics.

## BOOTH # 415

**University of Missouri**

## BIODESIGN &amp; INNOVATION PROGRAM

115 Business Loop 70 West  
Room 421  
Columbia, MO 65203  
P 573-884-2058  
E [jahnsenm@health.missouri.edu](mailto:jahnsenm@health.missouri.edu)  
W [www.mubiodesign.com](http://www.mubiodesign.com)

The Biodesign & Innovation Fellowship is for engineers who have interest in a career developing new medical technologies. The engineer fellow works with a physician and business fellow. The team identifies clinical needs, develops solutions for the needs and filters the solutions for a final product to focus on for the remaining year.

## BOOTH # 402

**University of Pittsburgh**

## CENTER FOR BIOTECHNOLOGY

300 Technology Drive  
Pittsburgh, PA 15219  
P 412-624-6445  
E [lspataro@pitt.edu](mailto:lspataro@pitt.edu)  
W [www.pitt.edu/bioengineering/main/](http://www.pitt.edu/bioengineering/main/)

The University of Pittsburgh, Department of Bioengineering display includes materials related to undergraduate and graduate educational programs and fellowship opportunities along with examples of faculty research programs.

## BOOTH # 115

**University of Rochester**

209 Robert E. Georgen Hall  
Rochester, NY 14627  
P 585-275-0453  
E [hurlbutt@bme.rochester.edu](mailto:hurlbutt@bme.rochester.edu)  
W [www.urmc.rochester.edu/bme](http://www.urmc.rochester.edu/bme)

The Graduate Program in the Department of Biomedical Engineering at the University of Rochester has been designed to emphasize the application of engineering skills to biomedical problem solving at the Masters and Doctoral level. Research in the department covers a broad spectrum, ranging in length scale from molecular to whole animal, and encompassing a wide variety of physiological systems and experimental approaches. Primary faculty members typically collaborate with faculty in other established centers and areas of strength at the University. With access to over 50 laboratories on the River Campus, Medical Center, and Strong Memorial Hospital, students can tailor their own interdisciplinary training experience. Multiple active centers and affiliated groups offer collaborative research in the five general research areas: Biomedical Optics; Neuroengineering; Biomechanics; Medical Imaging; and Cell & Tissue Engineering.

## BOOTH # 406

**University of Texas at Arlington****Joint Program with Southwestern Medical Center at Dallas**

## DEPARTMENT OF BIOENGINEERING

501 West First Street, ELR 233  
Arlington, TX 76019  
P 817-272-2249  
E [Bradfield@exchanging.uta.edu](mailto:Bradfield@exchanging.uta.edu)  
W [www.uta.edu/bioengineering/index.php](http://www.uta.edu/bioengineering/index.php)

The Bioengineering Department at the University of Texas Arlington offers joint graduate degrees with The University of Texas Southwestern Medical Center at Dallas with many research opportunities in Bioinstrumentation, Biomaterials & Tissue Engineering, Biomechanics & Orthopedics, Medical Imaging, and Protein Engineering. Please visit our booth to learn more.

## BOOTHS # 312/314

**The University of Texas at Austin**

## DEPARTMENT OF BIOMEDICAL ENGINEERING

1 University Station, C0800  
Austin, TX 78712  
P 512-475-8623  
E [sbixby@mail.utexas.edu](mailto:sbixby@mail.utexas.edu)  
W [www.bme.utexas.edu](http://www.bme.utexas.edu)

With an accomplished faculty and diverse student body, The University of Texas at Austin's Biomedical Engineering Graduate Program offers opportunities for scholars to build interdisciplinary knowledge in research areas such as cellular and molecular imaging, cellular and biomolecular engineering, and computational biomedical engineering and bioinformatics.

BOOTH # 121

**The University of Texas at Dallas**

800 West Campbell  
 Dallas, TX 75080  
 P 972-883-4679  
 E m.vidyasagar@utdallas.edu  
 W www.ecs.utdallas.edu/bioengineering

The University of Texas at Dallas offers M.S. and Ph.D. degrees in Biomedical Engineering, in collaboration with the UT Southwestern Medical Center and UT Arlington. Specializations include: Devices and materials, computational biology, and medical imaging.

BOOTH # 612

**University of Texas at San Antonio**

One UTSA Circle, AET 1.102  
 San Antonio, TX 78249  
 P 210-458-5535  
 E margaret.bullosa@utsa.edu  
 W http://engineering.utsa.edu/bme/bme\_program

The University of Texas at San Antonio and The University of Texas Health Science Center at San Antonio (UTSA/UTHSCSA) jointly offer graduate degrees in Biomedical Engineering. The Joint Program is designed to train students for careers at the forefront of biomedical engineering. Visit us at Exhibit Booth 612 and see what San Antonio has to offer!

