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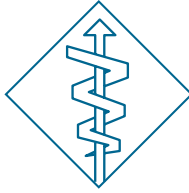
BIOMEDICAL ENGINEERING SOCIETY
Advancing Human Health and Well Being

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

Hartford, Connecticut

Thomas Webster, Chair
Host: Brown University

October 24-27, 2012

Atlanta, Georgia

Hanjoong Jo, Chair
Host: Georgia Institute of Technology & Emory University

September 25-28, 2013

Seattle, Washington

October 22-25, 2014

San Antonio, Texas

October 7-10, 2015

Tampa, Florida

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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*

WELCOME 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

THE 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

WELCOMETO 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

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Krishnendu Roy
University of Texas, Austin

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Texas Medical Center

Stanislav Emelianov
University of Texas, Austin

James Tunnell
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University of Texas, Austin

Student Program Chair

Mia Markey
University of Texas, Austin

Student Volunteers Chair

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. **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.

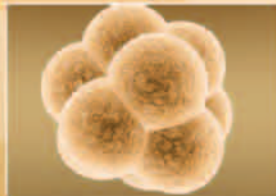
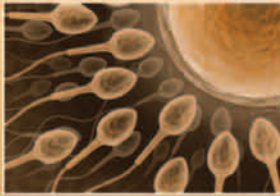
She was named a Howard Hughes Medical Institute Professor in 2002 and 2006, and was elected to the US National Academy of Engineering (2008). She was elected fellow of AAAS and of BMES in 2008, and received the IEEE Educational Activities Board Vice-President Recognition Award (2008).

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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For more information about the Prize and Grants, visit: www.foundanimals.org

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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

DURING 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

Sponsored by University of Texas, Austin



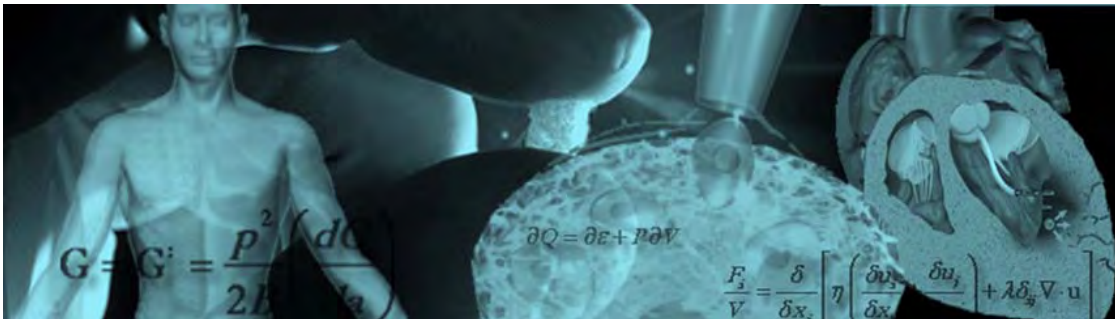
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Step into the future



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

THE 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

THE 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.**

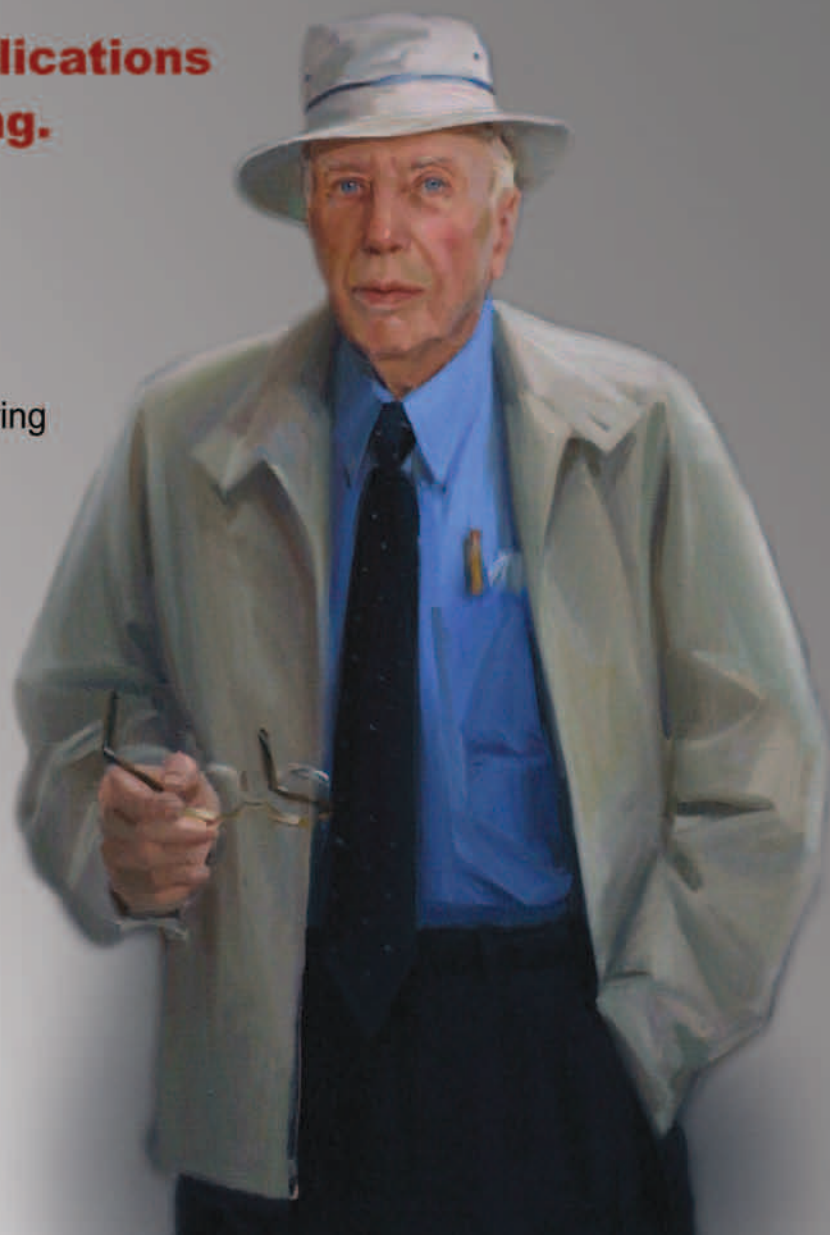
Qualifications include:

- 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.



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

Info, Jimmy Moore

jmoorej@bme.tamu.edu

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

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 Guldberg
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
Jonathan Butcher
Kevin Costa
John Criscione
Daniel Einstein
Jennifer Elisseeff
George Engelmayr
Ender Finol
John Frangos
Keith Gooch
Jane Grande-Allen
Mariah Hahn
Dan Hammer
Hai-Chao Han
Zhaoming He
Jeff Holmes
Jeffrey Jacot
Roy Kerckhoffs
Karyn Kunzelman
Jun Liao
Keefe Manning
Laura Marcu
Kristyn Masters
Karen May-Newman
Larry McIntire
W. David Merryman
Mohammad Mofrad
James Moore
Sriram Neelamegham
Anthony Passerini
Abhijit Patwardhan
Shayn Peirce-Cottler
Amina Qutub
Buddy Ratner
Cynthia Reinhart-King
Kristina Ropella
Michael Sacks
Frederick Schoen
Alisha Sieminski
Craig Simmons
Marc Simon
Scott Simon
David Steinman
Wei Sun
John Tarbell
Joe Tien
Nikolaos Tsoukias
Sarah Vigmstad
James Warnock
Sarah Wells

Cellular and Molecular Engineering

Brian Applegate
Gang Bao
Craig Duvall
Jennifer Elisseeff
Adam Engler
Nathan Gallant
Andres Garcia
Charles Gersbach
Dan Hammer
William Hancock
Julie Ji
Lance Kam
Melissa Kemp
Phil LeDuc
Jerry Lee
J. Christopher Love
Kristen Maitland
Jannifer Maynard
Larry McIntire
Deepak Nagrath
Sriram Neelamegham
Celeste Nelson
David Odde
Buddy Ratner
Cynthia Reinhart-King
Kristina Ropella
Ian Schneider
Laura Segatori
Wei Shen
Alisha Sieminski
Scott Simon
Alexander Spector
Todd Sulchek
Roger Tran-Son-Tay
Maribel Vazquez
Fan Yang
Evan Zamir

Devices: Nano to Micro

Xuanhong Cheng
Paolo Decuzzi
Tejal Desai
Jennifer Elisseeff
Sergej Fatikow
Marc Feldman
David Fozdar
Peter Gascoyne,
Ashwini Gopal
Dan Hammer
Amy Herr
Tony Huang
Yu-Yen Huang
Samir Iqbal
Keith Johnston
Michelle Khine
Sanjay Kumar
Phil LeDuc
Chen-zhong Li

Song Li
 Chang Liu
 John McDevitt
 Larry McIntire
 Ellis Meng
 Sriram Neelamegham
 Tingrui Pan
 Babak Parviz
 Ketul Popat
 Buddy Ratner
 Kristina Ropella
 Shuvo Roy
 Tushar Sharma
 Ronald Siegel
 Scott Simon
 Jack Skinner
 Nitesh Thakor
 Robert Tranquillo
 Christine Trinkle
 James Tunnell
 Sihong Wang
 Zhongling Wang
 Jennifer West
 Huikai Xie
 Xiaojing (John) Zhang
 Xin Zhang

Drug Delivery and Intelligent Systems

Jason Burdick
 Jianjun Cheng
 Michelle Dawson
 Craig Duvall
 Jennifer Elisseeff
 Jordan Green
 Dan Hammer
 Daniel Kamei
 Larry McIntire
 Niren Murthy
 Sriram Neelamegham
 Suzie Pun
 Buddy Ratner
 Kristina Ropella
 Justin Saul
 Anirban Sen Gupta
 Scott Simon
 Junghee Suh
 Horst von Recum

Neural Engineering

Christopher Butson
 Jeffrey Capadona
 Jennifer Elisseeff
 Kenneth Gustafson
 Dan Hammer
 Larry McIntire
 Dan Moran
 Sriram Neelamegham
 Buddy Ratner
 Kristina Ropella
 Shelly Sakiyama-Elbert
 Brian Schmit
 Scott Simon
 Dustin Tyler
 Horst von Recum
 James Weiland
 John White
 Justin Williams
 Patrick Wolf
 Paul Yoo

New Frontiers in Bioengineering

Christopher Anderson
 James Collins
 Jennifer Elisseeff
 George Georgiou
 Dan Hammer
 Vassily Hatzimanikatis
 Jimmy Hsia
 Darrell Irvine
 Roger Kamm
 Larry McIntire
 Mohammad Mofrad
 Sriram Neelamegham
 Celeste Nelson
 Robert Nerem
 Jason Papin
 Shayn Peirce-Cottler
 Buddy Ratner
 Cynthia Reinhart-King
 Kristina Ropella
 Stanislav Shvartsman
 Scott Simon
 Christina Smolke
 Melody Swartz

Orthopedic and Rehabilitation Engineering

Rena Bizios
 Edward Botchwey
 Stephanie Bryant
 Jason Burdick
 Luis Cardoso
 Yu Chen
 Elizabeth Cosgriff-Hernandez
 John Desjardins
 Stefan Duma
 Jennifer Elisseeff
 John Fisher
 Yingxin Gao
 Warren Grayson
 Dan Hammer
 Sarah Heilshorn
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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. MCISAAC¹, J. PALLADINO², W. SISSON^{3,4}, B. LAWLER^{3,5}, M. EBRAHEEM², M. POWERS², AND S. ZERBINI^{3,6}

¹Univ. of CT/Hartford Hospital, Avon, CT, ²Trinity College, Hartford, CT, ³Hartford Hospital, Hartford, CT, ⁴Rensselaer Polytechnic Institute, Troy, NY, ⁵Duke University, Durham, NC, ⁶Wheaton 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. NGUYEN¹, C. ELLARD², AND A. LYON³

¹University of Texas at Austin, Austin, TX, ²Pillow Elementary, Austin, TX, ³Burnet 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. DELAINE¹, S. B. SEIF-NARAGHI², S. AL-HAQUE³, N. WOJEWODA⁴, Y. MENINATO⁵, AND J. DEBOER⁶

¹Drexel, Philadelphia, PA, ²University of California, San Diego, La Jolla, CA, ³University of Toronto, Toronto, Ontario, Canada, ⁴Student Platform for Engineering Education Development, Spoleto, Italy, ⁵Technische Universiteit Eindhoven, Eindhoven, Netherlands, ⁶Vanderbilt 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. LEE¹, K. S. SHARMA¹, E. A. FOX¹, AND G. WANG¹

¹Virginia Tech, Blacksburg, VA

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

P. BUSKOHL¹, A. BRITTENHAM², AND J. T. BUTCHER¹

¹Cornell University, Ithaca, NY, ²Elmcrest 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-MIELER¹, D. W. GATCHELL¹, AND J. WHITE²

¹Illinois Institute of Technology, Chicago, IL, ²Advocate Lutheran General Hospital, Park Ridge, IL

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

C. CASS¹, C. GOMILLION¹, B. HUNGERFORD², AND K. BURG¹

¹Clemson University, Clemson, SC, ²TL 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. CHAU¹, AND P. STASZUK¹

¹University 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. PASCHAL¹

¹Vanderbilt University, Nashville, TN

PS-7A-3-10 Engineering World Health: A World of Opportunity for Engineering StudentsM. D. BEARD¹, AND J. P. COOPER¹¹Engineering 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^{1,2}, L. MIDDLETON², R. DREZEK¹, AND T-K. YU²¹Rice University, Houston, TX, ²University 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. SHRESTHA¹, J. PARK¹, B. E. APPLGATE¹, P. PANDE¹, AND J. A. JO¹¹Texas A&M University, College Station, TX**PS-7A-4-13** Automated Calculation of Ptois on Clinical PhotographsE. KIM¹, J. LEE², E. K. BEAHM³, M. A. CROSBY³, G. P. REECE³, AND M. K. MARKEY¹¹The University of Texas Department of Biomedical Engineering, Austin, TX, ²Department of Electrical and Computer Engineering, The University of Texas at Austin, Austin, TX, ³Department 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. WHITNEY¹, B. WILL¹, C. ZAWASKI¹, H. DORN¹, D. GEOHEGAN², AND M. N. RYLANDER¹¹Virginia Tech, Blacksburg, VA, ²Oak Ridge National Laboratory, Oak Ridge, TN**PS-7A-4-15** Human Breast Tumor Co-registration of Optical Coherence Tomography and Biomedical Imaging ModalitiesJ. SUN¹, S. G. ADIE¹, AND S. A. BOPPART¹¹University 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. CHENG¹¹University of Pennsylvania, Philadelphia, PA**PS-7A-4-17** Size-tunable Fluorescent Probes: Encapsulation of Quantum Dots Within Polymeric MicellesL. CHOU¹, AND W. CHAN¹¹Donnelly Centre for Cellular and Biomolecular Research, University of Toronto, Toronto, Ontario, Canada**PS-7A-4-18** Computer-aided Detection of Spiculated MassesA. K. HU¹, G. S. MURALIDHAR¹, A. C. BOVIK¹, AND M. K. MARKEY¹¹The 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. WALSH¹, A. KAJDACS-BALLA², AND R. BHARGAVA¹¹University of Illinois at Urbana-Champaign, Urbana, IL, ²University of Illinois at Chicago, Chicago, IL**PS-7A-4-20** Confocal Microscope for Imaging Inflammation in the Mouse ColonM. A. SALDUA¹, AND K. C. MAITLAND¹¹Texas A&M University, College Station, TX**PS-7A-4-21** A Throughput-Optimized Detector for Multiple-Mouse Dynamic Contrast-Enhanced MRIM. S. RAMIREZ¹, AND J. A. BANKSON¹¹The 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. CHEN¹, J. LEELAWATTANACHAI¹, R. WONG^{1,2}, A. WANG³, A. NIKITIN¹, Y. WANG^{1,2}, AND M. JIN¹¹Cornell University, Ithaca, NY, ²Weill Cornell Medical College, New York, NY, ³Ocean Nanotech, Springdale, AR**PS-7A-4-23** A Comparison of Gold Nanoplates and Nanorods for Photoacoustic Image-Guided Photothermal TherapyG. P. LUKE¹, K. HOMAN¹, Y-S. CHEN¹, W. FREY¹, AND S. EMELIANOV¹¹University 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. MA¹, J. TAM¹, A. BORWANKAR¹, B. W. WILLSEY¹, D. RIGDON¹, K. SOKOLOV^{1,2}, R. RAMESH², AND K. P. JOHNSTON¹¹University of Texas at Austin, Austin, TX, ²M.D. Anderson Cancer Center, Houston, TX**PS-7A-4-25** Depth Discrimination and Quantitative Oximetry in Spectrally-resolved Optical MammographyY. YU¹, A. SASSAROLI¹, M. J. HOMER², R. A. GRAHAM², AND S. FANTINI¹¹Tufts University, Medford, MA, ²Tufts Medical Center, Boston, MA**PS-7A-4-26** A New Hybrid Tomosynthesis Reconstruction Method for Breast Cancer ImagingM. A. BARRERA¹, AND W. QIAN¹¹University of Texas at El Paso, El Paso, TX**PS-7A-4-27** Beveled Multifiber Probes for Polarized Reflectance Spectroscopy in TissueR. KARNIK¹, L. T. NIEMAN², AND K. SOKOLOV^{1,2}¹University of Texas at Austin, Austin, TX, ²University of Texas M.D. Anderson Cancer Center, Houston, TX**PS-7A-4-28** Intraoperative Imaging for Cancer Resection - Requirements for Real Time ImagingG. M. THURBER¹, J-L. FIGUEIREDO¹, AND R. WEISSELEDER¹¹Harvard Medical School/Mass General Hospital, Boston, MA**PS-7A-4-29** Electromagnetically Tracking System and Forceps for Transbronchial BiopsyL. GRUIONU¹, G. GRUIONU², AND J. CHOI³¹University of Craiova, Severin, MH, Romania, ²Indiana University School of Medicine, Indianapolis, IN, ³Catholic University of America, Washington, DC**PS-7A-4-30** Biodegradable Near-Infrared Plasmonic Nanoclusters for Biomedical ApplicationsJ. O. TAM¹, J. M. TAM¹, A. MURTHY¹, D. INGRAM¹, L. L. MA¹, K. A. TRAVIS¹, K. JOHNSTON¹, AND K. V. SOKOLOV¹¹University of Texas at Austin, Austin, TX**PS-7A-4-31** Uptake of Polymer Coated Silicon Nanocrystals in Cancer CellsP. PUVANAKRISHNAN¹, M. BOSCH¹, C. HESSEL¹, M. RASCH¹, B. A. KORGEL¹, AND J. W. TUNNELL¹¹The 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. KAMOUN¹, R. K. JAIN¹, AND L. L. MUNN¹¹MGH/HMS, Boston, MA**PS-7A-4-33** Effective Shape Feature Extraction Algorithms for Prostate Cancer Image AnalysisD. STOCKTON¹, F. YUAN², AND Y. FENG²¹UTSA/UTHSCSA, San Antonio, TX, ²UTSA, San Antonio, TX**PS-7A-4-34** Computer Aided Diagnosis (CAD) of Squamous Cell Carcinoma (SCC) of Head and Neck (H&N)Y. SHARMA¹, R. M. PARRY¹, S. H. RAZA¹, Q. CHAUDRY¹, T. H. STOKES¹, X. WANG², S. MULLER², G. Z. CHEN², AND M. D. WANG^{1,2}¹Georgia Institute of Technology, Atlanta, GA, ²Emory University, Atlanta, GA