BOOTH # 620

**University of Washington**

**DEPARTMENT OF BIOENGINEERING**  
 3720 15th Avenue NE, Box 355061  
 Seattle, WA 98103  
 P 206-685-2000  
 E bioeng@uw.edu  
 W http://depts.washington.edu/bioe/index.html

Our department aims to serve a worldwide leadership role in bioengineering research, education, service, clinical applications, and technology transfer. Prospective graduate students, postdoctoral fellows, and faculty candidates are encouraged to hear, from faculty and students, about employment, research, and educational opportunities in the department. Informational brochures and memorabilia are also available.

BOOTH # 203

**Vanderbilt University****DEPARTMENT OF BIOMEDICAL ENGINEERING**

5824 Stevenson Center  
 VU Station 35-1631  
 Nashville, TN 37235  
 P 615-322-3521  
 E bme-info@vanderbilt.edu  
 W http://engineering.vanderbilt.edu/BiomedicalEngineering.aspx

VU BME exists at both the scientific and geographic intersection of Vanderbilt's engineering and basic science departments and its renowned medical center, providing an ideal location for engineering research at the interface of technology and medicine. Research strengths exist in image-based technologies, nanobiotechnology and biophotonics and are complemented by other core competencies, including modeling and forecasting, biomaterials and bioregenerative engineering, bioMEMS, multiscale systems biology and the capacity for translation of research into practice. A comprehensive and highly integrated program of graduate education, including a unique first year curriculum, rapidly prepares graduate students for success in research.

BOOTHS # 600/602

**Virginia Tech-Wake Forest University****SCHOOL OF BIOMEDICAL ENGINEERING & SCIENCE**

VT-WFU SBES:  
 319 ICTAS, Stanger Street MC0298  
 Virginia Polytechnic Institute & State University Blacksburg, VA 24061  
 P 540-231-8191  
 E pamstiff@vt.edu  
 W http://www.sbes.vt.edu

The Virginia Tech – Wake Forest University, School for Biomedical Engineering and Sciences offers MS, PhD, MD/PhD, and DVM/PhD degrees. We have 51 biomedical engineering faculty with active research programs in tissue engineering, imaging, biomechanics, medical physics, nano-medicine, surgical simulation, and other emerging fields.

BOOTH # 300

**Washington University - St. Louis****DEPARTMENT OF BIOMEDICAL ENGINEERING**

One Brookings Drive, Box 1097  
 St. Louis, MO 63130  
 P 314-935-6164  
 E teasdalek@wustl.edu  
 W http://bme.wustl.edu/

In partnership with our world-class medical school, our department emphasizes interdisciplinary, multi-scale training with a medical focus from top-notch faculty. Our main research areas are biomaterials and tissue engineering; cardiovascular engineering; imaging; molecular, cell and systems engineering; and neural engineering. We offer BS, MS, MS/MBA, PhD and MD/PhD degrees.

BOOTH # 500

## Wayne State University

### BIOMEDICAL ENGINEERING

818 W. Hancock  
Detroit, MI 48201  
P 313-577-1345  
E [bme@eng.wayne.edu](mailto:bme@eng.wayne.edu)  
W [www.bme.wayne.edu](http://www.bme.wayne.edu)

The Biomedical Engineering Department at Wayne State University offers BS, MS, PhD and MD/PhD degrees. It is involved in some of the newest ground breaking research in the field. From the use of biomaterials to aid in the regeneration of nerves and the tailoring of these materials to optimize cellular response, to the use of advanced human modeling to study the biomechanics of impact injuries, and the study of sports related injuries and prevention of these injuries, Wayne State will play a major role in the development of new standards to better the quality of human life. Our past research has led to improvement in the standards of the automotive industry, better safer equipment for our soldiers, and a better understanding of injury biomechanics to help prevent and repair damage from these injuries.

BOOTH # 224

## Wells Fargo Insurance Services

1401 H Street NW, Suite 750  
Washington, DC 20005  
P 202-772-4197  
E [ashley.walley@wellsfargo.com](mailto:ashley.walley@wellsfargo.com)  
W [wellsfargo.com/wfis](http://wellsfargo.com/wfis)

Wells Fargo partners with BMES to bring its members valued added and discounted products and services including Smart Savings (discounted products), Health, Life and Long Term Care insurances as well as Auto, Homeowners, Legal, Pet, Cancer and Accident insurances.