PS-7A-4-35 Automated Renal Cell Carcinoma Subtype Classification using Cellular Features of Elliptical Models of Segmented Nuclear ClustersQ. CHAUDRY¹, S. H. RAZA¹, Y. SHARMA¹, S. KOTHARI², A. N. YOUNG⁴, AND M. D. WANG¹¹Georgia Institute of Technology, Atlanta, GA, ²Emory University, Atlanta, GA**PS-7A-4-36** Biodistribution and Reticuloendothelial System Uptake of ICG-loaded Nanocapsules in MiceB. BAHMANI¹, B. JUNG¹, S. GUPTA¹, AND B. ANVARI¹¹University of California, Riverside, CA**PS-7A-4-37** Development of Tumor-Targeted MRI Contrast Agent for ImagingL. CUI¹, C. KARMONIK², B. LORENZ¹, AND M. BIKRAM¹¹University of Houston, Houston, TX, ²Methodist Hospital, Houston, TX**PS-7A-4-38** A Dual-modality Optical Probe for Improving Prostate Cancer DiagnosisV. SHARMA¹, N. PATEL¹, AND H. LIU¹¹The University of Texas at Arlington, Arlington, TX**PS-7A-4-39** Analysis of Transit Time Tomography of Microwave Breast Imaging Data with CurveletsA. S. PAI¹, V. S. POTUNURU¹, AND W. QIAN¹¹University 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^{1,2}, W. G. JEROME³, D. J. MARON⁴, J. H. DICKERSON II^{1,2}, AND T. D. GIORGIO^{1,2}¹Vanderbilt University, Nashville, TN, ²Vanderbilt Institute of Nanoscale Science & Engineering, Nashville, TN, ³Vanderbilt University Medical Center, Nashville, TN, ⁴Vanderbilt Heart & Vascular Institute, Nashville, TN**PS-7A-5-41** Deep Tissue Optical Imaging of Decubitus UlcersR. MOZA¹, J. M. DIMAIO¹, AND J. MELENDEZ²¹UTSouthwestern Medical Center, Dallas, TX, ²Spectral MD Inc., Lakeway, TX**PS-7A-5-42** Directional Interpolation of Fluid Velocity FieldsC. M. ZWART¹, H. M. BABIKER¹, AND D. H. FRAKES¹¹Arizona State University, Tempe, AZ**PS-7A-5-43** A Novel Method to Quantify Late Gadolinium Enhancement in Cardiac MRI using Rician PDFsJ. H. JORDAN¹, W. G. HUNDLEY², AND C. A. HAMILTON^{1,2}¹VT-WFU School of Biomedical Engineering and Sciences, Winston-Salem, NC, ²Wake Forest University School of Medicine, Winston-Salem, NC**PS-7A-5-44** Automatic Measurement of CT Phantoms in Major Cardiovascular Population StudiesM. ZHENG^{1,2}, AND Y. GE^{1,2}¹Wake Forest University Health Sciences, Winston-Salem, NC, ²VT-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. SULLIVANT¹, G. J. STEYER¹, L. KANODIA¹, D. ROY¹, M. PENN², AND D. L. WILSON¹¹Case Western Reserve University, Cleveland, OH, ²Cleveland Clinic, Cleveland, OH**PS-7A-5-46** Imaging Tools to Study the Lymphatic SystemT. J. AKL¹, E. RAHBAR¹, Z. V. NEPIYUSHCHIKH², J. E. MOORE¹, A. A. GASHEV², D. C. ZAWIEJA², AND G. L. COTÉ¹¹Texas A&M University, College Station, TX, ²Texas A&M Health Science Center, Temple, TX**PS-7A-5-47** Design of Molecular Imaging Agent for Atherosclerosis-Targeting to Activated MacrophagesA. L. DOIRON¹, L. ANDERSEN¹, A-L. AULANIER¹, R. SHEPHERD¹, K. D. RINKER¹, AND R. FRAYNE¹¹University of Calgary, Calgary, Alberta, Canada**PS-7A-5-48** Echocardiographic Characterization of the Postnatal Development of Elastin-Insufficient MiceV. LE¹, AND J. WAGENSEIL¹¹Saint Louis University, Saint Louis, MO**PS-7A-5-49** Depolarizing the Mitochondrial Network is Not Cardioprotective During Global IschemiaR. M. SMITH¹, S. S. VELAMAKANNI¹, AND E. G. TOLKACHEVA¹¹University of Minnesota, Minneapolis, MN**PS-7A-5-50** Design and Build of Left Ventricular Motion Phantom for Cardiac MRIM. ERSOY¹, M. KOTYS², X. ZHOU³, AND R. M. SETSER^{1,3}¹Cleveland State University, Cleveland, OH, ²Philips Healthcare, Cleveland, OH, ³Cleveland Clinic, Cleveland, OH**PS-7A-5-51** Automatic Cardiac & Respiratory Cycle Detection of Self-gated Cardiac Cine MRI Navigator ProjectionsD. N. MHEMBERE^{1,2}, L. GUO¹, J. A. DERYSHIRE³, E. R. MCVEIGH¹, AND D. A. HERZKA¹¹Johns Hopkins School of Medicine, Baltimore, MD, ²Morgan State University, Baltimore, MD, ³DIR, NHLBI, NIH, DHHS, Bethesda, MD**PS-7A-5-52** Biophysical Properties of Vascular Endothelial Cells Upon Drug-loaded Nanoparticle DeliveryY. WU¹, G. D. MCEWEN¹, S. KONA², H. XU², K. T. NGUYEN², AND A. ZHOU¹¹Utah State University, Logan, UT, ²University of Texas at Arlington, Arlington, TX**PS-7A-5-53** Imaging the Endothelial Glycocalyx Response to Flow and Role in MechanotransductionE. E. EBONG^{1,2}, D. C. SPRAY², AND J. M. TARBELL¹¹The City College of New York, New York, NY, ²Albert Einstein College of Medicine, Bronx, NY**PS-7A-5-54** Predicting the Local Onset of Alternans in HeartA. R. CRAM¹, H. RAO¹, AND E. G. TOLKACHEVA¹¹University of Minnesota, Minneapolis, MN**PS-7A-5-55** Multi Channel Phased Array Coils for Small Animal Cardiac ImagingC-W. CHANG¹, K. FENG¹, J. BOSSHARD¹, K. L. MOODY¹, S. M. WRIGHT¹, AND M. P. MCDUGALL¹¹Texas 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. MELNIKER¹, AND D. J. ORBACH¹¹NY Methodist Hospital, Brooklyn, NY**PS-7A-5-57** A Blood Pool Contrast Agent for Cardiovascular Computed Tomography ImagingK. B. GHAGHADA¹, O. KRAVCHUK², S. HAYNES², A. HALAWESH², A. DIVEKA², E. VAN BEEK³, E. HOFFMAN², AND A. ANNAPRAGADA¹¹The University of Texas Health Science Center, Houston, TX, ²The University of Iowa, Iowa City, IA, ³The University of Edinburgh, Edinburgh, United Kingdom**PS-7A-5-58** High Speed Doppler Fourier Domain Optical Coherence TomographyR. WANG¹, R. GOODWIN², R. R. MARKWALD³, AND B. Z. GAO¹¹Clemson Univ., Clemson, SC, ²University of South Carolina, Columbia, SC, ³Medical 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. CHAPUNG¹, AND P. CABRALES¹¹University of California, San Diego, La Jolla, CA**PS-7A-6-60** Cardiac Systolic Function Recovery After Hemorrhage Determines Survivability During ShockS. CHAPUNG¹, AND P. CABRALES¹¹University 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. YU¹, N. CHI², AND T. K. HSIAI¹¹University of Southern California, Los Angeles, CA, ²University of California, San Diego, San Diego, CA**PS-7A-6-62** Pulsed Infrared (IR) Radiation Evoked Calcium Release in Neonatal Cardiac MyocytesG. M. DITTAMI¹, S. M. RAJGURU², R. A. LASHER¹, R. W. HITCHCOCK¹, S. S. DHARIA¹, AND R. D. RABBITT¹¹University of Utah, Salt Lake City, UT, ²Northwestern University, Chicago, IL**PS-7A-6-63** The Effect of Substrate Stiffness on Cardiomyocyte Action Potential Decay TimeJ. D. MYERS¹, AND J. G. JACOT^{1,2}¹Rice University, Houston, TX, ²Texas 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. JING¹, AND A. PATWARDHAN¹¹University of Kentucky, Lexington, KY**PS-7A-6-65** Single Probe, Fiber Optic System for Whole Heart Intracellular Calcium Transient MeasurementC. EVANS¹, S. WOODRUFF², B. CHORPENING², J. HENSEL², AND S. SHROFF¹¹University of Pittsburgh, Pittsburgh, PA, ²National Energy Technology Lab, Morgantown, WV**PS-7A-6-66** The FFT Estimates Epicardial Activation Rate in Pigs but Not Dogs in Late Ventricular FibrillationJ. HUANG¹, D. J. DOSDALL¹, L. LI¹, AND R. E. IDEKER¹¹University of Alabama at Birmingham, Birmingham, AL**PS-7A-6-67** Frequency Domain Analysis of Heart Rate Variability Using Interpolation and ResamplingN. NADVAR¹, B. E. DUNNE¹, J. HEISNER², A. K. CAMARA², D. F. STOWE², AND S. S. RHODES^{1,2}¹Grand Valley State University, Grand Rapids, MI, ²Medical College of Wisconsin, Milwaukee, WI**PS-7A-6-68** Excitability and Stimulation Thresholds for Nanosecond Pulses in Fish HeartsS. KNISLEY¹, H. R. PHADKE¹, J. KOLB¹, K. SCHOENBACH¹, AND J. PRATT¹¹Old Dominion University, Norfolk, VA**PS-7A-6-69** Noninvasively Pacing the Embryonic Heart with a Pulsed LaserM. W. JENKINS¹, A. R. DUKE², S. GU¹, H. J. CHIEL¹, H. FUJIOKA¹, M. WATANABE¹, E. D. JANSEN², AND A. M. ROLLINS¹¹Case Western Reserve University, Cleveland, OH, ²Vanderbilt University, Nashville, TN**PS-7A-6-70** Electrophysiological Changes of Differentiating Bone Marrow Stem Cells Laser Patterned with CardiomyocytesZ. MA¹, H. LIU¹, X. J. YUN¹, T. K. BORG², R. R. MARKWALD², AND Z. B. GAO¹¹Clemson University, Clemson, SC, ²Medical University of South Carolina, Charleston, SC**PS-7A-6-71** Effects of Micropatterned Obstacles on Propagation in the Cardiac MonolayerH. HIMEL IV¹, AND N. BURSAC¹¹Duke 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. BISWAS¹, T. SNOWDEN¹, AND J. CRISCIONE¹¹Texas A&M University, College Station, TX**PS-7A-7-73** The Admittance Method for the Measurement of Left Ventricular Volume in Large AnimalsE. R. LARSON¹, J. E. PORTERFIELD¹, J. W. VALVANO¹, M. D. FELDMAN², AND J. A. PEARCE¹¹The University of Texas at Austin, Austin, TX, ²The 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. YOSHINO¹, M. SATO^{1,2}, AND K. INOUE³¹Graduate School of Engineering, Tohoku University, Sendai, Japan, ²Graduate School of Biomedical Engineering, Tohoku University, Sendai, Japan, ³Emeritus 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. SHERIF¹¹Cardiac Surgery, Newark, DE**PS-7A-7-76** Minimally Invasive Cardiac Support and Assist Therapy for the Treatment of Congestive Heart FailureM. R. MORENO^{1,2}, AND J. C. CRISCIONE^{1,2}¹Texas A&M University, College Station, TX, ²Corlnnova Incorporated, College Station, TX**PS-7A-7-77** Left Ventricular Volume for Heart Failure Monitoring Using AdmittanceJ. E. PORTERFIELD¹, E. R. LARSON¹, J. T. JENKINS^{2,3}, D. ESCOBEDO^{2,3}, M. D. FELDMAN^{2,3}, J. W. VALVANO¹, AND J. A. PEARCE¹¹The University of Texas at Austin, Austin, TX, ²The University of Texas Health Science Center, San Antonio, TX, ³South Texas Veterans Health Care System, San Antonio, TX**PS-7A-7-78** Frictional Load of Shape Memory Polymer Devices Delivered via CatheterW. HWANG¹, T. S. WILSON², AND D. J. MAITLAND¹¹Texas A&M University, College Station, TX, ²Lawrence Livermore National Laboratory, Livermore, CA**PS-7A-7-79** Finite Element Simulation of Pacemaker Lead Dislodgement in Left Marginal Vein: Potential Risk FactorsX. ZHAO¹, M. BURGER², Y. LIU¹, AND G. S. KASSAB¹¹Indiana University-Purdue University, Indianapolis, IN, ²Livermore Software Technology Corporation, Livermore, CA**PS-7A-7-80** Assessment of Hemodynamic Parameters Using Esophageal Doppler MonitorP. THAKORE¹, A. RITTER², AND G. ATLAS³¹Stevens Institute of Technology, Jersey City, NJ, ²Stevens Institute of Technology, Hoboken, NJ, ³UMDNJ, Livingston, NJ**PS-7A-7-81** FEA Analysis of a Biodegradable Alginate StentH. ZEID¹, AND M. MOBED MIREMADI²¹San Jose State University, Campbell, CA, ²San Jose State University, San Jose, CA**PS-7A-7-82** In Vitro Fluid Dynamic Effects of a New Coil Design for Cerebral Aneurysm EmbolizationH. BABIKER¹, F. GONZALEZ², F. ALBUQUERQUE², D. COLLINS¹, A. ELVIKIS¹, AND D. FRAKES¹¹Arizona State University, Tempe, AZ, ²St. 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. VOIGT¹, C. F. BUCHANAN¹, J. SCHMIEG¹, M. N. RYLANDER¹, AND P. P. VLACHOS¹
¹Virginia Tech, Blacksburg, VA**PS-7A-8-84** Using Computational Fluid Dynamics Model to Predict Changes in Velocity properties in Stented Carotid ArteryV. B. SHETH¹, AND A. B. RITTER¹
¹Stevens Institute of Technology, Hoboken, NJ**PS-7A-8-85** Anatomical Analysis of Optiflo on Patient Specific GeometriesK. DESAI¹, C. HAGGERTY¹, D. ZELICOURT¹, M. FOGEL², K. KANTER³, AND A. YOGANATHAN¹
¹Georgia Institute of Technology, Atlanta, GA, ²Children's Hospital of Philadelphia, Philadelphia, PA, ³Emory University, Atlanta, GA**PS-7A-8-86** Study of the Hemodynamics in Dialysis Access FistulaeP. M. MCGAH¹, J. J. RILEY¹, AND A. ALISEDA¹
¹University 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^{1,2}, J. SUO^{1,2}, P. ESHTEHARDI³, S. S. DHAWAN³, A. R. KING^{1,2}, M. C. MCDANIEL³, H. SAMADY³, AND D. P. GIDDENS^{1,2}
¹Georgia Institute of Technology, Atlanta, GA, ²Emory University, Atlanta, GA, ³Emory University School of Medicine, Atlanta, GA**PS-7A-8-88** Comparison of Inlet Flow Profiles in Patient-Specific Computational Fluid DynamicsI. CAMPBELL¹, J. RIES², W. TAYLOR^{1,3}, AND J. OSHINSKI^{1,3}
¹Georgia Institute of Technology/Emory University, Atlanta, GA, ²Georgia Institute of Technology, Atlanta, GA, ³Emory University, Atlanta, GA**PS-7A-8-89** Flow Reduction in an Intracranial Aneurysm by Multiple Stent DeploymentM. IONESCU¹, AND R. W. METCALFE¹
¹University of Houston, Houston, TX**PS-7A-8-90** Hematocrit-Dependent Red Blood Cell Exclusion and Restriction Zones are Present at the Wall of ArteriolesO. YALCIN¹, M. JIVANI¹, M. INTAGLIETTA¹, AND P. JOHNSON¹
¹UC San Diego, La Jolla, CA**PS-7A-8-91** Quantitative Variation Of Blood Pressure Dynamics During Simulated Sleep ApneaR. M. ALEX¹, D. E. WATENPAUGH², R. ZHANG³, A. BASHABOYINA¹, G. BHAVE¹, M. AL-ABED¹, S. IYER¹, E. ALTUWAJRI¹, AND K. BEHBEHANI¹
¹University of Texas At Arlington, Arlington, TX, ²Sleep Consultants, Inc., Fort Worth, TX, ³Presbyterian 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. SANKARAN¹, AND A. MARSDEN²
¹University of California San Diego, San Diego, CA, ²University of California San Diego, La Jolla, CA**PS-7A-8-93** Hemodynamics in a Patient Specific Stented ArteryM. IONESCU¹, AND R. W. METCALFE¹
¹University of Houston, Houston, TX**PS-7A-8-94** Measured Flow in Compliant AAA Models with Iliac BifurcationC. A. MEYER¹, C. GUIVIER-CURIEN¹, E. BERTRAND¹, AND V. DEPLANO¹
¹IRPHE UMR 6594 CNRS, Marseille, France**PS-7A-8-95** Large Eddy Simulations Of Blood Flow In A Patient-Specific Aneurysmatic Carotid Artery GeometryH. RADHAKRISHNAN¹, D. GRIGORIADIS¹, AND S. C. KASSINOS¹
¹University 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. PIDAPARTHI¹, N. LAKKADI¹, R. SETSER², S. FLAMM², AND C. GEORGE¹
¹Cleveland State University, Cleveland, OH, ²Cleveland Clinic, Cleveland, OH**PS-7A-8-97** Using CFD to Model Effects of Aortic Compliance Changes Related to Treatments for Aortic CoarctationJ. S. COOGAN¹, F. P. CHAN¹, C. A. TAYLOR¹, AND J. A. FEINSTEIN¹
¹Stanford University, Stanford, CA**PS-7A-8-98** Longitudinal MRI-based CFD Analysis of Hemodynamics in a Porcine Model of Dialysis Graft StenosisR. J. CHRISTOPHERSON¹, C. M. TERRY², H. LI², I. ZHUPLATOV², A. K. CHEUNG^{2,3}, AND Y-T. E. SHIU^{1,2}
¹Department of Bioengineering, University of Utah, Salt Lake City, UT, ²Department of Medicine, University of Utah, Salt Lake City, UT, ³The 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. SAN¹, AND A. E. STAPLES¹
¹Virginia 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. THOMAS¹, M. SHAKERI¹, R. E. BERSON¹, AND M. K. SHARP¹
¹University 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. CHEN¹, M. STUREK², D. BHATT², AND G. KASSAB⁴
¹Purdue University, West Lafayette, IN, ²Indiana University, Indianapolis, IN, ³Harvard Medical School, Boston, MA, ⁴Indiana 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. HUNLEY¹, S. MEHROTRA¹, K. M. PAWELEC¹, L. ZHANG¹, C. CHAN¹, AND S. BAEK¹
¹Michigan State University, East Lansing, MI**PS-7A-9-103** Oligomeric Amyloid Beta Peptide on Sialic LewisX-selectin Bonding at Cerebral Endothelial SurfaceS. ASKAROVA¹, AND J. C-M. LEE¹
¹University of Missouri, Columbia, MO**PS-7A-9-104** Quantifying ECM Signaling in Tumor Invasion: Covalent Links Influence Cell DynamicsJ. SRIVASTAVA¹, AND M. ZAMAN²
¹University of Texas at Austin, Austin, TX, ²Boston University, Boston, MA**PS-7A-9-105** Lymphocyte Dynamics on Aligned Endothelial CellsK. SONG¹, K. KWON², J-C. CHOI³, K. SUH², AND J. DOH³
¹POSTECH, Pohang, Gyeongbuk, Korea, Republic of, ²Seoul National University, Seoul, Korea, Republic of, ³POSTECH, 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. YOUSSEF¹, AND J. R. MORGAN¹¹Brown University, Providence, RI**PS-7A-9-107 Forward Ray Tracing for High-Throughput Cell Deformation Cytometry with Diode Bar Optical Stretchers**I. SRAJ¹, D. W. MARR², AND C. D. EGGLETON¹¹UMBC, Baltimore, MD, ²Colorado School of Mines, Golden, CO**PS-7A-9-108 Biomechanical Effects of Flow and Coculture Environment on Endothelial Progenitor Cells**L. CAO¹, AND G. A. TRUSKEY¹¹Duke University, Durham, NC**PS-7A-9-109 The Effect of Mechanoregulation on Myotube Alignment During Myogenesis**M. JUNKIN¹, AND P. K. WONG¹¹University of Arizona, Tucson, AZ**PS-7A-9-110 Assembly of Human Umbilical Vein Endothelial Cells on Compliant Hydrogels**R. SAUNDERS¹, AND D. HAMMER¹¹University of Pennsylvania, Philadelphia, PA**PS-7A-9-111 sPLA2-III Enhances sAPP α Secretion Through Alterations in Membrane Fluidity**X. YANG¹, W. SHENG¹, Y. HE¹, J. CUI¹, M. HAIDEKKER², G. SUN¹, AND J. LEE¹¹University of Missouri, Columbia, MO, ²University of Georgia, Athens, GA**PS-7A-9-112 Effects of Fatty Acid Unsaturation Numbers on Membrane Fluidity and APP pProcessing**X. YANG¹, W. SHENG¹, G. SUN¹, AND J. LEE¹¹University of Missouri, Columbia, MO**PS-7A-9-113 System-Level Analysis of Collective Cell Migration in Cancer**D. HARJANTO¹, AND M. H. ZAMAN¹¹Boston University, Boston, MA**PS-7A-9-114 Endothelial Sarcomere Fluctuations Arise from Actin Polymerization at Focal Adhesions**R. J. RUSSELL¹, S. MANGROO¹, S. NAKASONE¹, R. DICKINSON¹, AND T. LELE¹¹University of Florida, Gainesville, FL**PS-7A-9-115 Computational Analysis of Tensile Stress Propagation During the Migration of a Cohesive Cell Sheet**R. E. ZIELINSKI¹, C. MIHAI^{1,2}, D. L. KNOELL^{1,2}, AND S. N. GHADIALI^{1,2}¹The Ohio State University, Columbus, OH, ²Dorothy 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. RICART¹, B. JOHN¹, C. A. HUNTER¹, AND D. A. HAMMER¹¹University of Pennsylvania, Philadelphia, PA**PS-7A-9-117 Proteolytic Activity Disturbs the Responses of Endothelial Cells to Fluid Shear Stress**A. E. ALTSHULER¹, S. CHIEN¹, AND G. W. SCHMID-SCHONBEIN¹¹University 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. TATA¹, S. M. N. RAO¹, K. NGUYEN¹, AND J.-C. CHIAO¹¹University of Texas at Arlington, Arlington, TX**PS-7A-9-119 Motor-Clutch Motility Model for U251 Glioblastoma Migration**B. L. BANGASSER¹, C. CHAN¹, S. S. ROSENFELD², AND D. J. ODDE¹¹University of Minnesota, Minneapolis, MN, ²Columbia University, New York, NY**PS-7A-9-120 The Pyrophosphate Transporter ANKH Is Necessary For Mechanotransduction In The MC3T3 Cell Line**K. L. LEE¹, AND C. R. JACOBS¹¹Columbia University, New York, NY**PS-7A-9-121 Biomimetic Gel Material to Modulate Branching Morphogenesis of Submandibular Gland**H. MIYAJIMA¹, S. AN¹, K. LEE², T. SAKAI¹, AND T. MATSUMOTO¹¹Osaka University, Suita, Japan, ²Hanyang University, Seoul, Korea, Republic of**PS-7A-9-122 Observation of Podosome Assembly and Disassembly in Real Time *in Vitro***N. KIM¹, J. HUYNH¹, AND C. A. REINHART-KING¹¹Cornell University, Ithaca, NY**PS-7A-9-123 Dissecting the Active Gel Dynamics of the Microtubule Cytoskeleton in Living Epithelial Cells**B. D. HOFFMAN¹, K. M. VAN CITTERS², A. W. LAU³, AND J. C. CROCKER²¹University of Virginia, Charlottesville, VA, ²University of Pennsylvania, Philadelphia, PA, ³Florida Atlantic University, Boca Raton, FL**PS-7A-9-124 Microrheological Assessment of the Viscoelastic Properties of Cardiac Myocytes**J. MICHAELSON¹, H. CHO², P. SO², S. WASSERMAN², AND H. HUANG¹¹Columbia University, New York, NY, ²Massachusetts 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. CALLIHAN¹, K. MIKHOVA¹, AND J. D. BRYERS¹¹University of Washington, Seattle, WA**PS-7A-9-126 Effect of Cell and Microvillus Elasticity on Intermolecular Bond Rupture**V. K. GUPTA¹, AND C. D. EGGLETON¹¹University 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. DARLING¹¹Brown University, Providence, RI**PS-7A-9-128 A Microfluidic Shear Reactor to Study Biofilm Formation and Development**W. M. WEAVER¹, V. MILISAVLJEVIC², AND D. DI CARLO^{1,3}¹University of California, Los Angeles, Los Angeles, CA, ²David Geffen School of Medicine, UCLA, Los Angeles, CA, ³California NanoSystems Institute, Los Angeles, CA**PS-7A-9-129 Effect of Substrate Stiffness on U251 Glioblastoma Morphology and Motility**K. OPOKU¹, C. CHAN¹, E. TUZEL¹, S. ROSENFELD², AND D. ODDE¹¹University of Minnesota, Minneapolis, MN, ²Columbia 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^{1,2}, P. GANATOS¹, D. C. SPRAY², AND S. WEINBAUM¹¹The City College of New York, New York, NY, ²Albert Einstein College of Medicine, Bronx, NY**PS-7A-9-131 Osteocyte Characterization on Polydimethylsiloxane Substrates: Quantification of Communication**L. SIMMERMAN¹, P. SETHU², AND M. SAUNDERS¹¹University of Kentucky, Lexington, KY, ²University of Louisville, Louisville, KY**PS-7A-9-132 Osteocyte Characterization on Polydimethylsiloxane Substrates: Viability, Growth and Sclerostin**L. SIMMERMAN¹, J. MARTIN¹, P. SETHU², AND M. SAUNDERS¹¹University of Kentucky, Lexington, KY, ²University 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^{1,2}, L. KERSCHER^{1,2}, C. FRANCK^{1,2}, M. A. HEMPHILL^{1,2}, J. A. GOSS^{1,2}, P. W. ALFORD^{1,2}, AND K. K. PARKER^{1,2}¹Disease Biophysics Group, School of Engineering and Applied Sciences, Harvard University, Cambridge, MA, ²Wyss 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. DOWNS¹, D. HOOEY¹, F. HERZOG², AND C. R. JACOBS¹¹Columbia University, New York, NY, ²Ecole Polytechnique Fédérale de Lausanne, Lausanne, Vaud, Switzerland**PS-7A-9-135** Nanotopology Guided Migration of T Cells in 2D and 3DK. KWON¹, W. JEONG², J. CHOI², K. SONG², K-Y. SUH¹, AND J. DOH²¹Seoul National University, Gwanak-gu, Seoul, Korea, Republic of, ²Pohang 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. ELÓSEGUI¹, C. GÁZQUEZ², A. OREGI¹, A. GIL¹, R. ALDABE², AND E. DE JUAN-PARDO¹¹CEIT and TECNUN (University of Navarra), San Sebastián, Guipuzcoa, Spain, ²FIMA University of Navarra, Pamplona, Navarra, Spain**PS-7A-9-137** Molecular Clues to Aberrant Nuclear Structure in Human Aging and DiseaseA. KALINOWSKI¹, S. SHENOY¹, M. LOESCHE¹, AND K. N. DAHL¹¹Carnegie Mellon University, Pittsburgh, PA**PS-7A-9-138** Endothelial Cell Phenotyping Using Receptor Expression Changes in Microfluidic ChannelsD. VICKERS¹, AND S. MURTHY¹¹Northeastern University, Boston, MA**PS-7A-9-139** Impedance Analysis of Cellular Activities of Oral Cancer Cells and Normal Epithelial CellsL. YANG¹¹North Carolina Central University, Durham, NC**PS-7A-9-140** Interaction of Dendritic Cells with Different Matrices and VEGF BiologyL. SPRAGUE¹, E. MELES¹, A. VENKATESH¹, M. PATE¹, AND F. BENENCIA^{1,2}¹Ohio University, Athens, OH, ²Russ College of Engineering, Ohio University, Athens, OH**PS-7A-9-141** Cancer Stem Cells and Adhesion Molecules: New Insights for Breast Cancer MetastasisV. S. SHIRURE¹, K. A. HENSON¹, AND M. M. BURDICK¹¹Ohio University, Athens, OH**PS-7A-9-142** Upregulation of Wnt5a Transcripts in Human Monocytes Treated with oxLDLP. M. BHATT¹, C. J. LEWIS¹, D. L. HOUSE¹, D. J. GOETZ¹, AND R. MALGOR¹¹Ohio University, Athens, OH**PS-7A-9-143** *In Vitro* Elongation of Porcine Embryos Using Alginate Hydrogels as a Three-Dimensional Extracellular MatrixC. N. SARGUS¹, S. A. PLAUTZ¹, J. R. MILES², J. VALLET², AND A. K. PANNIER¹¹University of Nebraska-Lincoln, Lincoln, NE, ²USDA-ARS U.S. Meat Animal Research Center, Clay Center, NE**PS-7A-9-144** Parametric Analysis of Cyclic Strain Effects on Cell-cell AdhesionsJ. SIM¹, C. SIMMONS¹, P. BAECHTOLD¹, N. BORGHI¹, AND B. L. PRUITT¹¹Stanford University, Stanford, CA**PS-7A-9-145** Massively Parallel, High Force Interrogation of Single Cell Mechanics via Localized Magnetic NanoparticlesP. TSENG¹, J. JUDY¹, AND D. DI CARLO¹¹UCLA, Los Angeles, CA**PS-7A-9-146** Chemomechanical Mapping of Lutheran/B-CAM Interaction in Erythrocytes of Hemoglobin Genotype ASJ. L. MACIASZEK¹, AND G. LYKOTRAFITIS¹¹University of Connecticut, Storrs, CT**PS-7A-9-147** The Effect of Metallic Nanoparticles on Vascular Smooth Muscle Cell MechanicsW. MCALLISTER¹, L. WILES¹, J. TURBEVILLE¹, P. KERSHER¹, C. KITCHENS¹, AND D. DEAN¹¹Clemson University, Clemson, SC**PS-7A-9-148** Human a(1,3) Fucosyltransferases Regulating Selectin-Mediated Leukocyte AdhesionA. BUFFONE, JR.¹, K. P. MCHUGH¹, AND S. NEELAMEGHAM¹¹State University of New York at Buffalo, Buffalo, NY**PS-7A-9-149** Guided Schwann Cell Motility on Cellular Scale Anisotropic TopographyJ. A. MITCHEL¹, T. RAMCHAL¹, AND D. HOFFMAN-KIM¹¹Brown University, Providence, RI**PS-7A-9-150** Differential Roles of Stretch and Shortening on Cyclic Stretch-induced Stress Fiber AlignmentC-F. LEE¹, H-J. HSU¹, AND R. KAUNAS¹¹Texas A&M University, College Station, TX**PS-7A-9-151** Incorporating Cellular Mechanical Heterogeneity in a Multicellular Mechanical ModelS. DEITCH¹, AND D. DEAN¹¹Clemson University, Clemson, SC**PS-7A-9-152** Digital Microfluidic Techniques for Single-Cell *In Vitro* Developmental Neurotoxicity ScreeningA. J. SWEENEY¹, K. J. BURG¹, T. K. BORG², AND B. Z. GAO¹¹Clemson University, Clemson, SC, ²Medical 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. REEN¹, A. L. SIEMINSKI², M. D. STEVENSON¹, M. BOEHM¹, B. JODDAR¹, K. W. KOELLING¹, AND K. J. GOOCH¹¹Ohio State University, Columbus, OH, ²Franklin 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. LEE¹, AND C. FRANCK¹¹Brown University, Providence, RI**PS-7A-9-155** Myofibrillogenesis in Single Myocytes Cultured on Aligned-collagenH. LIU¹, J. YUN¹, T. BORG², AND B. GAO¹¹Clemson University, Clemson, SC, ²Medical University of South Carolina, Charleston, SC**PS-7A-9-156** Microtubule Depolymerization Induces Traction Force Increase in Two Distinct PathwaysA. D. RAPE¹, W. GUO¹, AND Y-L. WANG¹¹Carnegie Mellon University, Pittsburgh, PA**PS-7A-9-157** Integrin Mediated Injury in Neurons: A Role for Mechanotransduction in Mild Traumatic Brain InjuryM. A. HEMPHILL^{1,2}, B. E. DABIRI^{1,2}, J. A. GOSS^{1,2}, P. W. ALFORD^{1,2}, AND K. K. PARKER^{1,2}¹Disease Biophysics Group, School of Engineering and Applied Sciences, Harvard University, Cambridge, MA, ²Wyss 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. OUNKOMOL¹, T. N. NGUYEN¹, S. YAMADA¹, AND V. HEINRICH¹¹University of California, Davis, Davis, CA**PS-7A-9-159** Differential Talin and Vinculin Expression During Vascular Smooth Muscle Cell MechanotransductionO. V. SAZONOVA¹, K. L. LEE¹, J. Y. WONG¹, AND M. A. NUGENT^{1,2}¹Boston University, Boston, MA, ²Boston University School of Medicine, Boston, MA

PS-7A-9-160 Contribution of Vimentin Intermediate Filament to Cell Strength and MechanotransductionM. E. MURRAY¹, AND P. A. JANMEY¹¹University of Pennsylvania, Philadelphia, PA**PS-7A-9-161** Dynamic Stretching of Single Live Cells on an Elastomeric Micropost ArrayJ. MANN¹, AND J. FU¹¹University of Michigan, Ann Arbor, MI**PS-7A-9-162** Mechanically-Induced Remodeling of Fibroblast Cytoskeletal in 3D CulturesS-L. LEE¹, K. PRYSE², AND E. ELSON²¹Washington University, Saint Louis, MO, ²Washington 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. TONG¹, M. DALLAS¹, W-C. HUNG¹, K. STEBE², AND K. KONSTANTOPOULOS¹¹Johns Hopkins University, Baltimore, MD, ²University of Pennsylvania, Philadelphia, PA**PS-7A-9-164** Rigidity-dependent Costimulation of CD4+ T cellsE. JUDOKUSUMO¹, E. TABDANOV¹, AND L. C. KAM¹¹Columbia University, New York, NY**PS-7A-9-165** The Cytoskeleton Modifies the Hyperosmotic Response of the Cell MembraneV. RAGOONANAN¹, AND A. AKSAN¹¹University of Minnesota, Minneapolis, MN**PS-7A-9-166** Characterization of Notch Ligand Endocytosis Using Laser TweezersE. BOTVINICK¹, B. S. SHERGILL¹, G. WEINMASTER², L. MELOTY-KAPELLA² AND A. MUSSE²¹UC Irvine, Irvine, CA, ²UC LA, Los Angeles, CA**PS-7A-9-167** Blocking Agent Effects on Motor Protein Motility in the *In Vitro* Motility AssayK. N. MILLER-JASTER¹, AND W. GUILFORD¹¹University of Virginia, Charlottesville, VA**PS-7A-9-168** Nanofibrous Engineered Surfaces for Study of Bacterial Adhesion and Biofilm FormationM. KARGAR¹, J. WNAG¹, A. S. NAIN¹, AND B. BEHKAM¹¹Virginia Tech, Blacksburg, VA**PS-7A-9-169** Transforming Growth Factor- α Enhances the Chemotactic Migration of Platelet-Derived Growth Factor Induced Anaplastic OligodendrogliomasR. A. ABLE^{1,2}, C. NYABEO², E. HOLLAND³, AND M. VAZQUEZ²¹The Graduate Center of CUNY, New York, NY, ²City College of New York, New York, NY, ³Memorial 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 WALLE¹, T. SPAIN¹, AND D. W. SCHMIDTKE¹¹University of Oklahoma, Norman, OK**PS-7A-9-171** Influence of Cell Deformation, Tether Formation and Catch/slip Bond Behavior on Leukocyte RollingD. B. KHISMATULLIN¹, M. K. POSPIESZALSKA², AND K. LEY²¹Tulane University, New Orleans, LA, ²La 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. MUDDANA¹, D. AHMED¹, T. J. HUANG¹, AND P. J. BUTLER¹¹Penn State University, University Park, PA**PS-7A-9-173** Evaluation of Elasticity Analyses of Non-Malignant and Malignant Breast Cells Using AFMM. NIKKHAH¹, J. STROBL¹, E. M. SCHMELZ¹, AND M. AGAH¹¹Virginia Tech, Blacksburg, VA**PS-7A-9-174** Strain and Ligand Dependent Activation of TGF-beta 1 by 3T3 FibroblastsM. K. SEWELL¹, J. D. HUTCHESON¹, AND W. D. MERRYMAN¹¹Vanderbilt University, Nashville, TN**PS-7A-9-175** Regulation of Focal Adhesion Maturation and Cell Edge Dynamics by Epidermal Growth FactorI. SCHNEIDER¹, AND Y. HOU¹¹Iowa State University, Ames, IA**PS-7A-9-176** Mapping the Interactions among Arrayed Biomaterials, Adsorbed Proteins and Human Embryonic Stem CellsY. MEI¹, S. GERECHT², M. TAYLOR³, A. URQUHART⁴, S. R. BOGATYREV¹, S-W. CHO¹, M. C. DAVIES⁵, M. R. ALEXANDER⁵, R. LANGER¹, AND D. ANDERSON¹¹MIT, Cambridge, MA, ²Johns Hopkins University, Baltimore, MD, ³University of Central Lancashire, Lancashire, United Kingdom, ⁴University of Strathclyde, Glasgow, United Kingdom, ⁵The 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^{1,2}, T. MURASE¹, N. SAKAMOTO¹, T. OHASHI^{1,3}, AND M. SATO¹¹Tohoku University, Sendai, Japan, ²Present: Nagoya Institute of Technology, Nagoya, Japan, ³Present: Hokkaido University, Sapporo, Japan**PS-7A-10-178** A Microfabricated Insert for Precise Control Over the Oxygen Concentration within the Boyden ChamberS. C. OPPEGARD¹, A. J. BLAKE¹, J. C. WILLIAMS², AND D. T. EDDINGTON¹¹University of Illinois at Chicago, Chicago, IL, ²University of Wisconsin - Madison, Madison, WI**PS-7A-10-179** A High-throughput Microfluidic Platform for Separating Particles by SizeG. WANG¹¹Georgia Institute of Technology, Atlanta, GA**PS-7A-10-180** Addressable Micropatterning of Multiple Proteins and Cells with an Aqueous-processible PhotoresistJ-C. CHOI¹, K. SONG¹, M. KIM¹, H-R. JUNG¹, AND J. DOH¹¹POSTECH, 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. AU¹, W. C. WATT¹, D. R. STORM¹, AND A. FOLCH¹¹University of Washington, Seattle, WA**PS-7A-10-182** Parallel Microfluidic Gradient Generator Array for Studying the Response of Individually Isolated Neurons to Biochemical GradientsN. BHATTACHARJEE¹, AND A. FOLCH¹¹University of Washington, Seattle, WA**PS-7A-10-183** Development of a Physiologically Relevant *In Vitro* Model of the Blood-Brain BarrierJ. D. WANG¹, N. DOUVILLE¹, S. TAKAYAMA¹, AND M. E. EL-SAYED¹¹University of Michigan, Ann Arbor, MI**PS-7A-10-184** Using an Organotypic Model for Simulating Axonal Strain During Traumatic Brain Injury EventsJ-P. DOLLE¹, R. SCHLOSS¹, AND M. L. YARMUSH¹¹Rutgers University, Piscataway, NJ