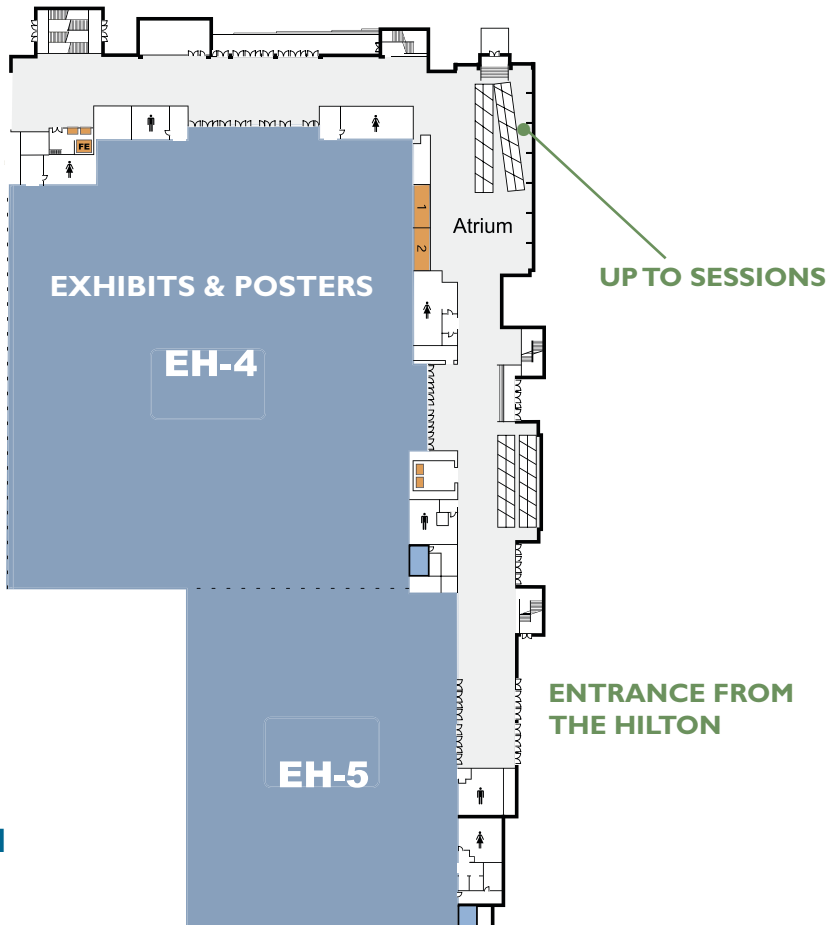
BOOTH # 428

## World Precision Instruments, Inc.

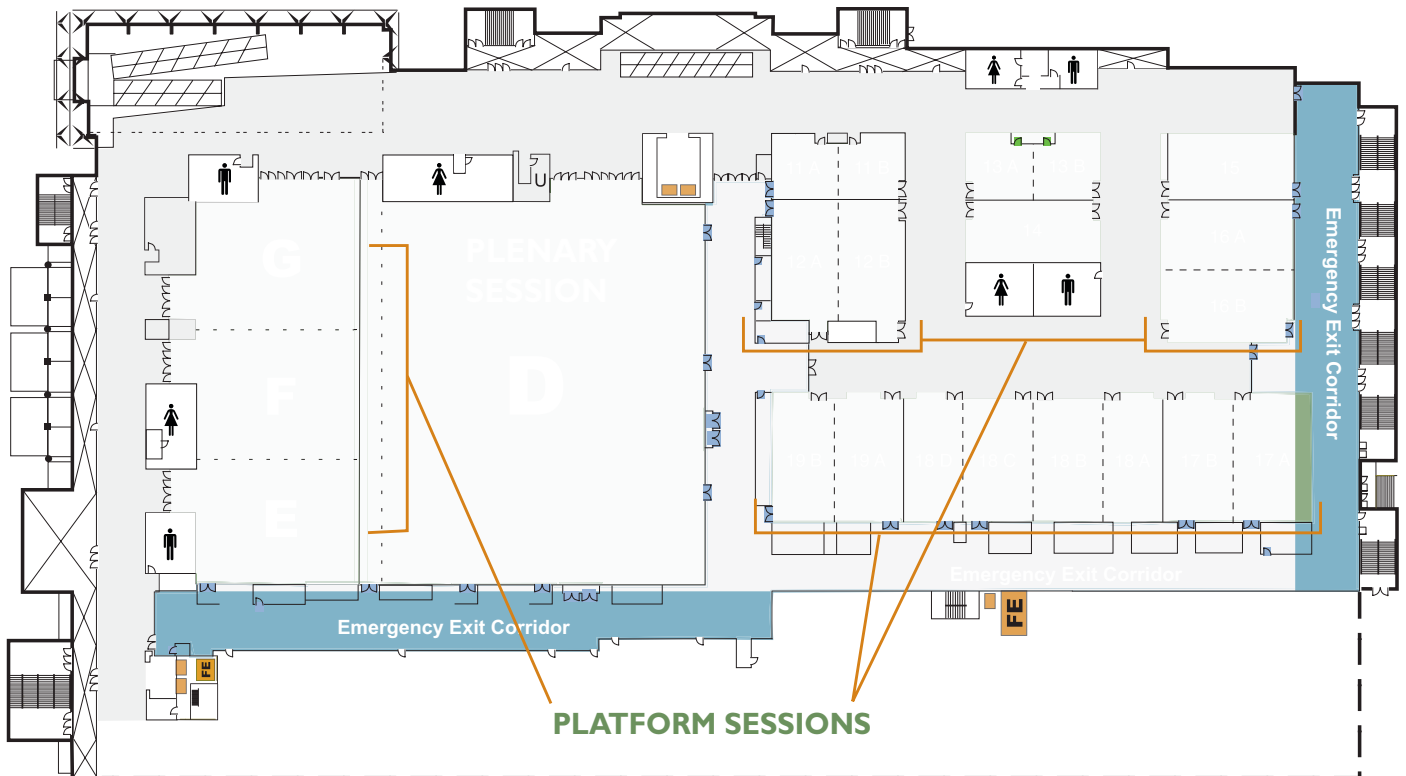
175 Sarasota Center Boulevard  
Sarasota, FL 34240  
P 941-371-1003  
E [am@wpiinc.com](mailto:am@wpiinc.com)  
W [www.wpiinc.com](http://www.wpiinc.com)