PS-7A-10-185 An Open-Surface Micro-Dispenser Valve for the Local Stimulation of Conventional Tissue CulturesC. G. SIP¹, AND A. FOLCH¹¹University of Washington, Seattle, WA**PS-7A-10-186** A Microfluidic Device Using a Permeation-Based Pump for Bacterial Cell Entrapment, Alignment and GrowthD. KIM¹, P. CULLEN², P. WIGGINS², AND S. FRADEN¹¹Brandeis University, Waltham, MA, ²MIT, Cambridge, MA**PS-7A-10-187** A Mechanical Device for Long-Duration Immobilization and Microscopy of Cells and Small OrganismsL. JIANG¹, J. B. ROBERTSON¹, AND C. JANETOPOULOS¹¹Vanderbilt 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. GODIN¹, J. ANANTA², R. SETHI³, S. FERRATI¹, R. E. SERDA¹, X. LIU¹, R. KRISHNAMURTHY³, R. MUTHUPILLAI³, M. FERRARI^{1,4}, L. J. WILSON², AND P. DECUZZI¹¹The University of Texas Health Science Center- Houston, Houston, TX, ²Rice University, Houston, TX, ³St. Luke's Episcopal Hospital, Houston, TX, ⁴MD Anderson Cancer Center, Houston, TX**PS-7A-11-189** Colon Cancer Stem Cell Microarrays for Screening Signaling Pathway InhibitorsM. R. CARSTENS¹, A. ACHARYA¹, E. HUANG¹, AND B. G. KESELOWSKY¹¹University of Florida, Gainesville, FL**PS-7A-11-190** Stabilization of Trivalent Inactivated Polio Vaccine for Microneedle VaccinationW. C. EDENS¹, N. DYBDAHL-SISSOKO², M. A. PALLANSCH², S. OBERSTE², AND M. R. PRAUSNITZ¹¹Georgia Institute of Technology, Atlanta, GA, ²Centers for Disease Control and Prevention, Atlanta, GA**PS-7A-11-191** Synthesis of Size-tunable Protein-gold Nanoparticle AggregatesA. ALBANESE¹, AND W. C. CHAN¹¹University of Toronto, Toronto, Ontario, Canada**PS-7A-11-192** Decreasing Biofilm Formation Through the Use of Magnetic NanoparticlesE. N. TAYLOR¹, AND T. J. WEBSTER¹¹Brown University, Providence, RI**PS-7A-11-193** CANCELED**PS-7A-11-194** Cavitation Forces in Cell Suspension: Application to Drug DeliveryJ. LAUTZ¹, G. SANKIN¹, F. YUAN¹, AND P. ZHONG¹¹Duke University, Durham, NC**PS-7A-11-195** High Transition Temperature Hyperbranched and Dendritic pNIPAAm Synthesis for Targeted Drug DeliveryK. CHANG¹, L. A. BERGMAN¹, AND L. J. TAITE¹¹Georgia Institute of Technology, Atlanta, GA**PS-7A-11-196** Daily Liquid Antiretroviral Pouch for PMTCT in Resource-Constrained SettingsC. GAMACHE¹, AND R. MALKIN¹¹Duke University, Durham, NC**PS-7A-11-197** Characterization of Nanoimprinted Shape-specific, Disease-responsive Drug CarriersM. E. CALDORERA-MOORE¹, M. KANG¹, V. SINGH¹, Z. MOORE¹, R. AGARWAL¹, P. JURNEY¹, R. HUANG¹, S. SREENIVASAN¹, L. SHI¹, AND K. ROY¹¹University of Texas at Austin, Austin, TX**PS-7A-11-198** Thermally-responsive Polymer-nanoshells Composites for Controlled Drug DeliveryL. STRONG¹, S. SERSHEN¹, AND J. WEST¹¹Rice University, Houston, TX**PS-7A-11-199** Polyvinyl Alcohol-coated Nanoparticles are Extensively Trapped in Fresh Human Mucus *Ex Vivo*M. YANG¹, S. K. LAI¹, Y-Y. WANG¹, C. HAPPE¹, C. SO¹, M. ZHANG¹, AND J. S. HANES¹¹The Johns Hopkins University, Baltimore, MD**PS-7A-11-200** A Study of Drug Release from Homogeneous PLGA MicrostructuresK. S. HANSEN¹¹Purdue University, West Lafayette, IN**PS-7A-11-201** Biodegradable Nanoparticles Decorated with Folate as a Targeted Anticancer TherapeuticA. J. DITTO¹, N. K. ROBBISHAW¹, M. J. PANZNER¹, W. J. YOUNGS¹, AND Y. H. YUN¹¹University of Akron, Akron, OH**PS-7A-11-202** Novel Photovoltaic Device-Based Drug Delivery System for Targeted Cancer ChemotherapyS. AMBURE¹, D. TERREROS², AND T. XU^{1,2}¹University of Texas at El Paso, El Paso, TX, ²Texas Tech University Health Sciences Center, El Paso, TX**PS-7A-11-203** Kinetic Swelling Responses of Iron Oxide/Hydrogel NanocompositesB. V. SLAUGHTER¹¹The University of Texas at Austin, Austin, TX**PS-7A-11-204** Fabrication of PEGylated Double-Walled Nanospheres By Solvent EvaporationD. Y. CHO¹, L. D. PATEL¹, AND E. MATHIOWITZ¹¹Brown University, Providence, RI**PS-7A-11-205** Size Effects of Polymer-nanoparticles Systems in Magnetic HyperthermiaO. T. MEFFORD¹, S. L. SAVILLE¹, B. QI¹, AND R. WADHWA¹¹Clemson 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. VIZUETE¹, S. PILLAY², B. J. MCCALLUM², K. M. ROPELLA¹, AND A. G. HUDETZ²¹Marquette University, Milwaukee, WI, ²Medical 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. PARK¹, Y-K. SONG², D. A. BORTON¹, W. R. PATTERSON¹, M. YIN¹, J. ACEROS¹, AND A. V. NURMIKKO¹¹Brown University, Providence, RI, ²Seoul National University, Suwon-si, Gyeonggi-do, Korea, Republic of**PS-7A-12-208** An Integrated Low-power and Low-noise Pre-amplifier for a High-density Neural Recording InterfaceJ. KIM¹, AND H. C. KIM¹¹UC Santa Cruz, Santa Cruz, CA

PS-7A-12-209 Evaluation of a Neural Spike Sorting Package Implemented in MATLABN. B. LANGHALS¹, K. A. LUDWIG¹, AND D. R. KIPKE¹¹University of Michigan, Ann Arbor, MI**PS-7A-12-210** Development of a Custom Artificial Intelligence Model for Functional Upper Extremity Neuroprosthetic ControlD. E. NATHAN¹, AND D. C. JEUTTER¹¹Marquette 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. ALAGAPAN¹, L. PAN¹, B. WHEELER¹, AND T. DEMARSE¹¹University 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. DOYLE¹, H. PATEL¹, J. B. GOODRICH¹, S. KWON¹, AND B. J. AMBROSE¹¹Utah 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. SONG¹, AND K. R. DILLER¹¹The 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. HOLTON¹, M. WALSH¹, AND R. BHARGAVA¹¹University of Illinois, Urbana, IL**PS-7A-14-215** Directing the Angiogenic Shift in Cancer Cells *In Vitro* Using a Tissue Engineering ApproachC. S. SZOT¹, C. F. BUCHANAN¹, M. N. RYLANDER¹, AND J. W. FREEMAN¹¹Virginia Polytechnic Institute and State University, Blacksburg, VA**PS-7A-14-216** Gold Nanoparticles With Chitosan Coatings for Laser Ablation of Hepatocellular Carcinoma CellsG. ZHANG¹, AND A. M. GOBIN¹¹University of Louisville, Louisville, KY**PS-7A-14-217** Regulation of Growth Factor-Dependent Tumor Cell Proliferation by Extracellular Matrix MechanicsT. A. ULRICH^{1,2}, V. UMESH¹, AND S. KUMAR^{1,2}¹University of California, Berkeley, Berkeley, CA, ²UCSF/UC Berkeley Joint Graduate Group in Bioengineering, Berkeley, CA**PS-7A-14-218** Comparative Evaluation of Transitional Cell Carcinoma TreatmentsX. ZHANG¹, AND W. T. GODBEY¹¹Tulane University, New Orleans, LA**PS-7A-14-219** Evaluation of CTC Transfection with Ab-Conjugated Nanoliposomes Under Microvascular Flow ConditionsR. HAROUAKA¹, C-Y. CHUNG², G. ROBERTSON^{2,3}, AND S. ZHENG^{1,2}¹The Pennsylvania State University, University Park, PA, ²The Pennsylvania State University Cancer Institute, Hershey, PA, ³The Pennsylvania State University College of Medicine, Hershey, PA**PS-7A-14-220** Role of β -catenin Gene Expression in Colon Cancer Cell Adhesion and GrowthS. AGASTIN¹, AND M. KING¹¹Cornell University, Ithaca, NY**PS-7A-14-221** Nitric Oxide Synthases Regulate Mouse Collecting Lymphatic Vessel ContractionS. LIAO¹, G. CHENG¹, L. L. MUNN¹, D. FUKUMURA¹, R. K. JAIN¹, AND T. P. PADERA¹¹Massachusetts General Hospital, Boston, MA**PS-7A-14-222** The Thermal Dose Concept and Quantitative Predictions of Thermal DamageJ. A. PEARCE¹¹The University of Texas at Austin, Austin, TX**PS-7A-14-223** Protease-Activated Quantum Dot Probes to Assess Invasiveness of Cancer CellsN. J. ROHANI¹, H. ZHU¹, R. A. DREZEK¹, V. L. COLVIN¹, AND J. L. WEST¹¹Rice University, Houston, TX**PS-7A-14-224** Naturally Derived Ivy Nanoparticles as an Alternative to Metal-based Nanoparticles for UV Protection in Cancer PreventionL. XIA¹, S. LENAGHAN¹, M. ZHANG¹, Z. ZHANG¹, AND Q. LI¹¹University of Tennessee, Knoxville, TN**PS-7A-14-225** Divergent Roles for CD44 and Carcinoembryonic Antigen in Colon Carcinoma MetastasisM. DALLAS¹, G. LIU², S. THOMAS³, D. HUSO², AND K. KONSTANTOPOULOS¹¹Johns Hopkins University, Baltimore, MD, ²Johns Hopkins Medical Institutions, Baltimore, MD, ³École 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. SAIK¹, B. J. GILL^{2,3}, D. L. GIBBONS⁴, J. M. KURIE⁴, AND J. L. WEST²¹Rice University, Houston, TX, ²Rice University, Houston, TX, ³Baylor College of Medicine, Houston, TX, ⁴MD Anderson Cancer Center, Houston, TX**PS-7A-14-227** Engineering 3D Microscale Niches for Studies of Oxygen-Dependent Tumor AngiogenesisS. S. VERBRIDGE¹, N. CHOI¹, Y. ZHENG¹, D. BROOKS¹, R. WILLIAMS¹, A. STROOCK¹, AND C. FISCHBACH¹¹Cornell University, Ithaca, NY**PS-7A-14-228** Treatment Planning of Irreversible Electroporation for Intracranial DisordersP. A. GARCIA¹, J. H. ROSSMEISL, JR.², AND R. V. DAVALOS¹¹Virginia Tech - Wake Forest, Blacksburg, VA, ²Virginia Tech, Blacksburg, VA**PS-7A-14-229** Engineering Non-immunogenic Second Generation L-Asparaginase for Acute Lymphoblastic Leukemia TherapyJ. CANTOR¹, T. YOO¹, E. STONE¹, AND G. GEORGIU¹¹University 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. SHERER¹, S. AMBEDKAR², S. PERNG², Y. YIH², AND T. F. IMPERIALE^{1,3}¹Roudebush VAMC, Indianapolis, IN, ²Purdue University, West Lafayette, IN, ³Indiana 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. SHANK¹, G. KOZLOWSKI¹, I. E. PAVEL¹, D. P. WOOLEY¹, A. O. SHEETS¹, K. WEAVER¹, AND A. M. BERENQUER²¹Wright State University, Dayton, OH, ²University 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^{1,2}, L. YANG², AND A. H. HSIEH^{1,3}¹University of Maryland, College Park, MD, ²Chongqing University, Chongqing, Chongqing, China, People's Republic of, ³University 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. QADRI¹, E. BERNSTEIN¹, AND D. PETERSON¹¹University 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. ALLEN¹, S. B. ADAMS¹, B. A. MATA¹, M. GABR¹, P. Y. HWANG¹, AND L. A. SETTON¹¹Duke University, Durham, NC**PS-7A-16-235** Cortical and Compact Bone Models From Clinical CT: Methods for Cortical Thickness ReconstructionD. P. MORENO^{1,2}, D. L. CROUCH^{1,2}, F. S. GAYZIK^{1,2}, AND J. D. STITZEL^{1,2}¹Wake Forest University School of Medicine, Winston-Salem, NC, ²Virginia 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. SOUZANCHI¹, L. CARDOSO¹, AND S. C. COWIN¹¹City 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 IV¹, AND D. P. GAVER III¹¹Tulane University, New Orleans, LA**PS-7A-17-238** Inhibitory Effects of Albumin on Dynamic Surface Tension Characteristics of Pulmonary SurfactantB. D. FOWLER¹, E. YAMAGUCHI¹, AND D. P. GAVER¹¹Tulane University, New Orleans, LA**PS-7A-17-239** Alveolar Inflation Mechanics Following Elastase DegradationC. E. PERLMAN¹¹Stevens Institute of Technology, Hoboken, NJ**PS-7A-17-240** Quantitative Histology of Contused Lung Tissue with Comparison to Computed TomographyF. S. GAYZIK^{1,2}, J. J. HOTH¹, AND J. D. STITZEL^{1,2}¹Wake Forest University School of Medicine, Winston-Salem, NC, ²Virginia 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. SHIEH¹, AND J. A. ZASADZINSKI¹¹University of California, Santa Barbara, CA**PS-7A-17-242** The Correlation Between Rib Fractures and Pulmonary ContusionsB. FRY¹, E. S. KIM², W. FRY¹, AND H. C. GABLER²¹Carilion Clinic, Roanoke, VA, ²Virginia 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. YAMAGUCHI¹, B. J. SMITH¹, B. D. FOWLER¹, AND D. P. GAVER¹¹Tulane University, New Orleans, LA**PS-7A-18-244** Design of a Device for Mechanical Stimulation of Tissue-Engineered ConstructsJ. IMSIROVIC¹, K. VO¹, K. DERRICKS², C. RICH², M. NUGENT^{1,2}, AND B. SUKI¹¹Boston University, Boston, MA, ²Boston 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. LEE¹, AND E. O. VOIT¹¹Georgia Institute of Technology, Atlanta, GA**PS-7A-19-246** In Vitro Evolution of Streptavidin in the Presence of an Unnatural Amino AcidA. SINGH¹¹University 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. ASKARI¹, AND D. WON¹¹California 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. KIM¹, AND J. S. KIM¹¹University 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^{1,2}, G. W. MILLER², AND E. O. VOIT^{1,2}¹GIT, Atlanta, GA, ²Emory, Atlanta, GA

PS-7A-20-251 Ankle Stiffness Control During Quiet Standing versus Active Sensory Feedback Control with DelayA. MAHBOOBIN¹, M. CENCIARINI¹, M. REDFERN¹, AND P. LOUGHLIN¹
¹University of Pittsburgh, Pittsburgh, PA**PS-7A-20-252** Computational Study of RF Effect of Mobile Phones and Its Biological Effect on Brain CancerS. GOGINENI¹, A. NORDQUIST¹, AND Y. FENG¹
¹University of Texas at San Antonio, San Antonio, TX**PS-7A-20-253** The Role of Cholesterol in Alzheimer's disease Pathogenesis: Preliminary ReportC. KYRTSOS¹, AND J. S. BARAS¹
¹University of Maryland, College Park, MD**PS-7A-20-254** Effects of a HIFU-Simulated Blast Pulse Train on a Simple Neural ModelR. ABDUL WAHAB^{1,2}, M. CHOI², V. ZDERIC², AND M. R. MYERS³
¹US FDA, Silver Spring, MD, ²George Washington University, Washington, DC, ³US 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. BLANCHETTE¹, P. PACHECO², Y. WOO³, N. SHEN¹, A. HIDDESEN¹, AND T. SULCHEK²
¹Lawrence Livermore National Lab, Livermore, CA, ²Georgia Tech, Atlanta, GA, ³Lawrence Berkeley National Lab, Berkeley, CA**PS-7A-21-256** Ultra-Rapid Purification of Type I Collagen for Bioengineering ApplicationsC. A. PACAK¹, J. M. POWERS¹, AND D. B. COWAN¹
¹Children'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. SKILES¹, J. BLANCHETTE¹, R. FANCY¹, AND N. WILDER¹
¹University 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. RAMAMURTHY¹, T. ROTH¹, F. EBISU¹, AND K. BARALD¹
¹University of Michigan, Ann Arbor, MI**PS-7A-21-259** I3C NMR and Isotopomeric Analysis for Metabolic Studies of Cryopreserved Pancreatic SubstitutesH. AHMAD^{1,2}, A. LAWSON^{1,2}, N. SIMPSON³, AND A. SAMBANIS^{1,2}
¹Georgia Institute of Technology, Atlanta, GA, ²Georgia Tech/Emory Center for the Engineering of Living Tissues, Atlanta, GA, ³University of Florida, Gainesville, FL**PS-7A-21-260** The Use of Perfluorocarbons to Noninvasively Monitor the Microenvironment of Engineered TissuesF. GOH^{1,2}, R. LONG^{2,3}, N. SIMPSON⁴, AND A. SAMBANIS^{1,2}
¹Georgia Institute of Technology, Atlanta, GA, ²Georgia Tech-Emory Center for the Engineering of Living Tissues, Atlanta, GA, ³Emory University School of Medicine, Atlanta, GA, ⁴University of Florida, Gainesville, FL**PS-7A-21-261** Effect of Endothelial Cell and Osteoblast Co-culture Ratios on Angiogenesis and MineralizationA. R. SHAH^{1,2}, J. C. WENKE², AND C. M. AGRAWAL¹
¹University of Texas at San Antonio, San Antonio, TX, ²US 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^{1,2}, G. PINS¹, T. DOMINKO¹, AND R. PAGE^{1,2}
¹Worcester Polytechnic Institute, Worcester, MA, ²Cellthera, Inc, Southbridge, MA**PS-7A-21-264** Derivation of Cardiac Progenitors from Induced Pluripotent Stem Cells for Cardiac Tissue EngineeringS. CHAKRABORTY¹, N. CHRISTOFOROU¹, AND K. LEONG¹
¹Duke 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. HAYDEN¹, AND D. L. KAPLAN¹
¹Tufts University, Medford, MA**PS-7A-22-266** FE Modeling of MREM. HAGHPANAHI¹
¹Iran 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. BARON¹, K. D. ALLEN¹, P. BONALDO², F. GUILAK¹, AND L. A. SETTON¹
¹Duke University, Durham, NC, ²Universita degli Studi di Padova, Padova, Padova, Italy**PS-7A-22-268** Investigating Glioblastoma Behavior in 3D Culture Using Hydrogel BiomaterialsS. S. RAO¹, S. BENTIL¹, J. DEJESUS¹, J. LARISON¹, R. DUPAIX¹, A. SARKAR¹, AND J. O. WINTER¹
¹The Ohio State University, Columbus, OH**PS-7A-22-269** Modeling of Brain White Matter under Blast LoadingA. SUNDARAMURTHY¹, AND N. CHANDRA¹
¹University 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. HAGHPANAHI¹
¹Iran 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. SHREIBER¹, M. JULIAS¹, AND H. M. BUETTNER¹
¹Rutgers, 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. SONG¹, P. ZANDSTRA¹, AND M. RADISIC¹
¹University of Toronto, Toronto, ON, Canada**PS-7A-22-274** Apoptosis Resistance of Multicellular Spheroids in Three-Dimensional Polymeric ScaffoldsJ. W. KIM¹, W. J. HO¹, AND B. WU¹
¹University of California Los Angeles, Los Angeles, CA**PS-7A-22-275** Towards an *Ex Vivo* Model of Lesion Formation in EndometriosisN. DOYLE^{1,2}, M. T. BESTE^{1,2}, B. A. JOUGHIN^{1,3}, D. A. LAUFFENBURGER^{1,2}, K. B. ISAACSON^{2,4}, AND L. G. GRIFFITH^{1,2}
¹Department for Biological Engineering, MA Institute of Technology, Cambridge, MA, ²Center for Gynecopathology Research, Massachusetts Institute of Technology, Cambridge, MA, ³David H. Koch Institute for Integrative Cancer Research, Massachusetts Institute of Technology, Cambridge, MA, ⁴Minimally 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. LAI¹, AND K. LEE¹¹Tufts 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. BELLAS¹, B. PANILALITIS¹, K. MARRA², J. RUBIN², J. J. YOO³, AND D. L. KAPLAN¹¹Tufts University, Medford, MA, ²University Of Pittsburgh, Pittsburgh, PA, ³WFIRM, Winston-Salem, NC**PS-7A-23-278** Determination of Diffusion Coefficients in Calcium Alginate PhantomsZ. MONTGOMERY¹, R. HOOD¹, AND C. RYLANDER¹¹Virginia Tech, Blacksburg, VA**PS-7A-23-279** Development of a Vascularized Dermal Equivalent using Adipose Derived Stem CellsS. NATESAN¹, G. ZHANG², T. J. WALTERS¹, L. J. SUGGS³, AND R. J. CHRISTY¹¹USASIR, Fort Sam Houston, TX, ²University of Akron, Akron, OH, ³University of Texas at Austin, Austin, TX**PS-7A-23-280** Epidermal Differentiation Governs Engineered Skin BiomechanicsG. C. EBERSOLE¹, P. M. ANDERSON¹, AND H. M. POWELL¹¹Ohio 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^{1,2}, M. D. BRIGHAM^{1,2}, AND K. K. PARKER^{1,2}¹Disease Biophysics Group, School of Engineering and Applied Sciences, Harvard University, Cambridge, MA, ²Wyss Institute for Biologically Inspired Engineering, Harvard University, Boston, MA**PS-7A-24-282** Use of a Thermoresponsive Polymer to Fabricate Uniform Tumor ModelsJ. A. REED¹, J. P. FREYER¹, AND H. E. CANAVAN¹¹University of New Mexico, Albuquerque, NM**PS-7A-24-283** 3D *In Vitro* Liver Tissue Model System: HEPG2 Liver cells in 3D Alginate HydrogelsS-F. LAN¹, AND B. STARLY²¹University of Oklahoma, Norman, OK, ²University 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. BOWERS¹, S. TANNER¹, P. CHHABRA², K. L. BRAYMAN², AND E. A. BOTCHWEY¹¹University of Virginia, Charlottesville, VA, ²University of Virginia, Charlottesville, VA**PS-7A-25-285** Evaluation of Macroporous Silicone Scaffolds for Islet Transplantation within an Alternative SiteE. PEDRAZA¹, A-C. BRADY¹, A. PILEGGI¹, AND C. L. STABLER¹¹University of Miami, Miami, FL**PS-7A-25-286** A Red Blood Cell Aggregometer Using an Air-Pressure Driven Disaggregation MethodJ. PARK¹, Y. KANG¹, M. KIM¹, AND S. YANG¹¹GIST, Gwangju, Jeonla, Korea, Republic of**PS-7A-25-287** Improvement of Hematocrit Measurement Accuracy in a Microfluidic Impedance SystemM. SON¹, M. KIM¹, AND S. YANG¹¹GIST, Gwangju, Jeonnam, Korea, Republic of**PS-7A-25-288** Synergistic Interaction between Stress Waves and Cavitation in Stone Comminution during Shock Wave LithotripsyJ. LAUTZ¹, S. REISS¹, G. SANKIN¹, W. N. SIMMONS¹, AND P. ZHONG¹¹Duke 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. JONES¹, J. ZHU¹, AND R. E. MARCHANT¹
¹Case 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. HEARON¹, T. S. WILSON², AND D. J. MAITLAND¹
¹Texas A&M University, College Station, TX, ²Lawrence 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^{1,2}, S. M. DIRK¹, AND E. L. HEDBERG-DIRK²
¹Sandia National Laboratories, Albuquerque, NM, ²University 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. ZHANG¹, K. L. MOFFAT¹, X. S. LIU¹, B. ZHOU¹, X. GUO¹, AND H. H. LU¹
¹Columbia University, New York, NY

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

M. R. LADD^{1,2}, S. LEE², A. ATALA², AND J. J. YOO^{1,2}
¹Wake Forest/Virginia Tech, Winston Salem, NC, ²Wake 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^{1,2}, S. SANTI^{1,2}, AND A. KHADEMHOSEINI^{1,2}
¹Center for Biomedical Engineering, Brigham and Women's Hospital, Harvard Medical School, Cambridge, MA, ²Harvard-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. ANDREOZZI¹, AND A. LOUIE¹
¹University of California, Davis, Davis, CA

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

N. CAO¹, R. H. HUESMAN², W. W. MOSES², AND J. QI¹
¹University of California at Davis, Davis, CA, ²Lawrence Berkeley National Lab, Berkeley, CA

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

S. HOU¹, S. TONG¹, AND G. BAO¹
¹Georgia 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. ELIAS¹, AND A. TSOURKAS¹
¹University of Pennsylvania, Philadelphia, PA

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

X. HU¹, C. ANDERSON², J. RYCHAK², AND K. FERRARA¹
¹University of California, Davis, Davis, CA, ²Targeson, Inc, San Diego, CA

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

J. B. HAUN¹, N. K. DEVARAJ¹, H. LEE¹, AND R. WEISSLEDER¹
¹Massachusetts 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. ELIAS¹, AND A. TSOURKAS¹
¹University 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. TRUBY¹, K. A. HOMAN¹, M. QU¹, M. MEHRMOHAMMADI¹, AND S. EMELIANOV¹
¹The 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. TAM¹, T. YOKOYAMA², T. LARSON¹, A. SCOTT², S. KONDO², J. A. ROTH², R. RAMESH², AND K. V. SOKOLOV¹
¹University of Texas at Austin, Austin, TX, ²MD 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. BROOME¹, G. RAMAMURTHY¹, K. LAVIK¹, L. A. LIGGETT¹, AND J. P. BASILION¹
¹Case 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. PUVANAKRISHNAN¹, J. PARK¹, P. DIAGARADJANE², G. P. GOODRICH³, S. KRISHNAN², AND J. W. TUNNELL¹
¹The University of Texas at Austin, Austin, TX, ²The University of Texas M.D Anderson Cancer Center, Houston, TX, ³Nanospectra Biosciences Inc, Houston, TX

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

L. R. BICKFORD¹, AND R. A. DREZEK¹
¹Rice 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. PRASAD¹, AND M. SAHIN¹
¹New 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'DOHERTY¹, P. J. IFFT¹, K. Z. ZHUANG¹, M. A. LEBEDEV¹, AND M. A. NICOLELIS¹
¹Duke University, Durham, NC**11:00AM OP-7-1-4C** Decoding Functional Intention Using Near-infrared SpectroscopyT. CHAU^{1,2}, S. POWER¹, K. TAI², S. LIDDLE³, AND T. FALK²
¹University of Toronto, Toronto, Ontario, Canada, ²Bloorview Research Institute, Toronto, Ontario, Canada, ³Massachusetts General Hospital, Boston, MA**11:15AM OP-7-1-4D** Toward Artificial Proprioception: Closing the Loop Through Cortical StimulationB. M. LONDON¹, R. RUIZ TORRES¹, AND L. E. MILLER¹
¹Northwestern University, Chicago, IL**11:30AM OP-7-1-4E** Optimizing Intracortical Microstimulation Via Asymmetric PulsesA. KOIVUNIEMI¹, AND K. OTTO²
¹Purdue University, Indianapolis, IN, ²Purdue 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. ACHARYA¹, M. H. SCHIEBER², AND N. V. THAKOR¹
¹Johns Hopkins University, Baltimore, MD, ²University 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. LIU¹, S. VEGA¹, S. GORDONOV¹, J. KIM¹, AND P. V. MOGHE¹
¹Rutgers University, Piscataway, NJ**10:45AM OP-7-1-5B** Anisotropically Patterned Cardiac Tissue Displays Mature Ca²⁺ Handling *In Vitro*H. JIN¹, H. LEE¹, B. DABIRI¹, A. W. FEINBERG¹, AND K. K. PARKER¹
¹Wyss 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. SCHWELLER¹, AND M. DIEHL¹
¹Rice University, Houston, TX**11:15AM OP-7-1-5D** Membrane Remodeling in the Footprint of Arrested Neutrophils Revealed Using DTIRF MicroscopyP. SUND¹, E. GUTIERREZ², A. GROISMAN², AND K. LEY^{2,3}
¹La Jolla Institute for Allergy and Immunology, La Jolla, CA, ²University of California San Diego, La Jolla, CA, ³La 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. GIBBS¹, A. C. LEKVEN¹, AND A. T. YEH¹
¹Texas 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. GOWER¹, H. WU², C. M. BALLANTYNE², A. A. KNOWLTON¹, AND S. I. SIMON¹
¹University of California Davis, Davis, CA, ²Baylor 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. RODRIGUEZ¹
¹University of Washington, Seattle, WA**11:00AM OP-7-1-6C** Membrane Cholesterol and Ethanol Together Differentially Regulate Neutrophil Tethering and RollingM. FURLOW¹, AND S. DIAMOND¹
¹University of Pennsylvania, Philadelphia, PA**11:15AM OP-7-1-6D** Neutrophil Shear-Induced Resistance to Activation via the Formyl Peptide ReceptorM. J. MITCHELL¹, AND M. R. KING¹
¹Cornell University, Ithaca, NY**11:30AM OP-7-1-6E** Determination Of Threshold Forces For Tether Formation In VesiclesD. J. STARK¹, T. C. KILLIAN¹, AND R. M. RAPHAEL¹
¹Rice University, Houston, TX**11:45AM OP-7-1-6F** Characterization of Selectin-mediated Cell Binding Using the Micropatterning Technology and ModelingL. CHEUNG¹, Z. TONG¹, K. J. STEBE², AND K. KONSTANTOPOULOS¹
¹Johns Hopkins University, Baltimore, MD, ²University 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. VARNER¹, AND L. A. TABER¹
¹Washington University, Saint Louis, MO**10:45AM OP-7-1-7B** Computational Modeling of Eccentric and Concentric Cardiac Growth through SarcomerogenesisS. GOKTEPE¹, O. J. ABILEZ¹, K. K. PARKER², AND E. KUHL¹
¹Stanford University, Stanford, CA, ²Harvard University, Cambridge, MA**11:00AM OP-7-1-7C** Systems Analysis of the Cardiac Hypertrophy Signaling Network Using Automated ImagingK. A. RYALL¹, AND J. J. SAUCERMAN¹
¹University of Virginia, Charlottesville, VA**11:15AM OP-7-1-7D** Left Ventricular Wall Mechanics Improve During Endocardial Pacing In the Dyssynchronous Canine HeartE. J. HOWARD¹, J. W. COVELL¹, L. J. MULLIGAN², A. D. MCCULLOCH¹, J. H. OMENS¹, AND R. C. KERCKHOFFS¹
¹University of California, San Diego, La Jolla, CA, ²Medtronic Inc., Mounds View, MN

11:30AM OP-7-1-7E Diffusion Tensor MRI Mapping of Two Local Myocardial Sheet Orientations with Histological ValidationG. L. KUNG¹, T. C. NGUYEN², A. ITOH², S. SKARE², N. B. INGELS JR.², D. C. MILLER², AND D. B. ENNIS¹¹University of California, Los Angeles, CA, ²Stanford University, Stanford, CA**11:45AM OP-7-1-7F** Novel Papillary Muscle Force Transducer: Tests and ResultsJ. B. ASKOV^{1,2}, J. L. HONGE¹, M. O. JENSEN^{1,2}, H. NYGAARD^{1,2}, J. M. HASENKAM¹, AND S. L. NIELSEN¹¹Aarhus University Hospital, Aarhus N, Aarhus, Denmark, ²Engineering 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. ALFANO¹, S. K. NATARAJAN¹, AND H. MENG¹¹State 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. NIEBEL¹, K. STEWART¹, R. KUMAR², T. OHARA², P. VLACHOS¹, AND W. LITTLE²¹Virginia Tech, Blacksburg, VA, ²Wake 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. JEN¹, T. HSIAI¹, AND H. MOHAMED²¹University of Southern California, Los Angeles, CA, ²University of Utah, Salt Lake City, UT**11:15AM OP-7-1-8D** The Relationship Between Shear and Mass Transport in the Carotid Artery BifurcationR. GORDER¹, AND A. ALISEDA¹¹University of Washington, Seattle, WA**11:30AM OP-7-1-8E** Characterization of Pulsatile Flow in the Human Carotid Bifurcation with AgeW. JEONG¹, AND J. SEONG¹¹University of Central Oklahoma, Edmond, OK**11:45AM OP-7-1-8F** Pathological Shear Condition Alters Platelet Complement ActivationS. SHANMUGAVELAYUDAM¹, D. A. RUBENSTEIN¹, AND W. YIN¹¹Oklahoma 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. LIN¹, F. SERRA-HSU¹, S. FERRERI¹, J. CHENG¹, AND Y-X. QIN¹¹State 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. LEINWEBER¹, A. COCHRAN¹, AND Y. GAO¹¹Cornell 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. GU¹, D. J. LEONG^{1,2}, N. MALDONADO³, E. WILLIAMS³, H. B. SUN^{1,2}, AND L. CARDOSO¹¹The Graduate Center and The City College of The City University of New York, New York, NY, ²Mount Sinai School of Medicine, New York, NY, ³City 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. HUANG¹, AND E. A. BOTCHWEY¹¹University of Virginia, Charlottesville, VA**11:30AM OP-7-1-9E** Perineural Delivery of sTNFRII Attenuates Symptoms Associated with Lumbar Radiculopathy in the RatK. D. ALLEN¹, M. F. SHAMJI², B. A. MATA¹, M. GABR³, S. M. SINCLAIR¹, P. Y. HWANG¹, W. J. RICHARDSON¹, AND L. A. SETTON¹¹Duke University, Durham, NC, ²Ottawa Hospital, Ottawa, Ontario, Canada**11:45AM OP-7-1-9F** Response of Pain Receptors in the Midbrain due to Painful RadiculopathyP. Y. HWANG¹, M. F. SHAMJI², L. JING¹, M. GABR³, B. A. MATA³, K. D. ALLEN³, J. CHEN¹, W. J. RICHARDSON³, AND L. A. SETTON^{1,3}¹Duke University Department of Biomedical Engineering, Durham, NC, ²Division of Neurosurgery, Ottawa Hospital, Ottawa, ON, Canada, ³Duke 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. XIE¹, C-C. CHEN¹, L. PTASZEK², S. XIAO¹, X. CAO¹, L. HARRIS¹, C. COWAN², AND S. ZHONG¹¹University of Illinois at Urbana-Champaign, Urbana, IL, ²Massachusetts General Hospital, Boston, MA**10:45AM OP-7-1-10B** Ablation of HSV-1 Replication by Drug Combinations Developed through Feedback System ControlX. DING¹, D. J. SANCHEZ¹, A. SHAHANGIAN¹, G. CHENG¹, AND C-M. HO¹¹University of California, Los Angeles, Los Angeles, CA**11:00AM OP-7-1-10C** Data-Driven Modeling Enhances Oncolytic Adenovirus TherapyN. BAGHERI¹, M. SHIINA², W. M. KORN², AND D. LAUFFENBURGER¹¹MIT, Cambridge, MA, ²UCSF, San Francisco, CA**11:15AM OP-7-1-10D** Adaptive Model Predictive Control of Human Promyelocytic Leukemia Cell DifferentiationS. L. NOBLE¹, AND A. E. RUNDELL¹¹Purdue 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^{1,2}, AND D. V. SCHAFFER²¹Yale University, New Haven, CT, ²UC Berkeley, Berkeley, CA

11:45AM OP-7-1-10F Measurements and Computational Modeling of Cerebrospinal Fluid Flow in HumansB. J. SWEETMAN¹, A. A. LINNINGER¹, AND R. PENN¹
¹University 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. CHIRASATITSIN¹, AND A. J. ENGLER¹
¹University of California, San Diego, La Jolla, CA**10:45AM OP-7-1-12B** Oxygen Gradients for Open Well Cellular Cultures via Microfluidic SubstratesJ. LO¹, AND D. T. EDDINGTON¹
¹University of Illinois, Chicago, IL**11:00AM OP-7-1-12C** Patterning Cells Over Diamond-Like Carbon Electrochemical Electrodes Using Parylene C MicrowellsJ. Yao^{1,2}, C. J. Mathai¹, S. Gangopadhyay¹, and K. D. Gillis^{1,2}
¹University of Missouri, Columbia, MO, ²Dalton 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. LEI¹, J. TIAN¹, J. MOHARIL¹, P. XU¹, C. P. SCHAFFER¹, AND S. T. ANDREADIS^{1,2}
¹University at Buffalo-SUNY, Amherst, NY, ²Center 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. RETTIE¹, T. CHANG¹, W. C. WATT¹, AND A. FOLCH¹
¹University of Washington, Seattle, WA**11:45AM OP-7-1-12F** Identification of Angiogenic Factors Through Reconfigurable Co-CulturesM. Y. KIM¹, A. C. NEWMAN¹, K. M. SPENCER¹, P. H. CHAO¹, K. L. DOOLEY¹, C. C. HUGHES¹, AND E. E. HUI¹
¹University 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. BARUA¹, J. RAMOS¹, J. LEHRMAN¹, AND K. REGE¹
¹Arizona State University, Tempe, AZ**10:45AM OP-7-1-13B** Intracellular Transport of Linear-Dendritic Block Copolymer DNA Polyplexes: Characterization and ModulationD. BONNER¹, C. LEUNG¹, R. LANGER¹, AND P. HAMMOND¹
¹MIT, Cambridge, MA**11:00AM OP-7-1-13C** Self-Assembling DNA Nanostructures: Novel Carriers for Drug DeliveryH. LI¹, Y-P. HO¹, T. LABEAN², AND K. LEONG¹
¹Department of Biomedical Engineering, Duke University, Durham, NC, ²Department 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. FIELDS¹, C. CHENG¹, C. HOIMES¹, T. PATEL¹, M. EGAN¹, AND W. M. SALTZMAN¹
¹Yale 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. PADMASHALI¹, AND S. ANDREADIS¹
¹University 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. BERGEN¹, AND D. V. SCHAFFER¹
¹UC 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 Repertoires

S. T. REDDY¹, X. GE¹, AND G. GEORGIU¹
¹University of Texas Austin, Austin, TX

10:45AM OP-7-1-14B Palmitoylation Regulates Raft Affinity for the Majority of Cell Surface Proteins

I. LEVENTAL¹, D. LINGWOOD¹, AND K. SIMONS¹
¹Max Planck Institute for Cell Biology and Genetics, Dresden, Germany

11:00AM OP-7-1-14C Designing Synthetic, Modular Peptide Antigen Delivery Systems Using Self-Assembling Peptide Amphiphiles

A. TRENT¹, M. BLACK¹, AND M. TIRRELL²
¹University of California, Santa Barbara, Berkeley, CA, ²University of California, Berkeley, Berkeley, CA

11:15AM OP-7-1-14D High-Throughput Sequencing: Antibody Repertoire Development in Zebrafish

N. JIANG¹, J. WEINSTEIN¹, L. PENLAND¹, R. WHITE III¹, D. FISHER¹, AND S. QUAKE¹
¹Stanford University, Stanford, CA

11:30AM OP-7-1-14E Controlled Antigen Release in Mucosa for Oral Vaccination

T. A. KHAN¹, AND J. A. MAYNARD¹
¹The University of Texas at Austin, Austin, TX

11:45AM OP-7-1-14F Novel Methods for the Discovery of Highly Potent Therapeutic Antibodies

X. GE¹, AND G. GEORGIU¹
¹University 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 Cells

A. CONWAY¹, R. ASHTON¹, AND D. V. SCHAFFER¹
¹University of California, Berkeley, Berkeley, CA

10:45AM OP-7-1-15B Multivalency Enhances the Potency of Sonic Hedgehog in Dopaminergic Differentiation of hESCs

R. S. ASHTON¹, J. POLLOCK¹, K. HEALY¹, R. S. KANE², AND D. V. SCHAFFER¹
¹University of California Berkeley, Berkeley, CA, ²Rensselaer Polytechnic Institute, Troy, NY

11:00AM OP-7-1-15C Bioactive and Protein-like Synthetic Nanostructures From Peptide Amphiphiles

W. SUH¹, G. D. STUCKY², AND M. V. TIRRELL¹
¹University of California, Berkeley, Berkeley, CA, ²University of California, Santa Barbara, Santa Barbara, CA

11:15AM OP-7-1-15D Synergistic Effect of Anisotropic Adhesive Cues on Neurite Outgrowth

S. N. MASAND¹, H. SUNDARARAGHAVAN², AND D. SHREIBER¹

¹Rutgers, The State University of New Jersey, Piscataway, NJ, ²The University of Pennsylvania, Philadelphia, PA

11:30AM OP-7-1-15E Guided Assembly of Insulin-Expressing Islet-Like Cell Clusters on Polymeric Micro/Nanowells

D. GALLEGOS-PEREZ¹, N. HIGUITA-CASTRO¹, R. REEN¹, M. PALACIO OCHOA^{1,2}, S. SHARMA¹, L. LEE¹, J. LANNUTTI¹, D. HANSFORD¹, AND K. GOOCH¹

¹The Ohio State University, Columbus, OH, ²Antioquia School of Engineering, Envigado, Antioquia, Colombia

11:45AM OP-7-1-15F Optimization of Nano-scale Perfluorocarbon Emulsions for use in Cellular Encapsulation

C. FRAKER¹, AND C. L. STABLER¹
¹University 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 Mater

P. B. SNOWHILL¹, R. D. HUBBARD¹, P. K. ALKEMA¹, AND G. J. POMRINK¹
¹Integra LifeSciences, Plainsboro, NJ

10:45AM OP-7-1-16AB Glycomimetic Functionalized Scaffolds for Peripheral Nerve Regeneration

S. N. MASAND¹, B. HAMMERLING¹, I. PERRON², J. CHEN¹, M. SCHACHNER¹, AND D. SHREIBER¹

¹Rutgers, The State University of New Jersey, Piscataway, NJ, ²Rutgers, The State University of New Jersey, Philadelphia, NJ

11:00AM OP-7-1-16C Injection of Schwann Cells into Acellular Cold-Preserved Nerve Grafts to Enhance Nerve Regeneration

N. JESURAJ¹, K. SANTOSA², M. MACEWAN^{1,2}, A. MOORE², R. KASUKURTHI², W. RAY², E. FLAGG², D. HUNTER², G. BORSCHEL^{2,3}, P. JOHNSON², S. MACKINNON², AND S. SAKIYAMA-ELBERT¹
¹Washington University in St. Louis, St. Louis, MO, ²Washington University School of Medicine, St. Louis, MO, ³University of Toronto, Toronto, Ontario, Canada

11:15AM OP-7-1-16AD Hydrolytically Degradable Poly(ethylene glycol) Hydrogel as a Tunable Scaffold for Neural Tissue Engineering

S. P. ZUSTIAK¹, AND J. B. LEACH¹
¹UMBC, Chemical & Biochemical Engineering, Baltimore, MD

11:30AM OP-7-1-16E Hyaluronic Acid Scaffolds for Repair Strategies after Cervical Spinal Cord Injury

Z. Z. KHAING¹, S. GEISSLER¹, S. V. AGUILAR¹, T. SCHALLERT¹, AND C. E. SCHMIDT
¹UT Austin, Austin, TX

11:45AM OP-7-1-16F Mouse Embryonic Stem Cell-derived Progenitor Motor Neurons for Transplantation After Spinal Cord Injury

D. MCCREEDY¹, AND S. SAKIYAMA-ELBERT¹
¹Washington 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. THOMAS¹, A. G. BURBANK¹, AND C. K. KUO¹¹Tufts University, Medford, MA**10:45AM OP-7-1-17B** Selective Activation of Phospholipid Receptors Affects Progenitor Cell RecruitmentM. R. TINIU¹, AND E. A. BOTCHWEY¹¹University of Virginia, Charlottesville, VA**11:00AM OP-7-1-17C** Bone Marrow Stromal Cell Recruitment Enhances Local SIP Receptor-Initiated Vascular RemodelingA. O. AWOJODU¹, L. S. SEFCIK¹, B. R. WAMHOFF², S. M. PEIRCE-COTTLER¹, AND E. A. BOTCHWEY¹¹University of Virginia - Department of Biomedical Engineering, Charlottesville, VA, ²University 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. CHENG¹, R. HARBUCK¹, Y. EL-ABD¹, W. E. KRAUS², AND G. A. TRUSKEY¹¹Duke University, Durham, NC, ²Duke University Medical Center, Durham, NC**11:30AM OP-7-1-17E** Contractile Force of Engineered Skeletal Muscle Depends on Myofiber Density and Local AlignmentW. BIAN¹, AND N. BURSAC¹¹Duke University, Durham, NC**11:45AM OP-7-1-17F** Functional Restoration of Skeletal Muscle Defects Using Bioengineered Skeletal Muscle in RodentsM. MACHINGAL^{1,2}, B. T. CORONA¹, V. KESIREDDY¹, W. ZHAO¹, J. J. YOO¹, AND G. J. CHRIST¹¹Wake Forest Institute for Regenerative Medicine, Winston Salem, NC, ²VT-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. JAHNSEN¹, P. DALE¹, AND G. SCHELLER¹¹University 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. STABENFELDT¹, A. EISEN², AND D. C. EATON²¹Georgia Institute of Technology / Emory University, Atlanta, GA, ²Emory 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. RAMOS¹, A. VARGAS¹, F. ALISTER¹, F. SAHLI¹, AND M. CAMPOS¹¹Pontificia 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^{1,2}, J. WYLIE-SEARS³, J. BISCHOFF^{3,4}, E. AIKAWA^{4,5}, R. A. LEVINE^{4,6}, AND K. K. PARKER^{1,2}¹Disease Biophysics Group, School of Engineering and Applied Sciences, Harvard University, Cambridge, MA, ²Wyss Institute for Biologically Inspired Engineering, Harvard University, Boston, MA, ³Children's Hospital Boston, Boston, MA, ⁴Harvard Medical School, Boston, MA, ⁵Brigham and Women's Hospital, Boston, MA, ⁶Massachusetts General Hospital, Boston, MA**PS-7B-3-6** High Contrast MicroCT Imaging of Coronary Arteries with Vulnerable Plaque for Biomechanical ModelingA. A. KELLY¹, N. MALDONADO¹, S. CHAKRABORTI¹, Y. VENGRENYUK², L. CARDOSO¹, AND S. WEINBAUM¹¹City College of New York, New York, NY, ²New York University, New York, NY**PS-7B-3-7** Postprandial Triglyceride-Rich Lipoproteins Differentially Modulate Vascular Endothelial Cell Inflammatory ResponsesY. I. WANG¹, J. SCHULZE¹, S. I. SIMON¹, AND A. G. PASSERINI¹¹University 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. NEHILLA¹, N. PETUKHOV², AND J. L. MCGRATH¹¹University of Rochester, Rochester, NY, ²Webster High School, Webster, NY**PS-7B-4-9** Image-based Quantification of Vascular Network Development Within a Perfusion CircuitJ. A. RYTLEWSKI¹, L. GEUSS¹, AND L. J. SUGGS¹¹UT Austin, Austin, TX**PS-7B-4-10** Fibronectin Polymerization and Actin Polarization Drive VasculogenesisJ. P. CALIFANO¹, AND C. A. REINHART-KING¹¹Cornell University, Ithaca, NY**PS-7B-4-11** Modeling the Angiogenic Response of the Neurovasculature in IschemiaR. REKHI¹, A. AREVALOS¹, J. JUNG¹, B. LONG¹, AND A. A. QUTUB¹¹Rice University, Houston, TX**PS-7B-4-12** Fibril Alignment Improves Microvasculature Formation by Human Blood Outgrowth Endothelial Cells in Fibrin GelK. T. MORIN¹, AND R. T. TRANQUILLO¹¹University of Minnesota, Minneapolis, MN**PS-7B-4-13** - Impact of Extracellular Matrix Stiffness on Angiogenic PatterningP-F. LEE¹, K. J. BAYLESS¹, AND A. T. YE¹¹Texas A&M University, College Station, TX**PS-7B-4-14** Tissue Stiffness and Microvascularized Tissue DevelopmentA-C. LIN¹, AND C. MILLER¹¹Saint Louis University, St Louis, MO**PS-7B-4-15** Gradient Deposition of Growth Factors Via Electrospinning for Precise Spatiotemporal Angiogenic TherapiesR. B. MONTERO¹, AND F. M. ANDREOPOULOS¹¹University of Miami, Coral Gables, FL**PS-7B-4-16** Modulation of NO Bioavailability by Red Blood Cells in MicrocirculationP. DEONIKAR¹, AND M. KAVDIA¹¹University of Arkansas, Fayetteville, AR**PS-7B-4-17** Shear Stress Controls Capillary Sprouting in a Microfluidic DeviceJ. W. SONG¹, AND L. L. MUNN¹¹Massachusetts 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. MONDY¹, J. G. JACOT^{2,3}, AND C. CASTELEYN⁴¹Baylor College of Medicine, Houston, TX, ²Rice University, Houston, TX, ³Texas Children's Hospital, Houston, TX, ⁴Ghent University, Ghent, East Flanders, Belgium**PS-7B-4-19** CANCELED**PS-7B-4-20** Influence of Permeability on Shear Stress Distribution Along Capillary SproutsW. WANG¹, P. C. STAPOR¹, W. L. MURFEE¹, AND D. B. KHISMATULLIN¹¹Tulane University, New Orleans, LA**PS-7B-4-21** Effect of Antiangiogenic Agents on Tumor Vasculature and Microenvironment in Orthotopic Tumor ModelsD. A. LACORRE¹, W. S. KAMOUN¹, J. Y. PERENTES¹, S. V. KOZIN¹, E. DI TOMASO¹, D. G. DUDA¹, R. K. JAIN¹, AND L. L. MUNN¹¹Edwin 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 NOUNOU¹, S. CHUNG¹, K. EMMANOUIL¹, T. PHAM¹, Z. LU¹, B. MCCONNELL¹, AND M. BIKRAM¹¹University of Houston, Houston, TX**PS-7B-4-23** The Interplay of Cyclic Strain and Vascular Endothelial Growth Factor in rRegulating AngiogenesisJ. WILKINS¹, A. KUBOTA¹, AND Y-T. E. SHIU^{1,2}¹Department of Bioengineering, University of Utah, Salt Lake City, UT, ²Department 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. TYRRELL¹, W. S. KAMOUN², AND L. L. MUNN³¹Thomson Reuters, New York, NY, ²Massachusetts General Hospital, Boston, MA, ³Harvard Medical School, Charlestown, MA**PS-7B-4-25** A Bottom-Up Approach To Vascular Tissue EngineeringS. COLLINS¹, AND Y-J. GENG¹¹UT 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. NISHITANI¹, T. A. SAIF¹, AND Y. WANG¹¹University of Illinois at Urbana-Champaign, Urbana, IL**PS-7B-5-27** Molecular Engineering and Live Cell ImagingY. WANG¹¹University 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. MILLET¹, K. PARK¹, AND R. BASHIR¹¹University of Illinois at Urbana Champaign, Urbana, IL**PS-7B-5-29** Strategies to Modulate Calcium Signals and Induce Calcium InfluxE. PHAM¹, AND K. TRUONG¹¹University of Toronto, Toronto, Ontario, Canada**PS-7B-5-30** Using X-ray Tomography to Get a Three-Dimensional Representation of Cell Growth in ScaffoldsJ. CARTER¹, AND C. AGRAWAL¹¹University of Texas San Antonio, San Antonio, TX**PS-7B-5-31** Quantitative Analysis of Glucocorticoid Receptor Sub-Cellular Movement in Sheared Endothelial CellsA. NAYEBOSADRI¹, AND J. Y. JI²¹Purdue University, West Lafayette, IN, ²Indiana 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 SUNDARAM¹, A. BASTIAN¹, G. ENG², K. MCFADDEN³, M. CONTARINO³, I. M. CHAIKEN³, AND E. S. PAPAZOGLOU¹¹Drexel University, Philadelphia, PA, ²Duke University, Durham, NC, ³Drexel University College of Medicine, Philadelphia, PA**PS-7B-5-33** SIRT1 Inhibition Induces Oxidative Stress in Endothelial CellsD. T. NGUYEN¹, AND M. KAVDIA¹¹University 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. PRIETO¹, AND H. J. KWON¹¹Andrews University, Berrien Springs, MI**PS-7B-6-35** Recharging Implanted Electronics With an Electric FieldT. JOCHUM¹, Z. ABZUG¹, AND P. WOLF¹¹Duke University, Durham, NC**PS-7B-6-36** Imaging Analysis of Carbohydrate Microarray: ToF-SIMS, SPRi and Multivariate AnalysisF. CHENG¹, K. BOLLES², AND D. M. RATNER¹¹University of Washington, Seattle, WA, ²Whitman College, Walla Walla, WA**PS-7B-6-37** DNA Dehybridization PhotolithographyS. B. RAJEWALE¹, L. HUANG¹, S-W. TAM-CHANG¹, AND N. G. PUBLICOVER¹¹University of Nevada-Reno, Reno, NV**PS-7B-6-38** Oxygen Sensitive MicrowellsE. SINKALA¹, AND D. T. EDDINGTON¹¹University of Illinois at Chicago, Chicago, IL**PS-7B-6-39** TNF Capture Dynamics within Hemoadsorption Beads Used to Treat SepsisJ. KIMMEL^{1,2}, C. LACKO³, R. DELUDE¹, AND W. FEDERSPIEL^{1,2}¹University of Pittsburgh, Pittsburgh, PA, ²McGowan Institute for Regenerative Medicine, Pittsburgh, PA, ³Carnegie Mellon University, Pittsburgh, PA**PS-7B-6-40** Simulation of Label-free Biosensors With a Photonic Crystal Open CavityS. XIAO¹, S. HUSSAIN¹, R. PETERSON¹, AND J. YE¹¹UTSA, 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. GEORGE¹¹University of Illinois at Urbana Champaign, Urbana, IL**PS-7B-6-42** Label-Free Prehybridization Imaging of Printed DNA Microarrays for Spot Quality AnalysisS. GEORGE¹¹University of Illinois at Urbana Champaign, Urbana, IL**PS-7B-6-43** Development of a Food Quality Monitor Based on Miniature Flexible pH SensorsW-D. HUANG¹, S. DEB¹, Y. SEO¹, AND J-C. CHIAO¹¹University of Texas at Arlington, Arlington, TX**PS-7B-6-44** An Integrated Circuit for Wireless Load-Modulation TranspondersY-S. SEO¹, W-D. HUANG¹, AND J-C. CHIAO¹¹University of Texas at Arlington, Arlington, TX**PS-7B-6-45** Novel Double Lumen Catheter for Delivery of Materials at the Tissue-implant InterfaceA. PERAMO¹, AND C. MARCELO¹¹University of Michigan, Ann Arbor, MI**PS-7B-6-46** Conducting Polymer Devices for Control of Cell AdhesionA. M. WAN¹, E. ISMAILOVA², D. J. BROOKS¹, C. K. OBER¹, D. GOURDON¹, C. FISCHBACH¹, AND G. G. MALLIARAS^{1,2}¹Cornell University, Ithaca, NY, ²Ecole Nationale Supérieure des Mines de Saint-Etienne, Gardanne, France**PS-7B-6-47** Single-Biomolecule Detection using Polymer-based Photonic Crystal BiosensorsB. HAMZA¹, Y. LIU¹, AND J. DAWSON¹¹West Virginia University, Morgantown, WV**PS-7B-6-48** Influence of Recognition Element Conformation and Conjugation Parameters on FET Protein SensorsT. R. NICHOLSON III^{1,2}, S. K. GUPTA^{1,2}, P. CASAL^{1,2}, X. WEN¹, H-H. WU¹, W. LU¹, L. BRILLSON¹, AND S. C. LEE^{1,2}¹The Ohio State University, Columbus, OH, ²Dorothy 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. GUPTA¹, X. WEN¹, P. CASAL¹, M. PALACIO¹, H. H. WU¹, W. LU¹, L. BRILLSON¹, B. BHUSHAN¹, AND S. C. LEE¹¹The Ohio State University, Columbus, OH**PS-7B-6-50** Receptor Conjugation Strategies and FET Protein Sensor PerformanceP. CASAL¹, S. K. GUPTA¹, T. R. NICHOLSON III¹, X. R. WEN¹, M. L. PALACIO¹, H. H. WU¹, W. L. LU¹, B. L. BHUSHAN¹, L. J. BRILLSON¹, AND S. C. LEE¹¹Ohio State University, Columbus, OH**PS-7B-6-51** Tuning Adhesion Failure Strength For Tissue-Specific ApplicationsN. ARTZI^{1,2}, A. ZEIGER¹, F. BOEHNING³, A. B. RAMOS^{1,4}, K. V. VLIET¹, AND E. EDELMAN^{1,2}¹MIT, Cambridge, MA, ²Brigham and Women Hospital, Harvard Medical School, Boston, MA, ³MIT, Concord, MA, ⁴Institut Quimic de Sarria, Barcelona, Spain, Spain**PS-7B-6-52** Design of a Tissue Implantable Lactate Sensor for Continuous *In Vivo* MonitoringD. A. BAKER¹¹University of California, San Diego, La Jolla, CA**PS-7B-6-53** Interferometric Imaging Biosensor for Single Pathogen DetectionG. DAABOUL¹¹Boston University, Boston, MA**PS-7B-6-54** A Novel Sensor for Continuous Glucose MonitoringJ. V. VEETIL¹, S. JIN¹, AND K. YE¹¹University of Arkansas, Fayetteville, AR**PS-7B-6-55** Encapsulation of a Con-A/Glycodendrimer Glucose Sensing Assay using Microporated Hydrogel SpheresB. M. CUMMINS¹, M. PISHKO¹, E. SIMANEK¹, AND G. COTÉ¹¹Texas 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. SIN¹, V. GAU², J. LIAO³, AND P. WONG¹¹University of Arizona, Tucson, AZ, ²GeneFluidics Inc, Monterey Park, CA, ³University of Stanford, Palo Alto, CA**PS-7B-6-57** Effect of Protein-Affinity Ligands in Molecular Imprinting of Proteins in Thin Films of HydrogelA. AVALOS¹, AND A. NADARAJAH¹¹University of Toledo, Toledo, OH**PS-7B-6-58** Measuring Dynamic Properties of Round Window Membrane by Electromagnetic Force StimulationD. NAKMALI¹, X. ZHANG¹, AND R. Z. GAN¹¹University of Oklahoma, Norman, OK**PS-7B-6-59** Shape Memory Polymers with Silicon-Containing SegmentsD. ZHANG¹, S. L. PRUKOP¹, M. L. GIESE¹, AND M. A. GRUNLAN¹¹Texas A&M University, College Station, TX**PS-7B-6-60** Impedimetric Characterization of Biomimetic Hydrogels Coated on Interdigitated Microsensor Electrode Arrays (IMEs)L. YANG¹, A. GUISEPPi-WILSON², AND A. GUISEPPi-ELIE³¹North Carolina Central University, Durham, NC, ²ABTECH Scientific, Inc., Richmond, VA, ³Clemson University, Clemson, SC**PS-7B-6-61** Optical Biosensor based on Protein α Nanoparticle Composite BiomaterialsR. MAJITHIA¹, J. A. JAMISON², J. PATTERSON², S. E. BONDOS², AND K. E. MEISSNER¹¹Texas A&M University, College Station, TX, ²Texas A&M Health Science Center, College Station, TX**PS-7B-6-62** Compact Interferometric Reflectance Imaging BiosensorA. REDDINGTON¹, AND R. VEDULA²¹Boston University, Boston, MA, ²Tufts University, Boston, MA**PS-7B-6-63** Multicolor Microcontact Printing of Proteins on Porous Silica for Patterned ImmunoassayE. NG¹, E. BLINKA¹, K. LOEFFLER¹, Y. HU¹, A. GOPAL¹, K. HOSHINO¹, X. LIU², M. FERRARI², AND X. ZHANG¹¹University of Texas at Austin, Austin, TX, ²University 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. KING¹, T. J. AKL¹, R. LONG¹, M. J. MCSHANE¹, M. N. ERICSON², M. WILSON^{3,4}, AND G. L. COTÉ¹¹Texas A&M University, College Station, TX, ²Oak Ridge National Laboratory, Oak Ridge, TN, ³University of Pittsburgh, Pittsburgh, PA, ⁴VA Pittsburgh Healthcare System, Pittsburgh, PA**PS-7B-6-65** Photonic Polymers for Chemical and Biological SensingO. B. AYYUB¹, J. SEKOWSKI², AND P. KOFINAS¹¹University of Maryland, College Park, MD, ²US 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. SILVERSTEIN¹, E. PARYAVI¹, H. ARANDA-ESPINOZA¹, B. J. DAIR², AND P. KOFINAS¹¹University of Maryland, College Park, MD, ²Food and Drug Administration, Silver Spring, MD**PS-7B-6-67** Miniature Biosensor for Detecting Hydrogen Peroxide Release from a Small Cell PopulationJ. YAN¹, V. PERDOSAZ², J. ENOMOTO¹, A. SIMONIAN², AND A. REVZIN¹¹University of California, Davis, Davis, CA, ²Auburn University, Auburn, AL**PS-7B-6-68** Response and Stability Optimization of Microsphere Glucose Sensors Utilizing Catalase and NanofilmsB. COLLIER¹, AND M. J. MCSHANE¹¹Texas A&M University, College Station, TX**PS-7B-6-69** Activity of Layer-by-Layer Immobilized Glutamate OxidaseS. M. TANGUTOORU¹, V. L. KOPPARTHY¹, H. T. ALSHAKHOURI¹, M. A. DECOSTER¹, AND E. J. GUILBEAU¹¹Louisiana Tech University, Ruston, LA**PS-7B-6-70** Microfluidic Devices to Monitor Single Cardiac Physiology Under Hypoxic ConditionsI. A. GES¹, AND F. BAUDENBACHER¹¹Vanderbilt University, Nashville, TN**PS-7B-6-71** Optimizing Protein Recognitive Hydrogel Systems for Biosensor ApplicationsD. KRYSZCIO¹, AND N. PEPPAS¹¹The University of Texas at Austin, Austin, TX**PS-7B-6-72** A Novel Cancer Therapeutic Device for Circulating Tumor Cell Elimination From BloodM. ZHOU¹, R. HAROUAKA¹, AND S. ZHENG¹¹Pennsylvania 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. SRINIVASAN¹, B. G. VILENTCHOUK¹, W. DRIESSEN², B. PRONETH², P. DECUZZI³, W. ARAP², R. PASQUALINI², AND M. FERRARI¹¹University of Texas at Houston, Houston, TX, ²MD Anderson Cancer Center, Houston, TX, ³University of Magna Graecia Viale Europa - LOC, Germaneto Catanzaro, Italy**PS-7B-7-74** Bioimpedance Tuning Electroporation for Optimizing Targeted Intradermal DNA DeliveryJ. MEDRANO¹, R. CONNOLLY¹, J. I. REY¹, A. ANDERSON¹, R. GITLIN¹, AND M. JAROSZESKI¹¹University of South Florida, Tampa, FL