## Austin Convention Center

500 East Cesar Chavez Street  
Austin, TX 78701  
512-404-4000



## LEVEL 4 GRAND BALLROOM AND MEETING ROOMS

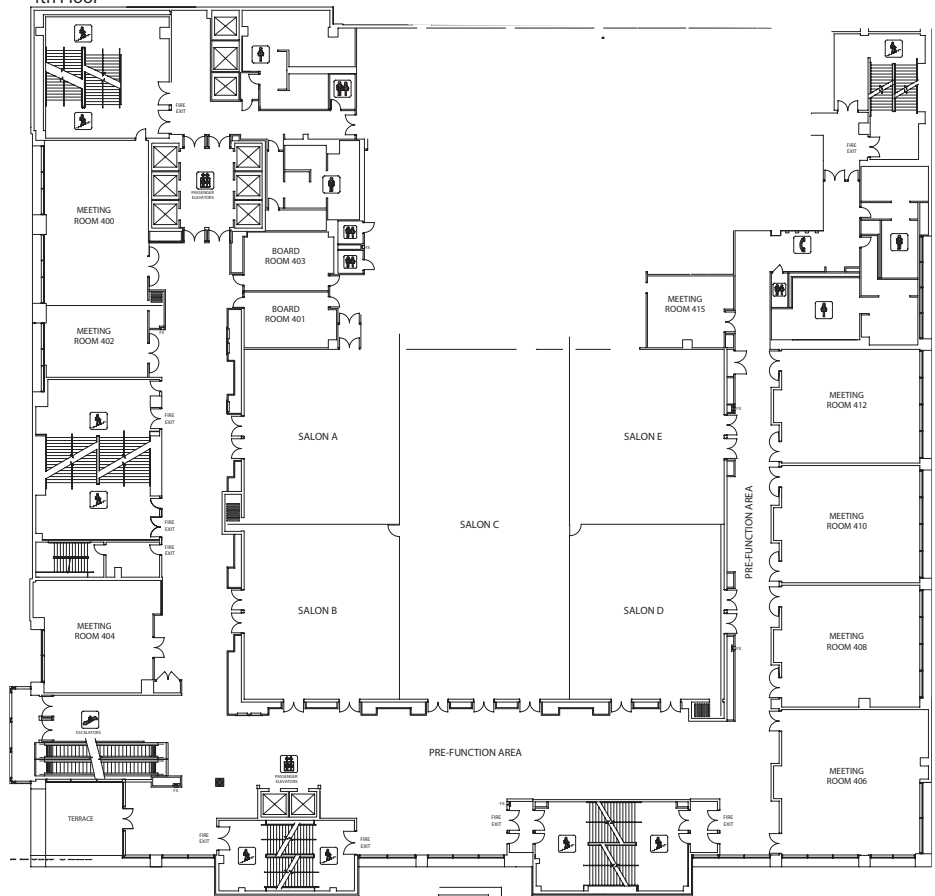


# HILTON AUSTIN

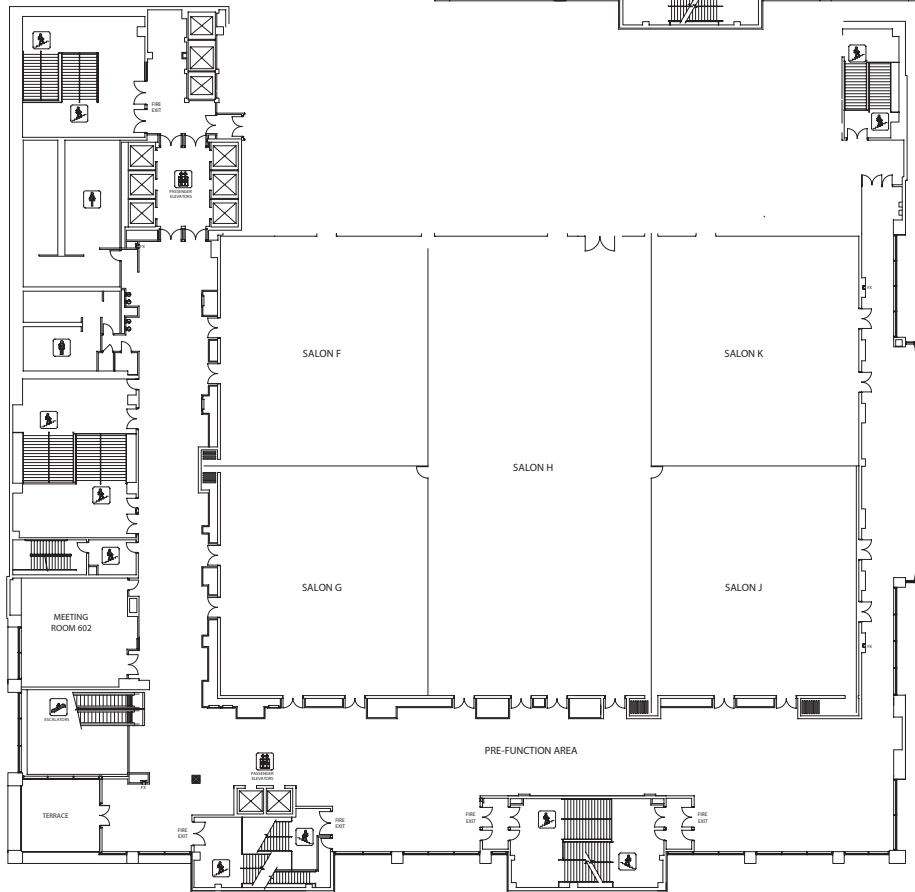
## Hilton Austin

500 East 4th Street  
Austin, Texas 78701  
512-482-8000

4th Floor



6th Floor



# PROGRAM AT-A-GLANCE

2010 | OCTOBER 7 | THURSDAY

Track	10:30am - 12:00noon	1:30pm - 3:00pm	4:00pm - 5:30pm
Biomedical Engineering Education		<b>Cardiovascular Devices – II</b> Room 406	
Biomedical Imaging and Optics	<b>Molecular Imaging I – New Approaches and Technologies</b> Room 12B <b>Imaging in Cancer Using Nanotechnology - I</b> Room 19A	<b>Molecular Imaging II – Synthesis and In Vitro Imaging</b> Room 12B <b>Imaging in Cancer Using Nanotechnology - II</b> Room 19A	<b>Optical and Ultrasound Imaging of Cancer</b> Room 12B <b>CV Imaging</b> Room 19A
Cardiovascular Engineering	<b>Innovations in Cardiovascular Bioengineering I: Cardiac</b> Room 18C <b>Cardiovascular Fluid Dynamics – I</b> Room 18D	<b>Cardiac Electrophysiology</b> Room 18C <b>Cardiovascular Fluid Dynamics – II</b> Room 18D <b>Cardiovascular Tissue Engineering - I</b> Ballroom F	<b>Innovations in Cardiovascular Bioengineering II: Vascular</b> Room 18C <b>Microvasculature, Angiogenesis, and Capillary Patches</b> Room 18D
Cellular and Molecular Engineering	<b>Cellular and Subcellular Imaging</b> Room 18A <b>Cell Adhesion - I</b> Room 18B	<b>Molecular Engineering - I</b> Room 18A <b>Cell Mechanics</b> Room 18B	<b>Molecular Engineering – II</b> Room 18A <b>Mechanotransduction – I</b> Room 18B <b>Acta Biomaterialia Gold Medal Award Session</b> Ballroom G
Devices: Nano to Micro	<b>Biomems and Nanotech for Cellular Engineering</b> Room 16B	<b>Medical Diagnostics: Nano to Micro Devices – I</b> Room 16A <b>Nano to Micro: Fluidic Technologies – I</b> Room 16B	<b>Medical Diagnostics: Nano to Micro Devices – II</b> Room 16A <b>Nano to Micro: Fluidic Technologies – II</b> Room 16B