PS-7B-7-75 EphrinA1-conjugated Liposomes for Targeted Delivery of Chemotherapeutic Agents to Glioblastoma CellsH. CHO¹, W. LEE¹, J. M. SAUL², AND Y. W. LEE¹¹Virginia Tech-Wake Forest University, Blacksburg, VA, ²Virginia 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. SELVAM¹, I. M. EL-SHERBINY¹, AND H. D. SMYTH¹¹University of Texas at Austin, Austin, TX**PS-7B-7-77** Logic-Embedded Vectors for Intracellular Partitioning and Exocytosis of NanoparticlesR. E. SERDA¹, A. MACK¹, A. VAN DE VEN¹, S. FERRATI¹, B. GODIN¹, AND M. FERRARI^{1,2}¹UTHSC, Houston, TX, ²MD Anderson Cancer Center, Houston, TX**PS-7B-7-78** Multi-functional Hydrogel Nanocomposite for Drug Delivery ApplicationsA. QURESHI¹, AND D. HAYES¹¹Louisiana 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. ALMERIA¹, T. M. FAHMY¹, AND A. GOMEZ¹¹Yale University, New Haven, CT**PS-7B-7-80** N-acetylgalactosamine Functionalized Dendrimers as Liver-Targeted Drug CarriersS. H. MEDINA¹, V. TEKUMALLA¹, M. CHEVLIKOV¹, D. S. SHEWACH¹, W. D. ENSMINGER¹, AND M. E. EL-SAYED¹¹University 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. RAYMOND¹, S. M. CHRZANOWSKI¹, C. K. HOLLAND¹, AND G. J. SHAW¹¹University of Cincinnati, Cincinnati, OH**PS-7B-7-82** Uptake and Clearance of Spherical Gold Nanoparticles in 3D Liver MimicsC. J. DETZEL¹, AND P. RAJAGOPALAN¹¹Virginia Polytechnic Institute and State University, Blacksburg, VA**PS-7B-7-83** Molecular Probes for Visualization of HIV Protease InhibitionH. YAO¹, J. V. VELICHAMTHOTU¹, K. YE¹, AND S. JIN¹¹University of Arkansas, Fayetteville, AR**PS-7B-7-84** Effect of Formulation Factors on Chitosan Particle PropertiesB. KOPPOLU¹, AND D. A. ZAHAROFF¹¹University of Arkansas, Fayetteville, AR**PS-7B-7-85** Significance of Electrostatic Properties of M cells with Respect to Microparticle UptakeP. JREU¹, T. RAJAPAKSA¹, D. LO¹, AND V. G. J. RODGERS¹¹University of California, Riverside, CA**PS-7B-7-86** Theranostic Nanoparticles for Cancer Diagnosis and TreatmentA. WADAJKAR^{1,2}, P. RAJAN^{1,2}, Z. BHAVSAR^{1,2}, B. KOPPOLU^{1,2}, Y. ZHANG^{1,2}, W. CUI², L. TANG^{1,2}, J. YANG^{1,2}, AND K. T. NGUYEN^{1,2}¹UT Arlington, Arlington, TX, ²UT 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. BENNETT¹, T. E. RAJAPAKSA¹, V. G. RODGERS¹, AND D. D. LO¹¹University of California Riverside, Riverside, CA**PS-7B-7-88** Triggering Drug Release from Temperature Sensitive Liposomes via Photothermal Heating of Hollow Gold NanoshellsN. FORBES¹, AND J. ZASADZINSKI¹¹University of California, Santa Barbara, Santa Barbara, CA**PS-7B-7-89** Targeted Therapeutic Gene Delivery by Sonoporation in Inflammatory Bowel DiseaseJ. L. TLAXCA¹, C. R. ANDERSON², J. J. RYCHAK², A. L. KLIBANOV¹, AND M. B. LAWRENCE¹¹University of Virginia, Charlottesville, VA, ²Targeson, Inc, San Diego, CA**PS-7B-7-90** Infusion-Pressure Transducer System to Determine Hydraulic Conductivity in Soft TissuesT. NOBREGA¹, J. H. KIM¹, AND M. SARNTINORANONT¹¹University of Florida, Gainesville, FL**PS-7B-7-91** Effect of Plasticizers on the Properties of Drug Delivery FilmsC. L. RABEK¹, D. PULEO¹, AND T. DZIUBLA¹¹UNIVERSITY OF KENTUCKY, LEXINGTON, KY**PS-7B-7-92** In Situ Composite Hydrogel System for Treatment of Complex WoundsN. V. APHALE^{1,2}, H. XU^{1,2}, D. GYAWALI^{1,2}, A. WADAJKAR^{1,2}, L. TANG^{1,2}, J. YANG^{1,2}, AND K. NGUYEN^{1,2}¹University of Texas at Arlington, Arlington, TX, ²University of Texas Southwestern Medical Center, Dallas, TX**PS-7B-7-93** Aptamer-Functionalized Biomaterials for Pulsatile Proteins ReleaseB. SOONTORNWORAJIT¹, J. ZHOU¹, AND Y. WANG¹¹University of Connecticut, Storrs, CT**PS-7B-7-94** Size-dependent Biodistribution and Retention of Nanoparticles After Intravenous Administration in MiceW-Y. LIAO¹, C-W. TANG¹, A. TANG¹, M-Y. CHANG², AND P. HSIEH²¹Institute of Clinical Medicine & Research Center of Clinical Medicine, Tainan, Taiwan, Tainan, Taiwan, Taiwan, ²Institute 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. KOZIKOWSKI¹, B. WEBER¹, G. HOCHHAUS¹, AND B. S. SORG¹¹University of Florida, Gainesville, FL**PS-7B-7-96** Vascular Targeting of Multistage VectorsA. MACK¹, S. FERRATI¹, M. FERRARI^{1,2}, AND R. SERDA¹¹University of Texas Health Science Center, Houston, TX, ²Rice University, Houston, TX**PS-7B-7-97** Cylindrical Micelles Targeted to B-cell LymphomasB. HARRIS¹, AND P. DALHAIMER¹¹Univ. of Tennessee, Knoxville, TN**PS-7B-7-98** Dynamic Docking Method in Virtual ScreeningT. YANG¹¹The 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^{1,2}, B. KOPPOLU^{1,2}, A. WADAJKAR^{1,2}, W. CUI², AND K. T. NGUYEN^{1,2}¹UT Arlington, Arlington, TX, ²UT Southwestern Medical Center, Dallas, TX**PS-7B-7-100** Virus-Inspired Design Principles of Nanoparticles as Therapeutic AgentsS. ZHANG¹, H. YUAN¹, J. LI², AND G. BAO³¹Penn State University, University Park, PA, ²Univ. Pennsylvania, Philadelphia, PA, ³Georgia Tech, Atlanta, GA**PS-7B-7-101** Microsphere-based Delivery of Betamethasone to Differentiating Human Mesenchymal Stem CellsT. RICHEY¹, M. SMITH¹, B. THANOO¹, K. J. PENICK², AND J. F. WELTER²¹Oakwood Laboratories, Oakwood, OH, ²Case Western Reserve University, Cleveland, OH**PS-7B-7-102** Cylinders vs. Spheres: Biofluid Shear Thinning in Driven Nanoparticle TransportJ. A. CRIBB¹, T. MEEHAN², S. M. SHAH³, K. SKINNER¹, AND R. SUPERFINE¹¹UNC - Chapel Hill, Chapel Hill, NC, ²University of Queensland, St. Lucia, QLD, Australia, ³University 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. NGUYEN¹, Y. SUNNY¹, E. PAPAZOGLU¹, AND P. LEWIN¹¹Drexel University, Philadelphia, PA**PS-7B-7-104** Potency Enhancement of gp120-targeted HIV-1 Entry Inhibitors Conjugated to Gold Nanoparticles.A. ROSEMARY BASTIAN¹, R. K. SUNDARAM¹, S. RAJAGOPAL¹, K. MCFADDEN¹, K. KANTHARAJU¹, E. PAPAZOGLU¹, AND I. CHAIKEN¹¹Drexel University, Philadelphia, PA**PS-7B-7-105** Antibody Presentation Localized to Lipid Microdomains for Enhanced Liposome Binding to EndotheliumD. ALMEDA¹, AND D. T. AUGUSTE¹¹Harvard University, Cambridge, MA**PS-7B-7-106** Stealth-Targeted Liposomes for Invasive Mould InfectionsN. L. CHAVAN¹¹University of Houston, Houston, TX**PS-7B-7-107** Characterization of Nanoparticle Targeted Delivery in MicrocirculationY. LIU¹, J. TAN¹, AND K. NGUYEN¹¹University 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. WILLERTH¹, H. PEDRO¹, A. P. ARKIN¹, AND D. V. SCHAFER¹¹University of California-Berkeley, Berkeley, CA**PS-7B-8-109** Improving Ethacrynic Acid Delivery Based on Cellular Pharmacokinetic and Pharmacodynamic AnalysesF. YUAN¹, AND C-W. LIN¹¹Duke University, Durham, NC**PS-7B-8-110** Development of Microspheres for Controlled Release of Thymosin -4 in the Ischemic MyocardiumJ. E. THATCHER¹, K. NGUYEN², Z. SCHELLY², I. BOCK-MARQUETTE¹, R. EBERHART¹, AND J. M. DIMAIO¹¹UT Southwestern Medical Center, Dallas, TX, ²University of Texas at Arlington, Arlington, TX**PS-7B-8-111** Cell Type Specific Nano-ToxicologyS. FERRATI¹, A. MACK¹, M. FERRARI^{1,2}, AND R. SERDA¹¹University of Texas Health Science Center, Houston, TX, ²Rice University, Houston, TX**PS-7B-8-112** Confinement and Concentration Effects on Glucose Transport in NanochannelsA. ZIEMYS¹, A. GRATTONI¹, D. FINE¹, F. HUSSAIN², AND M. FERRARI^{1,3}¹The University of Texas Health Science Center - Houston, Houston, TX, ²University of Houston, Houston, TX, ³The 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^{1,2}, N. BHADRA^{1,2}, AND K. J. GUSTAFSON^{1,2}¹Case Western Reserve University, Cleveland, OH, ²Louis Stokes VA Medical Center, Cleveland, OH**PS-7B-9-114** High Frequency Electric Stimulation of Retinal Neurons Elicits Physiological Signaling PatternsS. FRIED^{1,2}, C. CAI^{1,3}, J. RIZZO^{1,4}, AND Q. REN³¹Boston VA Healthcare System, Boston, MA, ²Mass General Hospital / Harvard Medical School, Boston, MA, ³Shanghai Jiao-Tong University, Shanghai, Shanghai, China, People's Republic of, ⁴Mass. Eye and Ear Infirmary, Boston, MA**PS-7B-9-115** Selective Activation of Retinal Neurons with Sinusoidal Electric StimulationD. K. FREEMAN^{1,2}, J. F. RIZZO III^{1,3}, AND S. I. FRIED^{1,2}¹Boston VA Healthcare System, Boston, MA, ²Massachusetts General Hospital, Harvard Medical School, Boston, MA, ³Massachusetts 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. MERRIAM¹, S. DEHMEL¹, O. SRIVANNAVIT¹, S. E. SHORE¹, AND K. D. WISE¹¹University of Michigan, Ann Arbor, MI**PS-7B-9-117** Ultra-High Photosensitivity Vertical Nanowire Arrays for Retinal ProsthesisM. L. KHRAICHE¹, G. SILVA¹, G. CAUWENBERGHS¹, D. WANG¹, Y. LO¹, AND W. FREEMAN²¹UCSD, San Diego, CA, ²Jacobs Retina Center, San Diego, CA**PS-7B-9-118** Two Classes of Action Potentials are Initiated by Electric Stimulation of Retinal Ganglion CellsC. CAI^{1,2}, Q. REN², AND S. FRIED^{1,3}¹Mass General Hospital / Harvard Medical School, Boston, MA, ²Shanghai Jiao-Tong University, Shanghai, Shanghai, China, People's Republic of, ³Boston VA Healthcare System, Jamaica Plain, MA**PS-7B-9-119** Activation of Inner-Ear Hair Cells and Afferent Neurons by Pulsed Infrared RadiationS. M. RAJGURU¹, G. M. DITTMAR², R. D. RABBITT^{2,3}, C-P. RICHTER^{1,4}, AND S. M. HIGHSTEIN³¹Northwestern University, Chicago, IL, ²University of Utah, Salt Lake City, UT, ³Marine Biological Laboratory, Woods Hole, MA, ⁴Northwestern University, Evanston, IL**PS-7B-9-120** Effects of Stimulus Pulse Parameters on Eye Movement Responses to Stimulation Delivered by a Vestibular ProsthesisN. S. DAVIDOVICS¹, G. Y. FRIDMAN², B. S. CHIANG¹, AND C. DELLA SANTINA¹¹Johns Hopkins University, Baltimore, MD, ²Johns Hopkins University, Pikesville, MD**Track: Neural Engineering – PS-7B-10****Translational Neural Engineering****PS-7B-10-121** Electromagnetic Interference on Intraoperative Neurophysiological Monitoring SignalsA. FARAJIDAVAR¹, J. SEIFERT¹, J. STEARNS¹, M. ROMERO¹, AND J-C. CHIAO¹¹The 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. UPADHYAYULA¹, S. BISHOP¹, N. JOHNSON¹, T. QUINATA¹, P. NALLAGATLA¹, S. GUPTA¹, AND V. VULLEV¹¹University of California, Riverside, Riverside, CA**PS-7B-11-123** Compression Instrument for Meso-Scale Tissue Experiments (CITE)D. W. EVANS^{1,2}, AND J. L. SPARKS^{1,2}¹Virginia Tech - Wake Forest Center for Injury Biomechanics, Winston Salem, NC, ²Virginia 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. LEE¹, S-Y. TEH², A. LEE², H. KIM¹, C. LEE¹, AND K. K. SHUNG¹¹University of Southern California, Los Angeles, CA, ²University of California at Irvine, Irvine, CA**PS-7B-11-125** The Stress-State and Strain-Rate Dependency of Human Placenta TissueB. WEED¹, A. BORAZJANI¹, S. PATNAIK¹, R. PRABHU¹, M. HORSTEMEYER¹, L. WILLIAMS¹, AND J. LIAO¹¹Mississippi State University, Mississippi State, MS**PS-7B-11-126** Exploring Cellular Mechanotransduction, One Molecule at a TimeM. R. MOFRAD¹¹University of California, Berkeley, Berkeley, CA**PS-7B-11-127** Mechanical Modeling of Morphology and Morphogenetic Events in the Drosophila EyeS. HILGENFELDT^{1,2}, I. M. GEMP², AND R. A. CARTHEW²¹University of Illinois at Urbana-Champaign, Urbana, IL, ²Northwestern University, Evanston, IL**PS-7B-11-128** Modeling the Coherent and Autonomous Biomechanical Behavior of Cells Using an Agent-Based ApproachN. I. MOLDOVAN¹¹Davis Heart and Lung Research Institute, The Ohio State University, Columbus, OH**PS-7B-11-129** In Situ Force Mapping of Mammary Gland TransformationJ. I. LOPEZ¹, AND V. WEAVER¹¹UCSF, San Francisco, CA**PS-7B-11-130** Inhibition of Hsp90 for Enhanced In Vitro Photothermal Ablation of Cancer CellsS. K. SHIMP III¹, J. WHITNEY¹, B. WILL¹, C. ZAWASKI¹, AND M. N. RYLANDER¹¹Virginia Tech, Blacksburg, VA**PS-7B-11-131** Probing Mechanisms of Mechano-sensitive Differentiation in Mesenchymal Stem CellsA. W. HOLLE¹, N. S. JOSHI¹, D. VIJAYRAGHAVAN¹, AND A. J. ENGLER¹¹UC San Diego, La Jolla, CA**PS-7B-11-132** Molecular Mechanics of Filamin: FLNA Repeats 16-17 Response to Applied ForceH. PEZESHKI¹, AND M. R. MOFRAD¹¹University of California, Berkeley, Berkeley, CA**PS-7B-11-133** Mechanosensitivity of Cardiac Cells and Its Implication on Myocardial InfarctionX. TANG¹, P. BAJAJ¹, R. BASHIR¹, AND T. A. SAIF¹¹University of Illinois at Urbana-Champaign, Urbana, IL**PS-7B-11-134** Lamins & Granulopoiesis – How Altered Nuclear Mechanics Can Improve Passage Through Narrow SpacesA. ROWAT¹, D. E. JAALOUK², D. A. WEITZ¹, AND J. LAMMERDING²¹Harvard University, Cambridge, MA, ²Brigham 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. BHADANE¹, AND M. ELAHINIA¹¹University of Toledo, Toledo, OH**PS-7B-12-136** Quantitative Analysis of an AFO Cut-Line Measurement TechniqueT. J. WARRICK¹, S. BIELBY¹, E. SKEWES², R. BROOKS², D. BENSON², C. DUNNING¹, AND J. D. DESJARDINS¹¹Clemson University, Clemson, SC, ²Shriners Hospital of Greenville SC, Greenville, SC**PS-7B-12-137** An FE Model for Stress Reduction at the Skin-Implant Interface of Osseointegrated ProsthesesS. YERNENI^{1,2}, AND T. A. KUIKEN^{1,2}¹Northwestern University, Evanston, IL, ²Rehabilitation Institute of Chicago, Chicago, IL**PS-7B-12-138** Characterization of Goat Adipose and Bone Marrow Derived Stem Cells For Orthopaedic TherapiesD. B. NEIDRE¹, A. SARATHY¹, J. TREFF¹, Z. GARZA², A. NEIDRE³, J. POSER⁴, AND R. P. FARRAR¹¹The University of Texas at Austin, Austin, TX, ²The University of Texas Health Science Center at San Antonio, San Antonio, TX, ³South Texas Orthopaedic and Spinal Surgery Associates, San Antonio, TX, ⁴SpineSmith Partners LTD, Austin, TX**PS-7B-12-139** Shear-Plane Motion in Unicondylar Knee Replacements with Change to Simulated Soft-Tissue ConstraintJ. B. MATHENY¹, B. L. ROACH¹, M. SPINELLI¹, AND J. D. DESJARDINS¹¹Clemson University, Clemson, SC**PS-7B-12-140** Comparative Analysis of Retrieved Genesis II UHMWPE Articulating Against OxZr vs. CoCr Femoral ComponentsH. M. CASH¹, E. ALVAREZ¹, M. E. ELPERS¹, M. E. WABLER¹, F. R. VOSS², AND J. D. DESJARDINS¹¹Clemson University, Clemson, SC, ²University of South Carolina, Columbia, SC**PS-7B-12-141** Analysis and Damage Characterization of PS Total Knee Joint Replacement PostsE. E. SLOAN¹, E. ALVAREZ¹, M. E. ELPERS¹, H. M. CASH¹, M. E. WABLER¹, AND J. D. DESJARDINS¹¹Clemson University, Clemson, SC**PS-7B-12-142** Modeling Variations in Varus-Valgus Laxity in the Healthy Knee JointB. MORSE¹, C. CLARY², A. J. CYR³, P. D. FUNKENBUSH¹, L. MALETSKY³, AND A. L. LERNER¹¹University of Rochester, Rochester, NY, ²DePuy Orthopaedics, Warsaw, IN, ³University of Kansas, Lawrence, KS**PS-7B-12-143** Cervical Endplates are Affected by Incomplete Length of Annular Fibers: A Finite AnalysisM. HUSSAIN¹, R. E. GAY², AND K-N. AN³¹Logan University, Chesterfield, MO, ²Mayo Clinic, Rochester, MN, ³Mayo Clinics, Rochester, MN**PS-7B-12-144** Inner Trabecular Bone is More Affected Than Outer Cortical Bone Due to Incomplete Annular FibersM. HUSSAIN¹, R. E. GAY², AND K-N. AN³¹Logan University, Chesterfield, MO, ²Mayo Clinic, Rochester, MN, ³Mayo Clinics, Rochester, MN**PS-7B-12-145** Evaluation of a Novel Battery-Powered Spinal InstrumentS. VADAPALLI¹, S. SUMMY¹, A. MAHAJAN², D. WOODS¹, J. BHARADWAJ¹, B. STEELE¹, AND E. SAHAGUN¹¹Medtronic Spinal and Biologics, Memphis, TN, ²The University of Akron, Akron, OH**PS-7B-12-146** A Thermal Model for Bone Drilling with Application to Orthopaedic SurgeryJ. LEE¹, Y. RABIN¹, AND B. OZDOGANLAR¹¹Carnegie Mellon University, Pittsburgh, PA**PS-7B-12-147** Characterization of High Precision Experimental Model of Graded Bilateral Distraction Spinal InjuryM. ROMERO¹, J. STEARNS¹, B. ELMER¹, J. SEIFERT¹, AND D. SUCATO²¹University of Texas at Arlington, Arlington, TX, ²Texas 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

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

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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. WABLER¹, E. ALVAREZ¹, M. E. ELPERS¹, H. M. CASH¹, H. A. DEMOS², H. D. SCHUTTE JR.², AND J. D. DESJARDINS¹

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

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

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

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

J. MARTIN¹, S. SRIPADA², P. SETHU², AND M. SAUNDERS¹

¹University of Kentucky, Lexington, KY, ²University of Louisville, Louisville, KY

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

M. E. ELPERS¹, E. ALVAREZ¹, H. M. CASH¹, M. E. WABLER¹, B. BURNIKEL², J. RODRIGO², AND J. D. DESJARDINS¹

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

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

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

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

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

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

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

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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

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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. TAI¹, AND J. B. GROTEBERG¹