Drug Delivery and Intelligent Systems	<b>Nucleic Acid Delivery - I</b> Room 14	<b>Nucleic Acid Delivery - II</b> Room 14	<b>Acta Biomaterialia Gold Medal Award Session</b> Ballroom G
Orthopedic and Rehabilitation Engineering	<b>Orthopedic Bioengineering &amp; Imaging</b> Room 17A	<b>Orthopedic Biomaterials</b> Room 17A	<b>Musculoskeletal Cell Mechanotransduction</b> Room 17A
New Frontiers in Bioengineering	<b>Immunobioengineering – I</b> Room 15	<b>Biological Engineering in Cancer</b> Room 15	<b>Synthetic Biology in Health and Medicine</b> Room 15
Neural Engineering	<b>Brain-Computer Interfaces</b> Room 19B <b>Neural Tissue Engineering – I</b> Ballroom F	<b>Motor Neural Prosthetics</b> Room 19B	<b>Engineering the Neural Environment</b> Room 19B
Respiratory Engineering			<b>Complex and Multiscale Behavior in the Lung</b> Room 12A
Systems Biology, Bioinformatics and Computational Biology	<b>High-throughput Computational Biology</b> Room 17B	<b>Signals and Networks in Cancer and Disease - I</b> Room 17B	<b>Molecular and Cellular Design and Evolution</b> Room 17B
Tissue Engineering	<b>Novel Biomaterials and Scaffolds – I</b> Room 12A <b>Nano- and Micro-Engineering in Tissue Engineering – I</b> Ballroom E <b>Neural Tissue Engineering – I</b> Ballroom F <b>Musculoskeletal Tissue Engineering – I</b> Ballroom G	<b>Novel Biomaterials and Scaffolds - II</b> Room 12A <b>Nano- and Micro-Engineering in Tissue Engineering - II</b> Ballroom E <b>Cardiovascular Tissue Engineering - I</b> Ballroom F <b>Musculoskeletal Tissue Engineering – II</b> Ballroom G	<b>Printing and Patterning in Tissue Engineering</b> Ballroom F <b>Acta Biomaterialia Gold Medal Award Session</b> Ballroom G
Other	<b>AIMBE Session</b> , Room 16A <b>Whitaker International Fellows and Scholars Program</b> Hilton, Room 602		<b>Acta Biomaterialia Gold Medal Award Session</b> Ballroom G

Track	10:30am - 12:00noon	1:30pm - 3:00pm
Biomedical Engineering Education		<b>Global Health</b> Room 18A
Biomedical Imaging and Optics	<b>Neuroimaging</b> Room 12B <b>Imaging in Therapeutics - I</b> Room 19A	<b>Imaging in Therapeutics - II</b> Room 12B <b>Biophotonics - I</b> Room 19A
Cardiovascular Engineering	<b>Vascular Permeability</b> Room 18C <b>Heart Valve I: Mechanobiology and Pathology</b> Room 18D	<b>Vascular Structure and Function I: Pathology</b> Room 18C <b>Cardiovascular Computational Modeling and Measurement - I</b> Room 18D <b>Cardiovascular Tissue Engineering - II</b> Ballroom F
Cellular and Molecular Engineering	<b>Cellular Engineering and Modeling</b> Room 18A <b>Cell-Cell Interactions</b> Room 18	<b>Cell Adhesion - II</b> Room 18B
Devices: Nano to Microg	<b>Medical Diagnostics: Nano to Micro Devices – III</b> Room 16A <b>Nano to Micro: Fluidic Technologies – III</b> Room 16B	<b>Drug Delivery Technologies: Nano to Micro Devices - I</b> Room 16A <b>Micro and Nanostructured Biomaterials – I</b> Room 16B
Drug Delivery and Intelligent Systems	<b>Novel Materials &amp; Self-Assembling Systems</b> Room 14 <b>Translational Drug Delivery</b> Room 15	<b>Novel Materials &amp; Self-Assembling Systems: Cancer Applications</b> Room 14
Orthopedic and Rehabilitation Engineering		<b>Rehabilitation Engineering</b> Room 17B
New Frontiers in Bioengineering		<b>Immunobioengineering - II</b> Room 15
Neural Engineering	<b>Neural Modeling</b> Room 19B <b>Neural Tissue Engineering - II</b> Ballroom G	<b>Sensory Neural Prosthetics</b> Room 19B
Respiratory Engineering	<b>Microfluidics and Tissue Engineering Constructs for the Lung</b> Room 17A	<b>Imaging the Lung – The New Frontier</b> Room 17A
Systems Biology, Bioinformatics and Computational Biology	<b>Multiscale Modeling</b> Room 17B	
Tissue Engineering	<b>Cell-Biomaterial Interfaces</b> Room 12A <b>Engineered Tissue Models of Disease</b> Ballroom F <b>Neural Tissue Engineering - II</b> Ballroom G	<b>Cardiovascular Tissue Engineering - II</b> Ballroom F <b>Engineered Tissue Models for Drug Discovery</b> Ballroom G
Translational Biomedical Engineering		<b>Translational Biomedical Engineering</b> Room 12A