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

J. WRIGHT¹, R. C. EBERHART², AND C-J. CHUONG¹

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

H. RADHAKRISHNAN¹, AND S. C. KASSINOS¹

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

J. E. PILLERT¹, H. FUJIOKA¹, D. HALPERN², AND D. P. GAVER¹

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

J. W. THIEMAN¹, B. J. SMITH¹, AND D. P. GAVER¹

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

S. KABLAN¹, A. P. KUPPRAT², R. A. CORLEY², J. P. CARSON², K. R. MINARD², R. E. JACOB², M. P. HLASTALA¹, AND D. R. EINSTEIN²

¹University of Washington, Seattle, WA, ²Pacific Northwest National Laboratory, Richland, WA

PS-7B-15-170 Transient Displacement of a Gas Finger in a Channel Filled by a Bingham FluidP. ZAMANKHAN¹, S. TAKAYAMA¹, AND J. GROTEBERG¹¹University of Michigan, Ann Arbor, MI**PS-7B-15-171** Flow and Particle Dispersion in Prototypical and Strain-driven CT-based Acinar ModelsH. KUMAR¹, Y. YIN¹, D. VASILESCU^{1,2}, M. TAWHAI³, E. A. HOFFMAN¹, AND C-L. LIN¹¹The University of Iowa, Iowa City, IA, ²Philipps University, Marburg, Germany, ³The University of Auckland, Auckland, New Zealand**PS-7B-15-172** Developing a MDCT-based Breathing Lung Model for CFD Simulation of Air FlowY. YIN¹, J. CHOI¹, E. A. HOFFMAN¹, AND C-L. LIN¹¹The University of Iowa, Iowa City, IA**PS-7B-15-173** Multiscale Subject Specific Breathing Lung SimulationJ. CHOI¹, Y. YIN¹, M. H. TAWHAI³, E. A. HOFFMAN¹, AND C-L. LIN¹¹The University of Iowa, Iowa City, IA, ²Bioengineering 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. REYNOLDS¹, AND D. FRAZER¹¹NIOSH, 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. FRAZER¹, J. REYNOLDS¹, T. GOLDSMITH¹, M. JACKSON¹, W. MCKINNEY¹, AND A. AFSHARI¹¹NIOSH, Morgantown, WV**PS-7B-16-176** The Effects of Mechanotransduction on Airway Smooth Muscle Protein ExpressionC. MILLER¹¹Saint Louis University, St Louis, MO**PS-7B-16-177** Evaluation of Cellular Damage Near Bifurcations in a Model of AtelectraumaD. MARTIN¹, A-M. JACOB¹, AND D. P. GAVER¹¹Tulane University, New Orleans, LA**PS-7B-16-178** Effects of Static Stretch on the Deterioration of Lung Parenchyma by Interstitial CollagenaseE. YI¹, E. BARTOLAK-SUKI¹, S. SATO¹, T. BLUTE¹, AND B. SUKI¹¹Boston University, Boston, MA**PS-7B-16-179** Probing Softness of Parietal Pleural Surface by Atomic Force MicroscopyJ. KIM¹, J. P. BUTLER^{1,2}, AND S. H. LORING¹¹Beth Israel Deaconess Medical Center and Harvard Medical School, Boston, MA, ²Harvard 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^{1,2}, R. SUKI¹, AND B. SUKI¹¹Boston University, Boston, MA, ²Cellulaf 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. LEE¹, M. J. BULLER¹, W. J. THARION¹, J. PISANI², S. R. GORDON², AND B. A. BEIDLEMAN¹¹US Army Research Institute of Environmental Medicine, Natick, MA, ²Hidalgo, Ltd, Swavesey, United Kingdom**PS-7B-17-182** The Value of Biomedical Simulation Environments to Future Human Space Flight MissionsL. MULUGETA¹, J. G. MYERS², N. G. SKYTLAND³, AND S. H. PLATTS³¹Universities Space Research Association, Houston, TX, ²NASA - Glenn Research Center, Cleveland, OH, ³NASA - Johnson Space Center, Houston, TX**PS-7B-17-183** Multi-scale Modeling of Tumor Necrosis Factor-regulated Granuloma Formation in TuberculosisM. FALLAHI-SICHANI¹, M. EL-KEBIR^{2,3}, S. MARINO², D. E. KIRSCHNER², AND J. J. LINDERMAN¹¹University of Michigan, Ann Arbor, MI, ²University of Michigan Medical School, Ann Arbor, MI, ³VU 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. GAN¹, F. YANG¹, AND X. ZHANG¹¹University of Oklahoma, Norman, OK**PS-7B-17-185** Common Gene Network Motifs for Multistability and Cell DifferentiationX. WANG¹, AND J. J. COLLINS²¹Arizona State University, Tempe, AZ, ²Boston University, Boston, MA**PS-7B-17-186** Biomechanical Modeling of Eye Trauma for Different Orbit AnthropometriesA. A. WEAVER^{1,2}, K. L. LOFTIS^{1,2}, S. M. DUMA^{1,3}, AND J. D. STITZEL^{1,2}¹Virginia Tech-Wake Forest University Center for Injury Biomechanics, Winston-Salem, NC, ²Wake Forest University School of Medicine, Winston-Salem, NC, ³Virginia Polytechnic Institute and State University, Blacksburg, VA**PS-7B-17-187** Evaluation of Different Projectiles in Matched Experimental Eye Impact SimulationsA. A. WEAVER^{1,2}, E. A. KENNEDY³, S. M. DUMA^{1,4}, AND J. D. STITZEL^{1,2}¹Virginia Tech-Wake Forest University Center for Injury Biomechanics, Winston-Salem, NC, ²Wake Forest University School of Medicine, Winston-Salem, NC, ³Bucknell University, Lewisburg, PA, ⁴Virginia Polytechnic Institute and State University, Blacksburg, VA**PS-7B-17-188** Quantitative Analysis of Damage Evolution in Porcine Liver via Interruption Testing ApproachJ. CHEN¹, B. BRAZILE¹, L. PRIDDY¹, M. HORSTEMEYER¹, L. WILLIAMS¹, AND J. LIAO¹¹Mississippi State University, Mississippi State, MS**PS-7B-17-189** Collagen Fiber Damage Assessed With Multiscale Mechanical ModelsE. A. SANDER¹, M. F. HADI¹, AND V. H. BAROCAS¹¹University of Minnesota, Minneapolis, MN**PS-7B-17-190** High Rate Stress-strain Behavior: A Comparative Study of Brain, Liver, and TendonJ. CLEMMER¹, J. CHEN¹, J. LIAO¹, L. WILLIAMS¹, L. PRIDDY¹, R. PRABHU², AND M. HORSTEMEYER^{1,2}¹Mississippi State University, Mississippi State University, MS, ²Center for Advanced Vehicular Systems, Starkville, MS**PS-7B-17-191** Humans Exploit Redundancy to Control Step Variability in Treadmill WalkingJ. B. DINGWELL¹, J. JOHN², AND J. P. CUSUMANO³¹University of Texas, Austin, TX, ²Penn State University, University Park, PA, ³Pennsylvania State University, University Park, PA

PS-7B-17-192 Rule-Based Simulation of Vein Graft RemodelingM. HWANG¹, S. A. BERCELI^{1,2}, M. GARBEY², AND R. TRAN-SON-TAY¹¹University of Florida, Gainesville, FL, ²Malcom Randall VAMC, Gainesville, FL, ³University of Houston, Houston, TX**PS-7B-17-193 Computational Analysis of Endothelial Dysfunction on Free Radical Transport in Microcirculation**S. KAR¹, AND M. KAVDIA¹¹University of Arkansas, Fayetteville, AR**PS-7B-17-194 Predicting the Dynamics of Arbitrarily Shaped Micro/Nanoparticles in a Capillary Flow**M. D. DE TULLIO¹, G. ADRIANI¹, P. DECUZZI², P. DE PALMA¹, AND G. PASCAZIO¹¹Politecnico di Bari, Bari, Bari, Italy, ²The University of Texas Medical School at Houston, Houston, TX**PS-7B-17-195 Modeling Circadian Rhythms in Human Endotoxemia**J. D. SCHEFF¹, S. E. CALVANO², S. F. LOWRY², AND I. P. ANDROULAKIS¹¹Rutgers University, Piscataway, NJ, ²UMDNJ-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. FENG¹, D. PAREKH², J. A. LONG¹, R. CANTY¹, AND L. DAVILA¹¹UTSA, San Antonio, TX, ²UTHSCSA, San Antonio, TX**PS-7B-17-197 New Tools for Multiscale Cell-to-Organ Modeling Using Deformable 3D Atlases**J. P. CARSON¹, T. JU², AND I. A. KAKADIARIS³¹Pacific Northwest National Lab, Richland, WA, ²Washington University in St. Louis, St. Louis, MO, ³University of Houston, Houston, TX**PS-7B-17-198 Promoting Behavioral Rules to Agents in Modeling Angiogenesis**B. LONG¹, AND A. QUTUB¹¹Rice University, Houston, TX**PS-7B-17-199 Application of a Novel Soft Tissue Modulus Evaluation Assay to Breast Tumor Tissue**S. BARNES¹, AND M. MIGA¹¹Vanderbilt University, Nashville, TN**PS-7B-17-200 Multi-scale Agent-based Modeling of Human Endotoxemia**T. T. NGUYEN¹, S. S. CALVANO², S. F. LOWRY², AND I. P. ANDROULAKIS¹¹Rutgers University, Piscataway, NJ, ²UMDNJ-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. SARKAR¹, M. K. HALLOW¹, A. SOUBRET¹, G. HELMLINGER¹, R. SARANGAPANI¹, S. ERMAKOV², A. LO², M. RODRIGO², J. BEH², H. D. LEON², AND A. GEORGIEVA¹¹Novartis Pharmaceuticals, East Hanover, NJ, ²Entelos Inc., Foster City, CA**PS-7B-17-202 Combination of Top-Down and Bottom-Up Tumor Modeling Including Chemotherapeutic Drug Treatment**B. M. FOX¹, R. A. MOFFITT¹, AND M. D. WANG¹¹Georgia 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. BEITEL¹, AND J. MA¹¹University of Illinois at Urbana-Champaign, Urbana, IL**PS-7B-18-204 Modeling the Kinetics of Hsp90 Inhibition to Reduce Immune Mediated Inflammation**S. K. SHIMP¹, E. M. COURTNEY¹, C. M. REILLY^{2,3}, AND M. N. RYLANDER¹¹Virginia Tech, Blacksburg, VA, ²Virginia College of Osteopathic Medicine, Blacksburg, VA, ³Virginia-Maryland Regional College of Veterinary Medicine, Blacksburg, VA**PS-7B-18-205 Mathematical Model of Hematopoietic Stem Cell Differentiation after Transplantation**S. M. PEARCE¹, AND A. E. RUNDELL¹¹Purdue University, West Lafayette, IN**PS-7B-18-206 Analysis of ErbB Inhibitor Sensitivity and ErbB Network Patterns in Epithelial Ovarian Cancer**R. D. PRASAD¹, K. L. POLLOCK¹, AND P. K. KREEGER¹¹University 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. KAMAL¹¹Tennessee 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. ORMAN¹, I. ANDROULAKIS¹, M. IERAPETITOU¹, AND F. BERTHIAUME¹¹Rutgers 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 YANG¹, M. A. ORMAN¹, I. ANDROULAKIS¹, F. BERTHIAUME¹, AND M. IERAPETITOU¹¹Rutgers University, Piscataway, NJ**PS-7B-18-210 Phosphorylation of Alanine-Directed Substrates by MAP-Kinases: an Over-looked Specificity?**T. S. KAOU¹, M. A. RAINEY², L. LIU³, AND K. N. DALBY¹¹Division of Medicinal Chemistry, College of Pharmacy, University of Texas at Austin, TX, Austin, TX, ²Graduate Program in Molecular Biology, University of Texas at Austin, Austin, TX, ³Graduate 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. PHAN¹, J. DALE¹, C. F. QUO¹, R. M. PARRY¹, T. H. STOKES¹, AND M. D. WANG¹¹Georgia Tech and Emory University, Atlanta, GA**PS-7B-18-212 Computational Studies of the Effects of Interpersonal Variability on Cancer Drug Efficacy**L. CHU¹, AND F. MAC GABHANN¹¹Johns Hopkins University, Baltimore, MD**PS-7B-18-213 Modeling Insulin-mediated Growth Factor Signaling and Its Role in Diabetes**A. CHAKRABARTI¹, S. NAYAK¹, J. P. LEQUIEU¹, AND J. D. VARNER¹¹Cornell University, Ithaca, NY**PS-7B-19-214 Neurite Growth in PEG-Fibronectin Conjugate Hydrogels**W. ZHOU^{1,2}, AND R. K. WILLITS^{1,2}¹Saint Louis University, St. Louis, MO, ²University of Akron, Akron, OH**PS-7B-19-215 Guidance of Dorsal Root Ganglion Neurites and Schwann Cells by Biomimetic Schwann Cell Topography**J. A. RICHARDSON¹, C. W. REMENTER¹, AND D. HOFFMAN-KIM¹¹Brown University, Providence, RI

PS-7B-19-216 Neural Tissue Engineering Scaffolds with Simultaneous Nanofibrous, Electrical, and Neurotrophic CuesC. A. MILROY¹, J. Y. LEE¹, AND C. E. SCHMIDT¹¹University of Texas, Austin, TX**PS-7B-19-217** Neurite Growth in PEG Gels: Effect of Mechanical Stiffness and Laminin ConcentrationL. M. MARQUARDT¹, AND R. K. WILLITS¹¹Saint Louis University, St. Louis, MO**PS-7B-19-218** Effect of Additives on Neurite Growth in Collagen GelsS. SAHU¹, K. E. SWINDLE-REILLY¹, AND R. K. WILLITS¹¹Saint Louis University, Saint Louis, MO**PS-7B-19-219** Controlled Release of Neurotrophic Factors from Silk Films for Nerve Cell FunctionA. R. NECTOW¹, E. M. PRITCHARD¹, AND D. L. KAPLAN¹¹Tufts University, Medford, MA**PS-7B-19-220** Alignment of Basal Lamina Protein Extract Nanofibers and Its Effect on Schwann Cell Orientation.B. J. MUNDO^{1,2}, R. L. MILLER^{1,2}, AND P. J. VANDEVORD^{1,2}¹Wayne State University, Detroit, MI, ²John D. Dingell Veterans Affairs Medical Center, Detroit, MI**PS-7B-19-221** A Novel Plant Derived Scaffold for Tissue Engineering and Regenerative MedicineS. LENAGHAN¹, K. SERPERSU¹, L. XIA¹, W. HE¹, AND M. ZHANG²¹UTK, Knoxville, TN, ²University of Tennessee, Knoxville, TN**PS-7B-19-222** Directing Neurite Outgrowth with Coaxial Electrospun Nanofibers Incorporating Nerve Growth Factor Concentration Gradient.. HANDARMIN¹, AND S. CHEW¹¹Nanyang 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^{1,2}, J. M. CREGG³, H. B. WANG⁴, D. F. WENDELL¹, J. W. McDONALD^{1,2}, AND R. J. GILBERT³¹Hugo W. Moser Research Institute at Kennedy Krieger, Baltimore, MD, ²Johns Hopkins University, Baltimore, MD, ³Michigan Technological University, Houghton, MI, ⁴Syracuse University, Syracuse, NY**PS-7B-19-224** Significant stimulation of Glioblastoma Multiforme derived Conditioned Medium on Neuronal GrowthS. VASUDEVAN¹, N. HALL¹, AND Y-T. KIM¹¹University of Texas at Arlington, Arlington, TX**PS-7B-19-225** Guiding Neuronal Cells in 3-Dimensions Using a Composite Scaffold SystemD. S. HERNANDEZ¹, S. K. SEIDLITS¹, C. E. SCHMIDT¹, AND J. B. SHEAR¹¹The 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. LEE¹, J. SUN², H. XIE³, M. KING³, AND M. SARNTINORANONT¹¹Department of Mechanical and Aerospace Engineering, Gainesville, FL, ²Electrical and Computer Engineering, Gainesville, FL, ³Pharmacology and Therapeutics, Gainesville, FL**PS-7B-19-227** Tissue Engineered Microconduits for Targeted Restoration of Axonal TractsD. CULLEN¹, M. TANG-SCHOMER¹, V. E. JOHNSON¹, A. R. PATEL¹, K. D. BROWNE¹, AND D. H. SMITH¹¹University 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. UYGUN¹, A. SOTO-GUTIERREZ², H. YAGI³, M-L. IZAMIS¹, M. GUZZARDI¹, F. BERTHIAUME¹, Y. NAHMIA¹, M. YARMUSH¹, AND K. UYGUN¹¹Massachusetts General Hospital, Harvard Medical School, Shriners Hospitals for Children, Boston, MA, ²Children's Hospital of Pittsburgh, McGowan Institute for Regenerative Medicine and University of Pitt, Pittsburgh, PA, ³Keio University School of Medicine, Tokyo, Japan**PS-7B-20-229** Engineering Compliant Polymeric Substrata for Myocardial ContractilityC. LEBLON¹, AND S. JEDLICKA¹¹Lehigh University, Bethlehem, PA**PS-7B-20-230** Mechanical Properties and In Vitro Cytocompatibility of Nanocomposite Polymer HydrogelsP. SCHEXNAILDER¹, A. GAHARWAR¹, C-J. WU¹, AND G. SCHMIDT¹¹Purdue University, West Lafayette, IN**PS-7B-20-231** Rotary Jet-Spinning: A Novel Technique of Nanofibrous Scaffold FabricationM. R. BADROSSAMAY^{1,2}, H. A. MCILWEE^{1,2}, J. A. GOSS^{1,2}, AND K. K. PARKER^{1,2}¹Disease Biophysics Group, School of Engineering and Applied Sciences, Harvard University, Cambridge, MA, ²Wyss Institute for Biologically Inspired Engineering, Harvard University, Boston, MA**PS-7B-20-232** Chondrogenitor Cells Differentiation on 3D DBM ScaffoldS. CAI¹, K. KUWAHARA¹, Z. YANG¹, AND B. HAN¹¹University of Southern California, Los Angeles, CA**PS-7B-20-233** Tunable Degradation in Protein/Synthetic Electrospun CompositesJ. KLUGE¹, E. GIL², D. L. KAPLAN², AND R. L. MAUCK¹¹University of Pennsylvania, Philadelphia, PA, ²Tufts University, Medford, MA**PS-7B-20-234** Silk-Human Tropoelastin Blend BiomaterialsX. HU¹, X. WANG¹, J. RNJAK², A. S. WEISS², AND D. L. KAPLAN¹¹Tufts University, Medford, MA, ²The University of Sydney, Sydney, NSW, Australia**PS-7B-20-235** Influencing Elastin Production In Vitro Using an Elastin Mimetic PeptideD. PATEL¹, R. MENON¹, AND L. TAITE¹¹Georgia Institute of Technology, Atlanta, GA**PS-7B-20-236** Fabrication of Functional Hydrogel Nano-structures for Biomolecule ConjugationsR. T-S. LAM¹, J-W. JANG¹, P. L. STILES¹, AND S. R. NETTIKADAN¹¹Nanolnk, Inc., Skokie, IL**PS-7B-20-237** Assessment of Using Laponite Cross-linked Poly(ethylene oxide) as Biomaterial for Bone RepairA. K. GAHARWAR¹, P. J. SCHEXNAILDER¹, C-J. WU¹, B. KLINE¹, AND G. SCHMIDT¹¹Purdue University, West Lafayette, IN**PS-7B-20-238** Predicting and Improving Gaseous Exchange in Composite Biomaterial ConstructsJ. C. WHITE¹, W. L. STOPPEL¹, S. C. ROBERTS¹, AND S. R. BHATIA¹¹University of Massachusetts Amherst, Amherst, MA

PS-7B-20-239 Novel Methacrylated Gellan Gum Hydrogels with Tunable Mechanical PropertiesD. F. COUTINHO^{1,2}, S. SANT³, H. SHIN^{3,4}, J. T. OLIVEIRA^{1,5}, M. E. GOMES^{1,5}, N. NEVES^{1,5}, A. KHADEMHOSEINI^{2,3}, AND R. REIS^{1,6}¹Bs Research Group, Biomaterials Biodegradables and Biomimetics, Guimaraes, Portugal, ²Harvard MIT Division of Health Sciences and Technology, Cambridge, MA, ³Center for Biomedical Engineering, Department of Medicine, Brigham and Womens Hospital, Cambridge, MA, ⁴Department of Materials Science and Engineering, Massachusetts Institute of Technology, Cambridge, MA, ⁵IBB, Institute for Biotechnology and Bioengineering, PT Government Associated Laboratory, Braga, Portugal, ⁶IBB 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. SCOTT¹, AND R. K. WILLITS¹¹Saint Louis University, St. Louis, MO**PS-7B-20-241 Novel Polyurethane/Carbon Nanofiber Composites for Bladder Cancer Applications**M. Tsang¹, Y. W. Chun¹, and T. J. Webster¹¹Brown University, Providence, RI**PS-7B-20-242 Elastin Mimetic Hybrid Polymers as Conductive Scaffolds for Tissue Engineering**S. E. GRIESHABER¹, A. J. FARRAN¹, K. L. KIICK¹, AND X. JIA¹¹University of Delaware, Newark, DE**PS-7B-20-243 Unique Electrochemically Synthesized Polypyrrole:poly(lactic-co-glycolic acid) Blends for Biomedical Applications**L. FORCINITI¹, N. K. GUIMARD¹, S. LEE¹, AND C. E. SCHMIDT¹¹The University of Texas at Austin, Austin, TX**PS-7B-20-244 Biocompatible Detachable Polyelectrolyte Multilayer Films for Applications in Tissue Engineering**A. L. LARKIN¹, R. M. DAVIS¹, AND P. RAJAGOPALAN¹¹Virginia Tech, Blacksburg, VA**PS-7B-20-245 Development of Gold Nanoparticle Entrapped Polyethylene Terephthalate for Soft Tissue Repair**O. E. WHELOVE¹, AND S. A. GRANT¹¹University of Missouri, Columbia, MO**PS-7B-20-246 Characterization of Salt Templated Hyaluronic Acid Hydrogels for Neural Wound Healing**R. C. THOMAS¹, AND C. E. SCHMIDT¹¹University 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^{1,2}, J. VERNENGO³, Y. JIN², I. FISCHER², B. NEUHUBER², AND A. LOWMAN¹¹Drexel University, Philadelphia, PA, ²Drexel University College of Medicine, Philadelphia, PA, ³Rowan University, Glassboro, NJ**PS-7B-20-248 Bile Acid and Cholesterol Metabolism in 3D Liver Mimics**C. J. DETZEL¹, Y. KIM¹, AND P. RAJAGOPALAN¹¹Virginia Polytechnic Institute and State University, Blacksburg, VA**PS-7B-20-249 Characterizing an Agarose-PEG Interpenetrating Network Hydrogel for Cartilage Tissue Engineering**B. J. DEKOSKY¹, N. H. DORMER¹, G. C. INGAVLE¹, M. S. DETAMORE¹, AND S. H. GEHRKE¹¹University of Kansas, Lawrence, KS**PS-7B-20-250 PDMSstar-PEG Hydrogel Scaffolds with Tunable Properties**B. M. BAILEY¹, K. HUI¹, AND M. A. GRUNLAN²¹Texas A&M University, College Station, TX, ²Texas A&M University, College Station, TX**PS-7B-20-251 Mechanical and Structural Characteristics of Multi-Component Biopolymer Networks**L. HYLAND¹, M. TARABAN¹, AND Y. YU¹¹University of Maryland-College Park, College Park, MD**PS-7B-20-252 Modular PEG Scaffolds: Examination of Microgel Fabrication Conditions and Scaffold Properties**L. VANDIVER¹, J. STUKEL¹, AND R. K. WILLITS^{1,2}¹Saint Louis University, St. Louis, MO, ²University of Akron, Akron, OH**PS-7B-20-253 Double-Gelling Hydrogels for Endovascular Embolization of Aneurysms**H. H. BEARAT¹, C. PAUKEN¹, AND B. L. VERNON¹¹Arizona State University, Tempe, AZ**PS-7B-20-254 Controlling Morphology of Blown Shape Memory Polyurethane Foams**P. SINGHAL¹, T. S. WILSON², AND D. J. MAITLAND¹¹Texas A&M University, College Station, TX, ²Lawrence 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. LEONARD¹, J. R. FUNSTON¹, K. N. CICOTTE^{1,2}, AND E. L. HEDBERG-DIRK¹¹University of New Mexico, Albuquerque, NM, ²Sandia National Laboratories, Albuquerque, NM**PS-7B-20-256 Controlled Deposition of Electrospun Silk Fiber Meshes with Anisotropic Mechanical Properties**R. R. JOSE¹, R. ELIA¹, AND R. A. PEATTIE¹¹Tufts 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. BAKTUR¹, AND S. KWON¹¹Utah State University, Logan, UT**PS-7B-20-258 Self-assembled Three-dimensional Conductive Scaffolds for Stimulated Cell Culture**J-O. YOU¹, M. RAFAT¹, G. YE¹, AND D. T. AUGUSTE¹¹Harvard University, Cambridge, MA**PS-7B-20-259 Novel Bioactive Hydrogels for Aneurysm Treatment**M. RAFAT¹, AND D. T. AUGUSTE¹¹Harvard University, Cambridge, MA**PS-7B-20-260 A Plant (Chinese Yam) Derived Scaffold for Tissue Engineering**L. XIA¹, S. LENAGHAN¹, A. WILLS¹, AND M. ZHANG²¹UTK, Knoxville, TN, ²University of Tennessee, Knoxville, TN**PS-7B-20-261 Development of an In Vitro Model for Studying Corneal Epithelial-Stromal Interactions**W. M. PETROLL¹, L. MA¹, AND D. M. ROBERTSON¹¹Southwestern Medical Center, Dallas, TX**PS-7B-20-262 Engineered Matrix Mimetics Support Assembly of a Growth-Promoting Fibronectin Matrix**D. C. ROY¹, AND D. C. HOCKING¹¹University of Rochester, Rochester, NY**PS-7B-20-263 Thermomechanical Characterization and Model Predictions of a Polyurethane Shape Memory Polymer**B. L. VOLK¹, D. C. LAGOUDAS¹, AND D. J. MAITLAND¹¹Texas 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. DILEO¹, AND W. J. FEDERSPIEL¹¹University of Pittsburgh, Pittsburgh, PA**PS-7B-20-265 Micro-Computed Tomography Characterization of Shape Memory Polymer Foams**J. N. RODRIGUEZ¹, A. MUSCHENBORN¹, F. J. CLUBB¹, T. S. WILSON², AND D. J. MAITLAND¹¹Texas A&M University, College Station, TX, ²Lawrence Livermore National Laboratory, Livermore, CA