# PROGRAM AT-A-GLANCE

2010 | OCTOBER 10 | SATURDAY

Track	10:30am - 12:00noon	1:30pm - 3:00pm	3:30pm - 5:30pm
Biomedical Engineering Education		<b>Teaching Tools and Strategies</b> Room 18A	<b>Learning Modules and Instructional Materials</b> Room 18A
Biomedical Imaging and Optics	<b>Biophotonics – II</b> Room 19A	<b>Biophotonics – III</b> Room 19A	<b>Imaging Hardware and Software</b> Room 19A
Cardiovascular Engineering	<b>Vascular Structure and Function II: Growth and Remodeling</b> Room 18C <b>Cardiovascular Computational Modeling and Measurement – II</b> Room 18D	<b>Cardiac Stents and Arterial Devices</b> Room 18C <b>Vascular Mechano-signal Transduction</b> Room 18D <b>Cardiovascular Tissue Engineering - III</b> Ballroom F	<b>Heart Valve Biomechanics II: Mechanics and Simulation</b> Room 18C <b>Thrombosis and Hemostasis</b> Room 18D
Cellular and Molecular Engineering	<b>Molecular Engineering – III</b> Room 18A <b>Cell Motility</b> Room 18B	<b>Mechanotransduction – II</b> Room 18B	<b>The Physics and Engineering of Cancer Cells and Their Microenvironment</b> Room 18B <b>Cellular and Subcellular Mechanics</b> Room 15
Devices: Nano to Micro	<b>Drug Delivery Technologies: Nano to Micro Devices – II</b> Room 16A <b>Micro and Nanostructured Biomaterials – II</b> Room 16B	<b>Biosensors, Bio-Interfaces and Implantable Devices – I</b> Room 16A <b>Emerging Concept of Medical Micro Devices</b> Room 16B	<b>Biosensors, Bio-Interfaces and Implantable Devices – II</b> Room 16A
Drug Delivery and Intelligent Systems	<b>Drug Delivery Technologies: Nano to Micro Devices – II</b> Room 16A <b>Micro and Nanostructured Biomaterials – II</b> Room 16B	<b>Targeted Drug Delivery – II</b> Room 14	<b>Targeted Drug Delivery – III</b> Room 14
Orthopedic and Rehabilitation Engineering	<b>Orthopedic Soft Tissue Biomechanics</b> Room 17B	<b>Orthopedic Hard Tissue Biomechanics</b> Room 17B	<b>Skeletal Biomechanics</b> Room 17B
New Frontiers in Bioengineering		<b>Integrated Cellular Systems</b> Room 15	<b>Systems – Level Approaches in Bioengineering</b> Room 16B <b>Cellular and Subcellular Mechanics</b> Room 15
Neural Engineering	<b>Neural Control of Movement</b> Room 19B	<b>Neural Engineering Technology</b> Room 19B	<b>Neural Electrode Tissue Interface</b> Room 19B
Respiratory Engineering	<b>Acute Lung Injury from Cell to System</b> Room 17A	<b>Mechanobiology in the Lung</b> Room 17A	<b>Lung Computational Fluid Dynamics and Particle Deposition</b> Room 17A
Systems Biology, Bioinformatics and Computational Biology	<b>Modeling of Biomolecules and Their Interactions</b> Room 12B	<b>Signals and Networks in Cancer and Disease – II</b> Room 12B	<b>Systems Cell Biology</b> Room 12B
Tissue Engineering	<b>Stem Cells and Tissue Engineering – I</b> Ballroom E <b>Host Response to Biomaterials</b> Ballroom F <b>Cell- and Gene-Based Therapeutics</b> Ballroom G	<b>Novel Biomaterials and Scaffolds – IV</b> Room 12A <b>Stem Cells and Tissue Engineering – II</b> Ballroom E <b>Cardiovascular Tissue Engineering – III</b> Ballroom F <b>Bioreactors and Bioprocessing in Tissue Engineering</b> Ballroom G	<b>Novel Biomaterials and Scaffolds – V</b> Room 12A <b>Stem Cells and Tissue Engineering – III</b> Ballroom E <b>Controlled Release in Tissue Engineering</b> Ballroom F <b>Bioinspired Materials</b> Ballroom G
Translational Biomedical Engineering	<b>Novel Biomaterials and Scaffolds – III</b> Room 12A		
Undergraduate	<b>Undergraduate Research I</b> Room 13B	<b>Undergraduate Research II</b> Room 13B	



# SCHEDULE AT-A-GLANCE

2010 | OCTOBER 7 | THURSDAY

Thursday October 7, 2010	7am	8am	9am	10am	11am	12pm	1pm	2pm	3pm	4pm	5pm	6pm	7pm	8pm	9pm	10pm
<b>Plenary Session</b> <i>Pritzker Distinguished Lecturer</i> Convention Center, Ballroom D <i>see page 9 for details</i>		8:00am – 9:30pm														
<b>Exhibit Hall Open</b> Convention Center, Hall 4			9:30am - 5:00pm													
<b>Poster Sessions</b> Convention Center, Hall 4 <i>pages 32-44, and 51-62 for details</i>			Session 7A 9:30am - 1:00pm				Session 7B 1:30pm - 5:00pm									
<b>Platform Sessions</b> Convention Center <i>17 concurrent sessions pages 45-50, 63-68 and 69-73</i>				Platform 7-1 10:30am - 12:00pm			Platform 7-2 1:30pm - 3:00pm			Platform 7-3 4:00pm - 5:30pm						
<b>Scheduled Breaks</b>			9:30am - 10:30am			Lunch (on own) 12:00pm - 1:30pm			3:00pm - 4:00pm							
<b>Celebration of Minorities in BME Luncheon</b> <i>Additional ticket purchase required</i> Hilton, Salon G						12noon – 1:30pm										
<b>Career Alumni Panel</b> Convention Center										4:00pm - 5:30pm						
<b>Resume Review/ Writing Workshop</b> Convention Center											5:45pm – 7:15pm					
<b>BMES Business Meeting &amp; Award Ceremony</b> Convention Center, Ballroom D											5:45pm – 7:15pm					
<b>Welcome Reception</b> Hilton, Salon JK													7:30pm – 8:30pm			
<b>University Receptions</b> <i>Invitation Only</i> Hilton - see page ?														8:00pm - 9:30pm		

**Registration**  
Convention Center, Hall 4  
7:00am – 6:00pm

**Speaker Ready Room**  
Room 13A

**Whitaker International Fellows and Scholars Program**

Hilton, 602  
10:30am – 12:00pm

**CVET Editorial Board Lunch**

*Invitation Only*  
Marriott Downtown Courtyard  
12:00pm - 1:30pm

**BMES National Meetings Committee Luncheon**

Convention Center  
Room 13B  
12:00noon – 1:30pm

**AEMB Annual Grand Meeting**

Hilton, 602  
1:00PM - 3:00PM

**AIMBE Industry Tech Transfer Meeting**

*Invitation Only*  
Hilton, 401  
1:30PM - 4:30PM

**ABME Editorial Board Dinner**

*Invitation Only*  
Marriott Downtown Courtyard  
7:30pm - 10:00pm

# SCHEDULE AT-A-GLANCE

	7am	8am	9am	10am	11am	12pm	1pm	2pm	3pm	4pm	5pm	6pm	7pm	8pm	9pm	10pm
<b>Friday</b> <b>October 8, 2010</b>																
<b>Plenary Session</b> <i>BMES Distinguished Achievement Lecturer Award</i> Convention Center, Ballroom D		8:30am - 9:30am														
<b>Exhibit Hall Open</b> Convention Center, Hall 4 9:30am - 1:00pm			9:30am - 5:00pm													
<b>Poster Sessions</b> Convention Center, Hall 4 <i>pages 74-85 and 91-102 for details</i>			Session 8A 9:30am - 1:00pm				Session 8B 1:30pm - 5:00pm									
<b>Platform Sessions</b> <i>16 concurrent sessions</i> Convention Center <i>pages 86-90, 103-107 for details</i>				Platform 8-1 10:30am - 12:00pm			Platform 8-2 1:30pm - 3:00pm									
<b>Scheduled Breaks</b> Convention Center, Hall 4			9:30am - 10:30am			Lunch (on own) 12:00pm - 1:30pm			3:00pm - 4:00pm							
<b>BMES Student Chapter Development Workshop</b> Convention Center, Ballroom E				10:30am - 11:30am				1:30pm - 2:30pm								
<b>BMES Student Leader Workshop</b> Convention Center, Ballroom E																
<b>Women in BMES Presentation &amp; Luncheon</b> <i>Additional ticket purchase required</i> Hilton, Salon AB						12:00pm - 1:30pm										
<b>Career Fair</b> Convention Center, Hall 4							1:00pm - 4:00pm									
<b>Distinguished Speakers Plenary Session</b> <i>Future Frontiers of Biomedical Engineering</i> Convention Center, Ballroom D										4:00pm - 6:00pm						
<b>Special Event</b> Bullock Museum												6:30pm - 9:30pm				

<b>Registration</b> Convention Center, Hall 4 7:00am - 6:00pm	<b>AEMB Annual Ethics Session</b> Hilton, 602 10:00am - 11:00am	<b>AIBME Academic Council Meeting</b> Hilton, 406 10:00am - 12:00pm	<b>CMBE Editorial Board Lunch</b> <i>Invitation Only</i> Marriott Downtown Courtyard 12:00pm - 1:30pm	<b>2011 BMES Annual Meeting Committee Meeting</b> 9:30am - 11:00am Convention Center, Room 13B	<b>AEMB Public Policy Forum</b> Hilton, 602 2:30pm - 3:30pm
<b>Speaker Ready Room</b> Room 13A					

# SCHEDULE AT-A-GLANCE

2010 | OCTOBER 9 | SATURDAY

	7am	8am	9am	10am	11am	12pm	1pm	2pm	3pm	4pm	5pm	6pm	7pm	8pm	9pm	10pm
<b>Saturday, October 9, 2010</b> <b>Plenary Session</b> <i>Rita Schaffer Young Investigator Lecture</i> Diversity Award Winner Convention Center, Ballroom D		8:00am – 9:30am														
<b>Exhibit Hall Open</b> Convention Center, Hall 4 9:30am – 1:00pm			9:30am – 1:30pm													
<b>Poster Session</b> Convention Center, Hall 4 <i>see pages 108-117, and 118-125 for details</i>			Session 9A 9:30am - 1:00pm													
<b>Platform Sessions</b> Convention Center, Hall 4 <i>18 concurrent sessions see pages 125-131, 132-137 and 138-143 for details</i>				Platform 9-1 10:30am - 12:00pm			Platform 9-2 1:30pm - 3:00pm		Platform 9-3 3:15pm - 4:45pm							
<b>Scheduled Breaks</b>			9:30 am - 10:30am			Lunch (on own) 12:00pm - 1:30pm										

**Registration**  
 Convention Center, Hall 4  
 7:00am – 2:00pm

**Speaker Ready Room**  
 Room 13A

**BMES Board of Directors Meeting**  
 Hilton, Salon AB  
 10:00am – 2:30pm