PS-7B-20-266 Keratin Biomaterials for Tissue Engineering and Regenerative Medicine ApplicationsJ. ROUSE¹, AND M. VAN DYKE¹¹Wake Forest University School of Medicine, Winston Salem, NC**PS-7B-20-267** Water Absorption Influence on the Properties of Shape Memory PolymerY-J. YU¹, P. SINGHAL¹, T. S. WILSON², AND D. J. MAITLAND¹¹Texas A&M University, College Station, TX, ²Lawrence Livermore National Laboratory, Livermore, CA**PS-7B-20-268** Investigation of Polycaprolactone and Hydroxyapatite Whiskers ScaffoldG. B. CAMARGO CARDOSO¹, P. B. REGO¹, S. L. RAMOS¹, C. A. ZAVAGLIA¹, AND A. F. ARRUDA¹¹Unicamp, Campinas, São Paulo, Brazil**PS-7B-20-269** Designing Fibrin Microthread-Based Scaffolds for Skeletal Muscle RegenerationJ. GRASMAN^{1,2}, C. MALCUI^{2,3}, R. PAGE^{1,3}, T. DOMINKO^{1,3}, AND G. PINS^{1,2}¹Worcester Polytechnic Institute, Worcester, MA, ²Bioengineering Institute, Worcester, MA, ³CellThera Inc., Worcester, MA**PS-7B-20-270** Preparation and Characterization of a Skeletal Muscle ECM ScaffoldM. T. WOLF¹, K. A. DALY¹, AND S. F. BADYLAK¹¹University of Pittsburgh, Pittsburgh, PA**PS-7B-20-271** Hybrid Biomaterials for Biomedical ApplicationsE. REATEGUI¹, L. KASINKAS¹, AND A. AKSAN¹¹University of Minnesota, Minneapolis, MN**PS-7B-20-272** Redox-Initiated Crosslinking of Cellulosic Hydrogels or Soft Tissue AugmentationM. S. GUPTA¹, E. S. COOPER¹, A. T. REZA¹, AND S. B. NICOLL¹¹The 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^{1,2}, D. GALLEGO-PEREZ¹, N. HIGUITA-CASTRO¹, J. JOHNSON¹, J. J. LANNUTTI¹, K. J. GOOCH¹, AND D. J. HANSFORD¹¹The Ohio State University, Columbus, OH, ²Antioquia School of Engineering, Envigado, Antioquia, Colombia**PS-7B-20-274** Role of Ascorbic Acid in S-transnitrosation Reaction - A kinetic AnalysisJ. GU¹, V. MUTHUVIJAYAN², AND R. LEWIS³¹Oklahoma State University, Stillwater, OK, ²Johns Hopkins University, Baltimore, MD, ³Brigham Young University, Provo, UT**PS-7B-20-275** Photo-polymerizable Nitric Oxide-releasing ElastomersY. WANG¹, AND G. A. AMEER^{1,2}¹Northwestern University, Evanston, IL, ²Northwestern University, Chicago, IL**PS-7B-20-276** Mimicking the Extracellular Matrix via Controlled Multiple Thickness Deposition of Electrospun MatsR. ELIA¹, R. R. JOSE¹, AND R. A. PEATTIE¹¹Tufts University, Medford, MA**PS-7B-20-277** Bactericidal Effect of Iron Oxide Nanoparticles on *Staphylococcus aureus*N. L. TRAN¹, A. MIR², D. MALLIK², A. SINHA², S. NAYAR², AND T. J. WEBSTER¹¹Brown University, Providence, RI, ²National Metallurgical Laboratory, Jamshedpur, Jharkhand, India**PS-7B-20-278** Engineering Enabled Biomimetic Corneal StromaS. BANDA¹, AND Y-T. KIM¹¹University of Texas at Arlington, Arlington, TX**PS-7B-20-279** Synthesis and Characterization of Crosslinked Urethane-doped Block Polyester ElastomersA. KOLASNIKOV¹, R. T. TRAN¹, AND J. YANG¹¹The University of Texas at Arlington, Arlington, TX**PS-7B-20-280** Design and Implementation of a Novel Nanofiber Dural SubstituteM. R. MACEWAN¹, J. XIE¹, W. Z. RAY¹, D. SIEWE¹, AND Y. XIA¹¹Washington University, Saint Louis, MO**PS-7B-20-281** Adjustment of Hydrogel Scaffold Properties to Induce Responses of Corneal Epithelial CellsL. REIS¹, AND P. SIT¹¹Louisiana Tech University, Ruston, LA**PS-7B-20-282** Laser Microfabricated Poly(glycerol Sebacate) Scaffolds for Heart Valve Tissue EngineeringN. MASOUMI¹, A. JEAN¹, A. PARKAR¹, AND G. C. ENGELMAYR¹¹The Pennsylvania State University, University Park, PA**PS-7B-20-283** Engineered Basal Lamina: Fabrication and Its Biomedical ApplicationsS. BANDA¹, S. VASUDEVAN¹, D. TAMULY¹, AND Y-T. KIM¹¹University of Texas at Arlington, Arlington, TX**PS-7B-20-284** Studies on Silicon Stabilized Nano-sized alpha-Tricalcium Phosphate Based CementsP. KUMTA¹, AND A. ROY¹¹University of Pittsburgh, Pittsburgh, PA**PS-7B-20-285** The Role of Magnesium Substitution on the Properties and *In Vitro* Bioactivity of Brushite CementsP. KUMTA¹, S. SINGH¹, AND A. ROY¹¹University of Pittsburgh, Pittsburgh, PA**PS-7B-20-286** Mechanical and Cellular Response to Biomineralization of Ovalbumin Scaffolds for Bone Tissue EngineeringK. T. SHEETS¹, AND A. W. MORGAN¹¹Virginia Tech, Blacksburg, VA**PS-7B-20-287** Structural Transition Induced by Mechanical Shear in a Novel Peptide-Amphiphile SystemK. MEGLEY¹, W. SUH¹, AND M. TIRRELL¹¹UC Berkeley, Berkeley, CA**PS-7B-20-288** Tissue Density Culture in a GAG-based Microcapsules as a Foundation for Modular Tissue EngineeringR. T. ANNAMALAI¹, D. R. ARMANT¹, AND H. W. MATTHEW¹¹Wayne State University, Detroit, MI**PS-7B-20-289** Vapor-Phase Nano-Textured Coating of Biocompatible Organic Films on Solid State SurfacesS. VIDYALA¹, S. GOYAL², Y-T. KIM¹, AND S. M. IOBAL¹¹University of Texas Arlington, Arlington, TX, ²Life 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 InterfaceS. SAMAVEDI¹, A. S. GOLDSTEIN¹, S. A. GUELCHER², AND A. W. MORGAN¹¹Virginia Polytechnic Institute & State University, Blacksburg, VA, ²Vanderbilt University, Nashville, TN**1:45PM OP-7-2-1B Electrospun Scaffolds with Depth-wise Chemical and Mechanical Gradients to Increase Cell Infiltration**H. G. SUNDARARAGHAVAN¹, AND J. A. BURDICK¹¹University of Pennsylvania, Philadelphia, PA**2:00PM OP-7-2-1C Oxygen Generating Biomaterials for Ischemic Tissue Salvage and Function**C. L. WARD^{1,2}, B. T. CORONA¹, J. J. YOO¹, B. S. HARRISON^{1,2}, AND G. J. CHRIST^{1,2}¹Wake Forest University Health Sciences, Winston-Salem, NC, ²School of Biomedical Engineering and Sciences, Winston-Salem, NC**2:15PM OP-7-2-1D Development of Fully Biodegradable Polymeric "Quantum Dots"**Y. ZHANG¹, R. TRAN¹, D. GYAWALI¹, AND J. YANG¹¹University of Texas at Arlington, Arlington, TX**2:30PM OP-7-2-1E Ruthenium Catalyzed Cross-Linking of Engineered Arterial Tissue**J. W. BJORK¹, AND R. T. TRANQUILLO¹¹University of Minnesota, Minneapolis, MN**2:45PM OP-7-2-1F Development of Synthetic Viruses for Tissue Regenerating Materials**S-W. LEE^{1,2}, W. CHUNG¹, AND S. YOO¹¹University of California, Berkeley, Berkeley, CA, ²Lawrence 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 StressJ. CZUPRYNA¹, AND A. TSOURKAS¹¹University of Pennsylvania, Philadelphia, PA**1:45PM OP-7-2-2B Ratiometric BiMolecular Beacons for the Sensitive Detection of RNA in Single Living Cells**X. ZHANG¹, A. K. CHEN¹, A. SHAH¹, M. A. BEHLKE², AND A. TSOURKAS¹¹University of Pennsylvania, Philadelphia, PA, ²Integrated DNA Technologies, Inc., Coralville, IA**2:00PM OP-7-2-2C A Novel Fluorogenic Probe for Imaging Endogenous Proteins in Living Cells**S. DUBLIN¹, Y. ZHANG¹, Z. ZHENG¹, AND G. BAO¹¹Georgia Institute of Technology, Atlanta, GA**2:15PM OP-7-2-2D Design of Reactive Fluorogenic Probes for Imaging Small Molecules**N. K. DEVARAJ¹, S. HILDERBRAND¹, AND R. WEISSLEDER¹¹Massachusetts General Hospital, Boston, MA**2:30PM OP-7-2-2E Imaging Multiple Fluorophore Lifetimes with Diffuse Optical Tomography**R. NOTHDURFT¹, M. BEREZIN¹, S. ACHILEFU¹, AND J. CULVER¹¹Washington 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. BARNES¹, J. BRISON¹, D. G. CASTNER¹, AND B. D. RATNER¹¹University 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-1R. WONG^{1,2}, X. CHEN¹, T. LIU^{1,2}, Y. A. YANG³, Y. WANG^{1,2}, AND M. M. JIN^{1,2}¹Cornell University, Ithaca, NY, ²Cornell University - Weill Medical College, New York, NY, ³Ocean Nanotech, LLC, Springdale, AR**1:45PM OP-7-2-3B Ultrasonic Evaluation of Tumor Response to VEGF Blockade using Size-Selected Microbubbles**S. R. SIRSI¹, C. C. CHEN¹, S. L. HERNANDEZ², J. HUANG², T. B. JOHUNG², D. J. YAMASHIRO², J. J. KANDEL², S. HOMMA², AND M. A. BORDEN²¹Columbia University, New York, NY, ²Columbia 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. GHAGHADA¹, R. BHAVANE¹, M. SRIVASTAVA¹, G. ESPINOSA¹, AND A. ANNAPRAGADA¹¹The University of Texas Health Science Center, Houston, TX**2:15PM OP-7-2-3D Development of Cancer Enzyme Triggered Fluorescent Nano-Contrast Agent**J. WANG¹, S. BISWAS¹, M. NANTZ¹, S. ACHILEFU², AND K. A. KANG¹¹University of Louisville, Louisville, KY, ²Washington 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. JUNG¹, AND B. ANVARI¹¹University of California, Riverside, Riverside, CA**2:45PM OP-7-2-3F Mesoporous Silicon Magnetic Nanoconstructs as superior MRI Contrast Agents**R. SETHI¹, J. ANANTA¹, X. LIU², J. BANKSON³, M. FERRARI², L. WILSON¹, AND P. DECUZZI²¹Rice University, Houston, TX, ²University of Texas - HSCH, Houston, TX, ³MD 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 InjuryR. KIRSCH¹¹Case Western Reserve University, Cleveland, OH

1:45PM OP-7-2-4B Decoding Simple Grasp Movements from the Human Subdural ElectroencephalogramS. ACHARYA¹, M. S. FIFER¹, H. L. BENZ¹, N. E. CRONE¹, AND N. V. THAKOR¹¹Johns Hopkins University, Baltimore, MD**2:00PM OP-7-2-4C** The Target Achievement Control Test: Evaluating real-time myoelectric pattern recognition controlA. M. SIMON¹, L. J. HARGROVE^{1,2}, B. A. LOCK¹, AND T. A. KUIKEN^{1,2}¹Rehabilitation Institute of Chicago, Chicago, IL, ²Northwestern University, Chicago, IL**2:15PM OP-7-2-4D** Peripheral Nerve Electrodes in Clinical ApplicationsD. J. TYLER¹¹Case Western Reserve University, Cleveland, OH**2:30PM OP-7-2-4E** Differential Activity of Pudendal Nerve Afferents During MicturitionP. B. YOO¹, AND W. M. GRILL¹¹Duke University, Durham, NC**2:45PM OP-7-2-4F** Functional Stimulation of Peripheral Motor Axons Via Neuroregenerative Sieve MicroelectrodesM. R. MACEWAN¹, E. ZELLMER¹, D. SIEWE¹, J. WHEELER¹,S. SAKIYAMA-ELBERT¹, AND D. MORAN¹¹Washington 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. SPANGLER¹, AND K. D. WITTRUP¹¹Massachusetts 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. STONE¹, L. CHANTRANUPONG¹, C. GONZALES¹, AND G. GEORGIU¹¹University of Texas at Austin, Austin, TX**2:00PM OP-7-2-5C** Investigating the Aggregation, Structure, and Activity of DNA Binding bZip Peptide AmphiphilesR. MARULLO¹, AND M. TIRRELL²¹University of California, Santa Barbara, Berkeley, CA, ²University of California, Berkeley, Berkeley, CA**2:15PM OP-7-2-5D** Engineering High Affinity Knottin Peptides Targeting Tumor Marker CAIX for Cancer ImagingS. J. MOORE¹, AND J. R. COCHRAN¹¹Stanford University, Stanford, CA**2:30PM OP-7-2-5E** Modification of Adeno-Associated Virus Capsid Conformational Change Behavior Using Error-Prone PCRM. A. MUSICK^{1,2}, K. I. MCCONNELL¹, C. CHEN¹, AND J. SUH¹¹Rice University, Houston, TX, ²Baylor College of Medicine, Houston, TX**2:45PM OP-7-2-5F** Micropatterning of Aptamer Beacons to Create Cytokine-Sensing SurfacesN. TULEUOVA^{1,2}, J. SEO¹, E. RAMANULOV², AND A. REVZIN¹¹University of California, Davis, CA, ²National 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. CHANDLER¹, M. SAUNDERS¹, D. GOURDON¹, AND C. FISCHBACH¹¹Cornell University, Ithaca, NY**1:45PM OP-7-2-6B** Cytoskeletal Fluidization Potentiates cell Realignment During Uniaxial Cyclic Cell StretchingA. L. IORDAN¹, R. KRISHNAN², N. MIZRAHI², K. RAJENDRAN², A. MARINKOVIC², J. P. BUTLER², J. J. FREDBERG², AND D. STAMENOVIC¹¹Boston University, Boston, MA, ²Harvard School of Public Health, Boston, MA**2:00PM OP-7-2-6C** Effect of DDR Receptors on Mechanical Properties of Extracellular MatrixS. M. TABBAA¹, A. BLISSETT¹, L. SIVAKUMAR¹, M. STEVENSON¹, A. MORSS¹, G. P. LAFYATIS¹, K. GOOCH¹, AND G. AGARWAL¹¹The 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. LAIB¹, B. DHAMANKAR¹, AND W. GUILFORD¹¹University of Virginia, Charlottesville, VA**2:30PM OP-7-2-6E** The Role of Nuclear-Cytoskeletal Coupling in Intracellular Force TransmissionM. L. LOMBARDI¹, D. JAALOUK¹, C. SHANAHAN², K. ROUX³, AND J. LAMMERDING¹¹Brigham and Women's Hospital/Harvard Medical School, Cambridge, MA, ²King's College London, London, United Kingdom, ³University of Florida, Gainesville, FL**2:45PM OP-7-2-6F** 3D Multiscale Molecular Model of Muscle Contraction and RelaxationS. M. MIJALOVICH^{1,2}, O. KAYSER-HERALD¹, R. J. GILBERT², AND M. A. GEEVES³¹Harvard School of Public Health, Boston, MA, ²Caritas St. Elizabeth's Medical Center, Boston, MA, ³University 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^{1,2}, T. DESPLANTEZ², N. A. GEISSE¹, H. HINNEN², A. G. KLEBER², AND K. K. PARKER^{1,3}¹Disease Biophysics Group, School of Engineering and Applied Sciences, Harvard University, Cambridge, MA, ²Department of Physiology, University of Bern, Bern, Switzerland, ³Wyss 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^{1,2}, M. D. BRIGHAM^{1,2}, A. W. FEINBERG^{1,2}, P. W. ALFORD^{1,2}, S. P. SHEEHY^{1,2}, A. GROSBERG^{1,2}, J. A. GOSS^{1,2}, AND K. K. PARKER^{1,2}¹Disease Biophysics Group, School of Engineering and Applied Sciences, Harvard University, Cambridge, MA, ²Wyss 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. LIAU¹, N. CHRISTOFOROU¹, K. LEONG¹, AND N. BURSAC¹¹Duke University, Durham, NC

2:15PM OP-7-2-7D Optogenetic Control of Human Pluripotent Stem Cell-Derived Cardiomyocytes

O. ABILEZ¹, J. J. BAUGH¹, M. L. GORREPATI¹, C. LEE-MESSER¹, M. HUANG¹, R. PRAKASH¹, K. D. WILSON¹, F. JIA¹, J. YU¹, J. C. WU¹, K. DEISSEROTH¹, AND C. K. ZARINS¹

¹Stanford University, Stanford, CA

2:30PM OP-7-2-7E Simultaneous Optical Mapping of Transmembrane Potential and Wall Motion in Isolated, Perfused Hearts

E. B. BOURGEOIS¹, A. D. BACHTEL¹, G. P. WALCOTT¹, AND J. M. ROGERS¹

¹University of Alabama at Birmingham, Birmingham, AL

2:45PM OP-7-2-7F Role of iPLA2 Activation in the Response of the Diabetic Rat Heart to Acute Ischemia

P. RAHNEMA¹, Y. SHIMONI¹, AND A. NYGREN¹

¹University of Calgary, Calgary, Alberta, Canada

Track: Cardiovascular Engineering - 7-2-8**Cardiovascular Fluid Dynamics - II**

Chairs: Jonathan Butcher, Alison Marsden

Room 18D

1:30PM OP-7-2-8A Lymph Transport in Rat Mesenteric Lymphatics Experiencing Edemagenic Stress

E. RAHBAR¹, T. AKL¹, D. C. ZAWIEJA², G. L. COTE¹, AND J. E. MOORE JR.¹

¹Texas A&M University, College Station, TX, ²Texas A&M Health Science Center, Temple, TX

1:45PM OP-7-2-8B Changes in Wall Shear Stress Generated by Outflow Tract Banding in the Hearts of Chick Embryos

A. LIU¹, A. TROYER¹, X. YIN¹, Z. MA¹, A. NICKERSON¹, R. WANG¹, K. THORNBURG¹, AND S. RUGONYI¹

¹Oregon Health & Science University, Portland, OR

2:00PM OP-7-2-8C Hemodynamic Patterning of Avian Embryonic Heart

H. C. YALCIN¹, A. SHEKHAR¹, K. BHARADWAJ¹, AND J. T. BUTCHER¹

¹Cornell University, Ithaca, NY

2:15PM OP-7-2-8D Characterization of the Outflow Tract-Aortic Arch Angle During Embryonic Development in the Chick

W. J. KOWALSKI¹, N. C. TESLOVICH¹, O. DUR¹, B. B. KELLER², AND K. PEKKAN¹

¹Carnegie Mellon University, Pittsburgh, PA, ²Cardiovascular Innovation Institute, University of Louisville, Louisville, KY

2:30PM OP-7-2-8E Achieving an Optimal Hepatic Flow Distribution Via a Customized Y-graft Design for the Fontan Surgery

A. L. MARSDEN¹, W. YANG¹, I. VIGNON-CLEMENTEL², AND J. A. FEINSTEIN³

¹UCSD, La Jolla, CA, ²INRIA, Cedex, France, ³Stanford University, Palo Alto, CA

2:45PM OP-7-2-8F A Lumped Parameter Model for the Measurement of O₂ and CO₂ Concentration in Congenital Heart Defects

W. J. KOWALSKI¹, O. DUR¹, AND K. PEKKAN¹

¹Carnegie Mellon University, Pittsburgh, PA

Track: Orthopedic and Rehabilitation Engineering – 7-2-9**Orthopedic Biomaterials**

Chairs: Ed Botchwey, Kurt Kasper, Helen Lu

Room 17A

1:30PM OP-7-2-9A Bacteriocidal Ultrasound Therapy is Enhanced with Antibacterial Nanomaterials

J. T. SEIL¹, AND T. J. WEBSTER¹

¹Brown University, Providence, RI

1:45PM OP-7-2-9B Development and Optimization of a Biodegradable Bone Cement for Clinical Applications

A. HENSLEE¹, D-H. GWAK¹, A. MIKOS¹, AND F. KASPER¹

¹Rice University, Houston, TX

2:00PM OP-7-2-9C Keratin Biomaterials with BMPs Promote Bone Regeneration and Gap Bridging in a Critical-size Defect

R. DE GUZMAN¹, J. SAUL^{1,2}, M. ELLENBURG¹, T. SMITH¹, AND M. VAN DYKE¹

¹Wake Forest University Health Sciences, Winston-Salem, NC, ²Virginia Tech - Wake Forest University, Winston-Salem, NC

2:15PM OP-7-2-9D A Novel Injectable Porous Hydrogel Composite Scaffold for Bone Tissue Engineering

P. NAIR¹, D. GYAWALI¹, R. TRAN¹, AND J. YANG¹

¹University of Texas at Arlington, Arlington, TX

2:30PM OP-7-2-9E Development of Hybrid Scaffolds for Bone Tissue Engineering

Y. KANG¹, A. SCULLY², D. YOUNG¹, S. KIM¹, H. TSAO¹, AND Y. YANG^{1,2}

¹University of Texas Health Science Center at Houston, Houston, TX, ²Rice University, Houston, TX

2:45PM OP-7-2-9F Chondrocyte Response in Hydrogel-Ceramic Scaffolds for Osteochondral Interface Regeneration

M. K. BOUSHELL¹, N. T. KHANARIAN¹, AND H. H. LU¹

¹Columbia University, New York, NY

Track: Systems Biology, Bioinformatics and Computational Biology – 7-2-10**Signals and Networks in Cancer and Disease – I**

Chairs: Markus Covert, Melissa Kemp

Room 17B

1:30PM OP-7-2-10A Global Transcriptomics Analysis Reveals Gene-pair Decision Rules to Differentiate Major Brain Diseases

J. SUNG¹, P-J. KIM¹, D. GEMAN², AND N. PRICE¹

¹University of Illinois at Urbana-Champaign, Urbana, IL, ²Johns Hopkins University, Baltimore, MD

1:45PM OP-7-2-10B Bcl-2 and XIAP Inhibit Apoptosis by Modulating Intrinsic Variations in the Mitochondrial Pathway

S. RAYCHAUDHURI¹, A. NAIR¹, J. SKOMMER², AND T. BRITAIN²

¹University of California Davis, Davis, CA, ²The University of Auckland, Auckland, New Zealand

2:00PM OP-7-2-10C Multiplexed Cell Signaling Data for Constrained Fuzzy Logic Modeling

D. C. CLARKE¹, AND D. A. LAUFFENBURGER¹

¹Massachusetts 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 Cancer

C-C. WANG¹, AND K. JANES¹

¹University of Virginia, Charlottesville, VA

2:30PM OP-7-2-10E Coupled Signaling Loops are Responsible for Generating Synchronized Oscillations in BMP/TGF Axes

B. GRABIAS¹, AND K. KONSTANTOPOULOS¹

¹Johns Hopkins University, Baltimore, MD

2:45PM OP-7-2-10F Simulations of Competing Neuroprotective and Vascular Effects of VEGF in ALS

Y. L. HASHAMBHOY¹, AND F. MAC GABHANN¹

¹Johns 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. GREEN¹, D. SUN², A. HAFEZI-MOGHADAM², K. LASHKARI³, AND S. K. MURTHY¹
¹Northeastern University, Boston, MA, ²Massachusetts Eye and Ear Infirmary and Harvard Medical School, Boston, MA, ³Schepens Eye Research Institute, Boston, MA

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

A. D. RADADIA¹, Y-S. LIU¹, N. PRIVOROTSKAYA¹, C. STAVIS², H. ZENG³, J. A. CARLISLE³, R. J. HAMERS², W. P. KING¹, AND R. BASHIR¹
¹University of Illinois, Urbana, IL, ²University of Wisconsin - Madison, Madison, WI, ³Advanced Diamond Technologies, Inc., Romeoville, IL

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

Y. HU¹, Y. PENG¹, L. BROUSSEAU¹, AND M. FERRARI¹
¹The 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. MAK¹, C. REINHART-KING¹, AND D. ERICKSON¹
¹Cornell University, Ithaca, NY

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

C. P. TAN¹, K. E. CENICCOLA¹, K. SZETO¹, D. M. LIN¹, AND H. G. CRAIGHEAD¹
¹Cornell University, Ithaca, NY

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

C-M. CHENG¹, X. LIU¹, K. MIRICA¹, C. MACE¹, AND G. WHITESIDES¹
¹Harvard 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. CHANG¹, E. SALM^{1,2}, N. N. WATKINS^{1,2}, Y-S. JIN^{2,3}, AND R. BASHIR^{1,2}
¹Micro and Nanotechnology Laboratory, Urbana, IL, ²University of Illinois at Urbana-Champaign, Urbana, IL, ³Institute for Genomic Biology, Urbana, IL

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

B. WANG¹, P. KUMNORKAEW¹, M. WOLFE¹, A. WELDON¹, C. TIBALDI¹, J. GILCHRIST², AND X. CHENG¹
¹Lehigh University, Bethlehem, PA, ²Lehigh University, Bethlehem, PA

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

P. KASHANI¹, AND P. KAVEHPOUR¹
¹UCLA, Los Angeles, CA

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

M. B. SANO¹, E. HENSLEE¹, H. SHAFIEE¹, AND R. V. DAVALOS¹
¹Virginia Tech, Blacksburg, VA

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

H. AMINI^{1,2}, E. SOLLIER^{1,2}, AND D. DI CARLO^{1,2}
¹University of California, Los Angeles, Los Angeles, CA, ²California NanoSystems Institute, Los Angeles, CA

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

S. AGASTINI¹, U-B. T. GIANG², L. DELOUISE², AND M. KING¹
¹Cornell University, Ithaca, NY, ²University 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. SHARMA¹, W. MA², J. PANYAM³, I. ADJEI¹, S. DIMITRIJEVIC¹, AND V. LABHASETWAR¹
¹Lerner Research Institute, Cleveland Clinic, Cleveland, OH, ²Moore's Cancer Center, University of California San Diego, La Jolla, CA, ³University of Minnesota, College of Pharmacy, Minneapolis, MN

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

Y. REN¹, A. AGRAWAL¹, G. VON MALTZAHN¹, V. FOGAL², H. CHEUNG³, E. RUOSLAHTI², W. C. HAHN², AND S. N. BHATIA^{4,5}
¹Massachusetts Institute of Technology, Cambridge, MA, ²Burnham Institute for Medical Research, Santa Barbara, CA, ³Dana-Farber Cancer Institute/Broad Institute/BWH, Cambridge, MA, ⁴MIT/HST/BWH, Cambridge, MA, ⁵HHMI, Cambridge, MA

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

N. SINGH¹, A. AGRAWAL¹, A. K. LEUNG¹, P. A. SHARP¹, AND S. N. BHATIA^{1,2}
¹MIT, Cambridge, MA, ²Howard Hughes Medical Institute, Cambridge, MA

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

P. K. BROWN¹, A. T. QURESHI¹, D. J. HAYES¹, AND W. T. MONROE¹
¹Louisiana 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. LIECHTY¹, AND N. A. PEPPAS¹
¹The 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. WILSON¹, G. DALMASSO², D. MERLIN², AND N. MURTHY³
¹Georgia Tech, Atlanta, GA, ²Emory University, Atlanta, GA, ³Georgia 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. PASZEK¹, C. DUFORT¹, J. LAKINS¹, J. HUDAK², C. R. BERTOZZI^{2,3}, D. A. HAMMER⁴, AND V. M. WEAVER¹
¹University of California, San Francisco, San Francisco, CA, ²University of California, Berkeley, Berkeley, CA, ³Lawrence Berkeley National Laboratory, Berkeley, CA, ⁴University of Pennsylvania, Philadelphia, PA

1:45PM OP-7-2-14B Spatial Regulation of Host-tumor Cell InteractionsE. BOGHAERT¹, AND C. M. NELSON¹¹Princeton University, Princeton, NJ**2:00PM OP-7-2-14C** - Invading Tumor Cells Take Advantage of Interstitial Flow-induced Matrix Priming by FibroblastsA. C. SHIEH¹, H. A. ROZANSKY¹, M. SENEVIRATNE¹, AND M. A. SWARTZ¹¹Ecole 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. ALFORD¹, E. BATCHELDER², D. YARAR², F. B. GERTLER¹, AND D. A. LAUFFENBURGER¹¹MIT, Cambridge, MA, ²Whitehead Institute, Cambridge, MA**2:30PM OP-7-2-14E** Isolation of Circulating Tumor Cells from Cancer Patients using a Microfluidic Vortex GeneratorS. L. STOTT¹, C-H. HSU¹, D. T. MIYAMOTO¹, S. M. ROTHENBERG¹, S. NAGRATH¹, R. J. LEE¹, L. V. SEQUIST¹, S. MAHESWARAN¹, D. A. HABER¹, AND M. TONER¹¹Massachusetts General Hospital, Charlestown, MA**2:45PM OP-7-2-14F** Engineering Growth Factor Ligands as Cancer Diagnostics and TherapeuticsN. PAPO¹, D. S. JONES¹, A. P. SILVERMAN¹, AND J. R. COCHRAN¹¹Stanford 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. MOYA¹, Y-H. HSU¹, C. C. HUGHES¹, A. P. LEE¹, AND S. C. GEORGE¹¹University of California, Irvine, Irvine, CA**1:45PM OP-7-2-15B** - Micro-patterned Substrates for Cardiac Tissue EngineeringS-K. PARK¹, H-D. PARK¹, K. NA¹, S. YANG¹, E-S. YOON¹, AND J. KIM¹¹Nano-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. CUCHIARA¹, AND J. L. WEST¹¹Rice University, Houston, TX**2:15PM OP-7-2-15D** - Endothelial Progenitor Cell Migration is Directed by Gradients of SDF and VEGFE. M. ANDERSON^{1,2}, D. HUH², AND D. J. MOONEY^{1,2}¹Harvard University, Cambridge, MA, ²Wyss Institute, Boston, MA**2:30PM OP-7-2-15E** - Tuning Directed Cell Motility on Micropatterns through Pattern Geometry and Signal AlterationsK. KUSHIRO¹, S. CHANG¹, AND A. R. ASTHAGIRI¹¹California 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. HWANG¹, S-G. IM¹, R. S. LANGER¹, AND D. G. ANDERSON¹¹Massachusetts 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. HOFFMANN¹, J. CULVER², M. DICKINSON², AND J. WEST¹¹Rice University, Houston, TX, ²Baylor College of Medicine, Houston, TX**1:45PM OP-7-2-16B** *In Vivo* Imaging of Microvascular Network Development in a Tissue Engineered ConstructG. GRUIONU¹, Z. GALIS¹, T. SECOMB², AND J. B. HOYING³¹Indiana University School of Medicine, Indianapolis, IN, ²University of Arizona, Tucson, AZ,³University of Louisville, Louisville, KY**2:00PM OP-7-2-16C** Engineering the Synergy Between Growth Factors and Integrins for AngiogenesisM. M. MARTINO¹, AND J. A. HUBBELL¹¹Swiss 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^{1,2}, Y. HONG^{1,2}, W. HE^{1,2}, D. W. CHEW^{1,2}, J. RENDEMONTI^{1,2}, W. R. WAGNER^{1,2}, AND D. A. VORP^{1,2}¹University of Pittsburgh, Pittsburgh, PA, ²McGowan 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. SYEDAIN¹, L. MEIER¹, A. LEE¹, AND R. TRANQUILLO¹¹University of Minnesota, Minneapolis, MN**2:45PM OP-7-2-16F** Cellular and Biomechanical Analysis of an *In Vitro* Cultured Small Diameter Blood VesselP. S. MCFETRIDGE¹¹University 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. ALMARZA¹, B. BROWN¹, W. CHUNG¹, C. KUNKLE¹, S. HENDERSON¹, AND S. BADYLAK¹¹University 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. MA¹, M. SMETANA¹, L. LARKIN¹, T. KOSTROMINOVA², E. WOJTYTS¹, AND E. ARRUDA¹¹University of Michigan, Ann Arbor, MI, ²Indiana 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. SNYDER¹, J. O'CONNOR², J. RICCI³, AND K. UHRICH¹¹Rutgers University, Piscataway, NJ, ²University of Medicine and Dentistry of New Jersey, Newark, NJ, ³New York University, New York, NY

2:15PM OP-7-2-17D Zonal Chondrocyte Response to Growth Factor Delivery and Matrix MoleculesE. E. COATES¹, AND J. P. FISHER¹¹University 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. SIMSON¹, AND J. ELISSEFF¹¹Johns Hopkins University, Baltimore, MD**2:45PM OP-7-2-17F** Poroelastic Material Properties of Hydrogels and Cartilage Evaluated Using UltrasoundJ. WALKER¹, J. M. MANSOUR¹, A. I. CAPLAN¹, V. M. GOLDBERG¹, AND J. F. WELTER¹¹Case 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. BATES¹¹University of Vermont, Burlington, VT**4:15PM OP-7-3-1B** Effects of Intratidal Overdistention and Derecruitment on Global Lung Mechanics: A Simulation StudyR. AMINI¹, AND D. W. KACZKA¹¹Beth Israel Deaconess Medical Center, Boston, MA**4:30PM OP-7-3-1C** Computational Model of Pulmonary Small Airways InterdependenceH. FUJIOKA¹, D. HALPERN², AND D. P. GAVER III¹¹Tulane University, New Orleans, LA, ²University of Alabama, Tuscaloosa, AL**4:45PM OP-7-3-1D** A Multi-scale Model of Regional Perfusion in the Human Pulmonary CirculationM. TAWHAI¹, A. CLARK¹, AND K. BURROWES²¹University of Auckland, Auckland, Auckland, New Zealand, ²Oxford 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. SUKI¹, H. PARAMESWARAN¹, A. MAJUMDAR¹, V. COTTIN², J-F. CORDIER³, AND J. H. BATES⁴¹Boston University, Boston, MA, ²Lyon University, Lyon, France, ³Université Claude Bernard, Lyon, France, ⁴University of Vermont, Burlington, VT**5:15PM OP-7-3-1F** Dynamic Length Scale Behavior of Ventilation in a Model of BronchoconstrictionT. WINKLER^{1,2}, A. BRAUNE¹, AND J. G. VENEGAS¹¹Massachusetts General Hospital, Boston, MA, ²Harvard 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^{1,2}, M. ORESCANIN^{1,2}, AND M. INSANA^{1,2}¹University of Illinois at Urbana-Champaign, Urbana, IL, ²Beckman Institute of Advanced Science and Technology, Urbana, IL**4:15PM OP-7-3-2B** Real-Time Hyperspectral Endoscope for Early Cancer DiagnosticsR. T. KESTER¹, N. BEDARD¹, AND T. S. TKACZYK¹¹Rice University, Houston, TX**4:30PM OP-7-3-2C** Optical Imaging of Ovarian CarcinogenesisJ. BARTON¹¹The 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. PANDE¹, S. SHRESTA¹, J. PARK¹, B. E. APPLGATE¹, AND J. A. JO¹¹Texas 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. MOHS¹, M. C. MANCINI¹, J. M. PROVENZALE^{1,2}, S. SINGHAL³, M. D. WANG¹, AND S. NIE¹¹Emory - Georgia Tech, Atlanta, GA, ²Duke University, Durham, NC, ³University of Pennsylvania, Philadelphia, PA**5:15PM OP-7-3-2F** How Multiphoton Imaging Will Revolutionize Intraoperative Surgical DecisionsW. ZIPFEL¹, AND R. WILLIAMS¹¹Cornell 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. WANG¹, J. MANCUSO², B. WILLSEY¹, X. LI², L. MA¹, K. P. JOHNSTON¹, M. D. FELDMAN², AND T. E. MILNER¹¹University of Texas at Austin, Austin, TX, ²University 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. PHIPPS¹, N. HATAMI¹, J. JO¹, M. C. FISHBEIN², T. PAPAIOANNOU³, Q. FANG³, J. BAKER², AND L. MARCU¹¹University of California, Davis, Davis, CA, ²University of California, Los Angeles, Los Angeles, CA, ³Cedars Sinai Medical Center, Los Angeles, CA**4:30PM OP-7-3-3C** Multifunctional Nanoclusters for Imaging Plaque-Based MacrophagesB. W. WILLSEY¹, L. L. MA¹, T. WANG¹, V. SAPOZHNIKOVA², J. MANCUSO^{2,3}, J. T. JENKINS², A. BORWANKAR¹, D. RIGDON¹, M. FELDMAN^{2,3}, T. MILNER¹, AND K. JOHNSTON¹¹University of Texas at Austin, Austin, TX, ²University of Texas Health Science Center San Antonio, San Antonio, TX, ³South 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. POURMORTEZA¹, A. C. LARDO¹, D. HERZKA¹, J. L. PRINCE¹, AND E. R. MCVEIGH¹¹Johns 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. EYERLY¹, T. D. BAHNSON², S. J. HSU³, D. P. BRADWAY¹, G. E. TRAEHY^{1,2}, AND P. D. WOLF¹¹Duke University, Durham, NC, ²Duke University Medical Center, Durham, NC, ³Siemens Healthcare, Issaquah, WA**5:15PM OP-7-3-3F** A Semi-automated Approach to Mitral Valve Morphometry Using Real-time 3D EchocardiographyA. M. POUCH¹, P. A. YUSHKEVICH¹, B. M. JACKSON¹, J. H. GORMAN¹, R. C. GORMAN¹, AND C. M. SEHGAL¹¹University 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. PATEL¹, A. SRIDHARAN¹, AND J. MUTHUSWAMY¹¹Arizona State University, Tempe, AZ

4:15PM OP-7-3-4B Electrical Activity Promotes Neuronal Survival and RegenerationJ. GOLDBERG¹, AND R. G. CORREDOR¹¹University of Miami, Miami, FL**4:30PM OP-7-3-4C** Three-Dimensional Gradients of Immobilized FactorsS. SEIDLITS¹, E. RITSCHDORFF¹, D. HERNANDEZ¹, E. SPIVEY¹, C. SCHMIDT¹, AND J. SHEAR¹¹University 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. YANG¹, S. LIU², AND N. THAKOR¹¹Johns Hopkins University, Baltimore, MD, ²Kennedy Krieger Institute, Baltimore, MD**5:00PM OP-7-3-4E** Novel Partially-biodegradable Neural Probe and Biocompatible Tissue ResponseM. HAN¹, D. B. MCCREERY¹, AND P. S. MANOONKITWONGSA¹¹Huntington 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. MILMAN¹, Z. Z. KHAING¹, S. A. GEISSLER¹, AND C. E. SCHMIDT¹¹University 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. KANG¹, S. JUNG¹, AND G. GEORGIU¹¹The University of Texas at Austin, Austin, TX**4:15PM OP-7-3-5B** Toward Novel Molecular Sensors: Incorporating Unnatural Amino Acids in Stem CellsK. MONCIVAIS¹, L. XIANG¹, AND Z. J. ZHANG¹¹University of Texas at Austin, Austin, TX**4:30PM OP-7-3-5C** Development of a Novel Fibrin Binding Peptide for Incorporation Into BiomaterialsJ. J. RICE¹, M. MARTINO¹, S. KONTOS¹, AND J. HUBBELL¹¹EPFL, Lausanne, Switzerland**4:45PM OP-7-3-5D** Influence on Pertussis Toxin Intracellular Trafficking by AntibodiesJ. N. SUTHERLAND¹, AND J. A. MAYNARD¹¹The 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. SONG¹, AND J. LIAO¹¹University of California, Riverside, Riverside, CA**5:15PM OP-7-3-5F** Determining Self-Assembly Mechanism of a Protein NanocageT. PENG¹, AND S. LIM¹¹Nanyang 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. HSU¹, C.-F. LEE¹, A. LOCKE¹, S. Q. VANDERZYL¹, AND R. R. KAUNAS¹¹Texas A&M, College Station, TX**4:15PM OP-7-3-6B** Glycated Substrate Altering Endothelial Cell Response to Fluid Shear StressS. F. KEMENY¹, AND A. M. CLYNE¹¹Drexel University, Philadelphia, PA**4:30PM OP-7-3-6C** Defining the Gene Expression Changes Required for Morphogenesis of Engineered TissuesK. LEE¹, AND C. M. NELSON¹¹Princeton University, Princeton, NJ**4:45PM OP-7-3-6D** Tissue Assembly Requires Sensitivity to Matrix Mechanics and Differential ECM AssemblyJ. P. CALIFANO¹, AND C. A. REINHART-KING¹¹Cornell University, Ithaca, NY**5:00PM OP-7-3-6E** A Genetic Strategy for Graded, Dynamic Control of Cell-matrix MechanobiologyJ. MACKAY¹, A. KEUNG¹, AND S. KUMAR¹¹University of California, Berkeley, CA**5:15PM OP-7-3-6F** Effects of Fluid Flow on TGF-Beta I Signaling in Human Mesenchymal Stem CellsR. DIOP¹, AND S. LI¹¹University 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. PAHLEVAN¹, AND M. GHARIB¹¹California Institute of Technology, Pasadena, CA**4:15PM OP-7-3-7B** In Vitro Vasospasms: Acute Traumatic Injury and Vascular HypercontractilityP. W. ALFORD^{1,2}, J. A. GOSS^{1,2}, M. D. BRIGHAM^{1,2}, A. W. FEINBERG^{1,2}, AND K. K. PARKER^{1,2}¹Disease Biophysics Group, Harvard University, Cambridge, MA, ²Wyss 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^{1,2}, J. A. PHILLIPPI^{1,3}, S. C. WATKINS^{1,3}, T. G. GLEASON^{1,3}, AND D. A. VORP^{1,3}¹University of Pittsburgh, Pittsburgh, PA, ²RiMED Foundation, Palermo, Italy, Italy,³McGowan 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. XENOS¹, D. PETER¹, X. LIANG¹, I. LAVI², Y. ALEMU¹, S. EINAV¹, AND D. BLUESTEIN¹¹Stony Brook University, Stony Brook, NY, ²Tel Aviv University, Tel Aviv, Israel

5:00PM OP-7-3-7E Cerebral Artery Blood Flow As Source of Outer Ear Canal Acoustic EmissionsP. RICHARDSON¹, R. LEVINE², AND Y. YU¹¹Brown University, Providence, RI, ²Mass Eye & Ear Inst, Boston, MA**5:15PM OP-7-3-7F** Effect of Isoflurane on Brain Oxygen Autoregulation in RabbitsJ. EASSA¹, J. LAKHOO¹, P. HAN¹, D. AKSENOV^{2,3}, A. WYRWCZ^{2,3}, AND R. A. LINSENMEIER¹¹Northwestern University, Evanston, IL, ²NorthShore University HealthSystem, Evanston, IL, ³University 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. YUEN¹, N. R. DU¹, AND D. J. MOONEY¹¹Harvard University, Cambridge, MA**4:15PM OP-7-3-8B** 3D Angiogenic Sprouting Controlled by Adhesive Ligands and MMP-susceptibility in PEG-Peptide HydrogelsJ. S. MILLER¹, C. J. SHEN¹, W. R. LEGANT¹, J. D. BARANSKI¹, B. L. BLAKELY¹, AND C. S. CHEN¹¹University 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. MEISNER¹, S. S. BAJIKAR¹, AND R. J. PRICE¹¹University of Virginia, Charlottesville, VA**4:45PM OP-7-3-8D** Barrier Properties and Endothelial Cells – Pericytes Interactions within Microvascular ScaffoldsY. ZHENG¹, N. W. CHOI¹, A. DIAZ-SANTANA¹, M. CRAVEN¹, S. S. VERBRIDGE¹, C. FISCHBACH-TESCHL¹, AND A. D. STROOCK¹¹Cornell University, Ithaca, NY**5:00PM OP-7-3-8E** Wrapping-and-Tapping Anastomosis between Implanted Endothelial Networks and Host VasculatureG. CHENG¹, S. LIAO¹, H-K. WONG¹, D. LACORRE¹, E. DI TOMASO², P. AU³, R. K. JAIN¹, D. FUKUMURA¹, AND L. L. MUNN⁴¹Massachusetts General Hospital, Boston, MA, ²Novartis, Cambridge, MA, ³FDA, Boston, MA, ⁴Harvard Medical School, Charlestown, MA**5:15PM OP-7-3-8F** Hemodynamic Systems Analysis of Capillary Network Remodeling During the Progression Type 2 DiabetesK. F. BENEDICT¹, G. COFFIN¹, E. J. BARRETT¹, AND T. C. SKALAK¹¹University 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. SIKAVITSAS¹, B. ENGBRETSON¹, W. YATES¹, AND R. ABOUSLEIMAN²¹University of Oklahoma, Norman, OK, ²Oklahoma 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. HWANG¹, AND A. H. HSIEH^{1,2}¹University of Maryland, College Park, MD, ²University of Maryland, Baltimore, MD**4:30PM OP-7-3-9C** Development of 3D Culture Conditions for Bone Marrow Mesenchymal Stem CellsB. MCGOWAN¹, AND J. NAGATOMI¹¹Clemson University, Clemson, SC**4:45PM OP-7-3-9D** Distraction Osteogenesis in Organ CultureM. SAUNDERS¹, J. VAN SICKELS¹, B. HEIL¹, AND K. GURLEY¹¹University of Kentucky, Lexington, KY**5:00PM OP-7-3-9E** Tensile Stretch Inhibits BMP4 Mediated Mesenchymal Stem Cell AdipogenesisJ. LEE¹, AND J. LIM¹¹University of Nebraska, Lincoln, NE**5:15PM OP-7-3-9F** Effect of Estrogen Deficiency on Osteocyte Lacunar Density and Canalicular NumberD. SHARMA¹, J. D. LEVY¹, S. B. DOTY², AND S. P. FRITTON¹¹City College of New York, New York, NY, ²Hospital 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. PAN¹, AND M. W. DEEM¹¹Rice 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. MAYNARD¹, E. BIRCH¹, M. GUTSSHOW¹, AND M. COVERT¹¹Stanford University, Palo Alto, CA**4:30PM OP-7-3-10C** Interplay of Lineage-Specific Receptor and Transcription Factor during ErythropoiesisS. PALANI¹, AND C. A. SARKAR¹¹University of Pennsylvania, Philadelphia, PA**4:45PM OP-7-3-10D** Robust Network Topologies for Generating Switch-like Cellular ResponsesN. A. SHAH¹, AND C. A. SARKAR²¹University of Pennsylvania School of Medicine, Philadelphia, PA, ²University of Pennsylvania, Philadelphia, PA**5:00PM OP-7-3-10E** Cross Reactive Aptamer Microarrays, a New Approach to Differential SensingS. STEWART¹, A. SYRETT¹, A. ELLINGTON¹, AND E. ANSLYN¹¹University of Texas, Austin, TX**5:15PM OP-7-3-10F** Quantifying Metabolic Diversity: Environmental Constraints on Metabolic ProductionP. A. JENSEN¹, AND J. A. PAPIN¹¹University 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. BENFORD¹, M. WANG¹, B. REINEMUND¹, T. GOOD², J. KAMEOKA¹, AND G. COTÉ¹
¹Texas A&M University, College Station, TX, ²University 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. GOPAL¹, L. D'AMICO², K. HOSHINO¹, P. R. GASCOYNE², AND X. J. ZHANG¹
¹The University of Texas at Austin, Austin, TX, ²University 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. GLEGHORN¹, S. M. SANTANA¹, E. D. PRATT¹, M. S. LOFTUS², M. JODARI-KARIMI², N. H. BANDER², D. M. NANUS², P. GIANNAKAKOU², AND B. J. KIRBY¹
¹Cornell University, Ithaca, NY, ²Weill Cornell Medical College, New York, NY

4:45PM OP-7-3-11D Precision Microfluidic Oscillators for On-Chip Timing and Control
P. DUNCAN¹, T. NGUYEN¹, AND E. HUI¹
¹University of California, Irvine, Irvine, CA

5:00PM OP-7-3-11E Label-free Microarray Imaging for Screening Infectious Diseases
S. AHN¹, G. DAABOUL¹, Q. CAO¹, E. OZKUMUR², C. M. KLAPPERICH¹, M. CABODI¹, AND S. UNLU¹
¹Boston University, Boston, MA, ²Massachusetts 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. PENG¹, A. CARROLL², Y. HU¹, Y. FLORES¹, T. TANAKA¹, A. BOUAMRANI¹, A. SOOD², AND M. FERRARI^{1,2}
¹The University of Texas Health Science Center at Houston, Houston, TX, ²The 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. HOOD¹, M. A. KOSOGLU¹, Y. CHEN¹, Z. MONTGOMERY¹, AND C. G. RYLANDER¹
¹Virginia Tech, Blacksburg, VA

4:15PM OP-7-3-12B Engineering Two-dimensional Paper Networks For Improved Paper-based Assay Performance
E. FU¹, B. LUTZ¹, P. KAUFFMAN¹, AND P. YAGER¹
¹University of Washington, Seattle, WA

4:30PM OP-7-3-12C Microfluidic Screening Chip for Detection of Circulating Tumor Cell
Y-Y. HUANG¹, K. HOSHINO¹, A. HORTON¹, D. MALIK¹, J. TAM¹, K. SOKOLOV¹, E. FRENKEL², J. UHR², N. LANE², AND X. ZHANG¹
¹The University of Texas at Austin, Austin, TX, ²The 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. TSE¹, D. R. GOSSETT¹, S. LEE¹, A. T. CLARK¹, AND D. DI CARLO¹
¹University 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. DHUMMAKUPT¹, P. SAMSON¹, D. MARKOV¹, J. WIKSWO¹, AND L. SHOR²
¹Vanderbilt University, Nashville, TN, ²University of Connecticut, Storrs, CT

5:15PM OP-7-3-12F Investigating Bacterial Chemotaxis Toward Human Neuroendocrinal Hormone in a Microfluidics Model
D. N. KIM¹, M. HEGDE¹, D. ENGLERT¹, AND A. JAYARAMAN¹
¹Texas 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. LIU¹, S. HOLLEN¹, J. TONEY¹, T. HERBERT¹, AND K. M. HABERSTROH¹
¹Brown University, Providence, RI

4:15PM OP-7-3-13B CLIMB GK-12 Fellows: Bringing BME to the K-12 Classroom
J. R. WEISER¹, L. AUSTEN², AND D. PUTNAM¹
¹Cornell University, Ithaca, NY, ²Southside High School, Elmira, NY

4:30PM OP-7-3-13C Middle School Students Explore Biomedical Engineering within the Context of Diabetes
S. M. PEARCE¹, V. FITZPATRICK¹, J. BAZIL¹, J. GROH¹, AND A. E. RUNDELL¹
¹Purdue University, West Lafayette, IN

4:45PM OP-7-3-13D Museum as Mechanism and Model
A. HAWK¹
¹National Museum of Health and Medicine, Washington, DC

5:00PM OP-7-3-13E The Possibilities Beyond
J. V. CURLEY¹
¹National 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. FAGETTE¹
¹BMES, 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. QUAN¹, Z. CHEN¹, AND J. TIAN¹
¹Duke University, Durham, NC

4:15PM OP-7-3-14B Development of a Constitutive Promoter Library to Evaluate and Optimize Gene Expression Levels
J. FERREIRA¹, R. PEACOCK¹, AND C. WANG¹
¹Stanford University, Stanford, CA

4:30PM OP-7-3-14C Programming Gene Regulation: from Synthetic Gene Networks to Cell DifferentiationX. WANG¹¹Arizona State University, Tempe, AZ**4:45PM OP-7-3-14D** Engineering a Functional Genetic Approach for Small Molecule CharacterizationJ. R. PRITCHARD¹, H. JIANG², L. GILBERT¹, D. LAUFFENBURGER¹, AND M. HEMANN^{1,2}¹M.I.T., Cambridge, MA, ²Koch Institute, Cambridge, MA**5:00PM OP-7-3-14E** Design of Anti-Cancer Bacterial TherapeuticsJ. C. ANDERSON¹¹UC Berkeley, Berkeley, CA**5:15PM OP-7-3-14F** Tunable Signal Processing in Synthetic MAP Kinase ModulesE. C. O'SHAUGHNESSY¹, S. PALANI², J. J. COLLINS¹, AND C. A. SARKAR²¹Howard Hughes Medical Institute and Boston University, Boston, MA, ²University 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. Garvin¹, D. C. Hocking¹, and D. Dalecki¹¹University of Rochester, Rochester, NY**4:15PM OP-7-3-16B** Engineering Epithelial/Stromal Interactions to Study Branching MorphogenesisS. MANIVANNAN¹, A. PAVLOVICH¹, AND C. NELSON¹¹Princeton University, Princeton, NJ**4:30PM OP-7-3-16C** Spatially Patterning Cell Adhesion Ligands in Biodegradable, Photocrosslinked Alginate HydrogelsO. JEON¹, C. POWELL¹, AND E. ALSBERG¹¹Case Western Reserve University, Cleveland, OH**4:45PM OP-7-3-16D** Rapid, Versatile Printing of Vascular Networks for Perfused 3D Tissue CultureJ. S. MILLER¹, M. T. YANG¹, D-H. NGUYEN¹, AND C. S. CHEN¹¹University of Pennsylvania, Philadelphia, PA**5:00PM OP-7-3-16E** Tissue OrigamiG. YE¹, J-O. YOU¹, AND D. T. AUGUSTE¹¹Harvard University, Cambridge, MA**5:15PM OP-7-3-16F** Long-term Viability of Cells Encapsulated in 3D Photopatterned Hydrogels Fabricated using StereolithographyP. ZORLUTUNA¹, V. CHAN¹, J. JEONG¹, H. KONG¹, AND R. BASHIR¹¹University 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. WARDEN¹, AND A. TSOURKAS¹¹University of Pennsylvania, Philadelphia, PA**PS-8A-1-2 Transient Absorption Ultrasonic Microscopy**R. L. SHELTON¹, AND B. E. APPLGATE¹¹Texas A&M University, College Station, TX**PS-8A-1-3 Multiplex Photoacoustic Imaging for Molecular Imaging of Cancerous Tumors Using Targeted Nanorods**C. L. BAYER¹, Y-S. CHEN¹, S. KIM¹, S. MALLIDI¹, K. SOKOLOV^{1,2}, AND S. Y. EMELIANOV¹¹The University of Texas at Austin, Austin, TX, ²The 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. QUEK¹¹Duke University, Durham, NC**PS-8A-1-5 Applications of Potential Dependent DNA Orientation on Indium Tin Oxide Surface by Fluorescent-self Interference Microscopy**P. SPUHLER¹, L. SOLA², M. MONROE¹, M. CHIARI², AND M. UNLU¹¹Boston University, Boston, MA, ²CNR, Milan, Milan, Italy**PS-8A-1-6 Real-Time Observation of Rad51 Nucleoprotein Filament Formation**Y. QIU¹, AND S. MYONG¹¹University of Illinois at Urbana-Champaign, Urbana, IL**PS-8A-1-7 Alternating-color Nanoparticles for Particle Tracking**G. RUAN¹, AND J. O. WINTER¹¹The Ohio State University, Columbus, OH**PS-8A-1-8 Characterization of Solid State Photomultipliers in PET Detector Designs**J. SCHMALL¹, E. RONCALI¹, J. CHRISTIAN², P. DOKHALE², K. SHAH², AND S. CHERRY¹¹UC Davis, Davis, CA, ²Radiation Monitoring Devices, Inc., Watertown, MA**PS-8A-1-9 Image Analysis Methods for Whole Cell cryo-Electron Tomography Data**K. WANG¹, C-Y. FU², P. C. DOERSCHUK¹, AND J. E. JOHNSON²¹Cornell University, Ithaca, NY, ²The Scripps Research Institute, La Jolla, CA**PS-8A-1-10 Design of pH Sensitive MR Contrast Agents for Tumor Imaging**S. CRAYTON¹, AND A. TSOURKAS¹¹University of Pennsylvania, Philadelphia, PA**PS-8A-1-11 Molecular Specific Biocompatible Gold Nanorods for Non-invasive Imaging and Therapy**P. P. JOSHI¹, Y-S. CHEN¹, S. J. YOON¹, S. EMELIANOV¹, AND K. SOKOLOV^{1,2}¹University of Texas at Austin, Austin, TX, ²MD Anderson Cancer Center, Houston, TX**PS-8A-1-12 Effects of Temperature on the Fluorescence Quantum Yield of Nano-Encapsulated ICG**S. GUPTA¹, K. THENKONDAR¹, H. MEHTA¹, B. BAHMANI¹, V. VULLEV¹, AND B. ANVARI¹¹University of California, Riverside, CA**PS-8A-1-13 Quantum Dot-Fluorescent Protein Fluorescence Resonance Energy Transfer Probe for Chloride Sensing**D. SOTTO¹, AND G. BAO¹¹Georgia Institute of Technology, Atlanta, GA

PS-8A-1-14 MRI Contrast Agents: Nanoparticle Contrast Agent Enhancement Through Control of Particle GeometryS. A. KHAN¹, L. SUN¹, AND A. CAPITANO¹¹University of Houston, Houston, TX**PS-8A-1-15 Enhanced Excitation of Multiple Fluorophores by Sub-10fs Laser Pulses for Two-photon Microscopy**C. WANG¹¹Texas 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. ELAHI¹, Z. LIU¹, K. LUKER¹, G. LUKER¹, AND T. WANG¹¹University of Michigan, Ann Arbor, MI**PS-8A-1-17 Immunoliposomes-Vehicles for Molecular Imaging of Inflamed Endothelium**D. DANILA¹, M. LACKEY², S. CASSCELLS¹, AND J. L. CONYERS¹¹UTHealth, Houston, TX, ²Howrey LLP, Houston, TX**PS-8A-1-18 Sensitivity of Detection of Biological AFM for Gold-Labeled Liposomes at HCAEC Membranes**J. L. CONYERS¹, A. ZASK¹, D. DANILA¹, AND E. B. GOLUNSKI¹¹UTHealth, 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. FLAMM¹, T. SINNO¹, AND S. L. DIAMOND¹¹University of Pennsylvania, Philadelphia, PA**PS-8A-2-21 Cardiac Cell Culture Model to Study Cardiomyocytes under Physiological Loads**M-D. T. NGUYEN¹, R. ESTRADA¹, G. GIRIDHARAN¹, S. D. PRABHU¹, AND P. SETHU¹¹University of Louisville, Louisville, KY**PS-8A-2-22 Modeling Mechanical Heart Function**J. L. PALLADINO¹, AND A. NOORDERGRAAF²¹Trinity College, Hartford, CT, ²University of Pennsylvania, Philadelphia, PA**PS-8A-2-23 Effects of Geometric Variations on the Buckling of Arteries**P. DATIR¹, A. NORTHCUTT¹, AND H-C. HAN¹¹University 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. YIN¹, R. HARIHARAN¹, F. ROUF¹, S. SHANMUGAVELAYUDAM¹, AND D. A. RUBENSTEIN¹¹Oklahoma State University, Stillwater, OK**PS-8A-2-25 Computational Geometric Analysis of the Normal and Hypertensive Human Right Ventricle**J. WU¹, J. C. BRIGHAM¹, M. A. SIMON¹, S. TRIPATHY¹, K. KIM¹, AND M. SACKS¹¹University of Pittsburgh, Pittsburgh, PA**PS-8A-2-26 Model Simulated Impacts of Elevated Cytosolic Na⁺ on Ca²⁺ Handling, Mitochondrial Energetics and Reactive Oxygen Species in Guinea Pig Myocytes**L. ZHOU¹, A-C. WEI¹, T. LIU¹, S. CORTASSA¹, R. WINSLOW¹, AND B. O'ROURKE¹¹Johns Hopkins University, Baltimore, MD**PS-8A-2-27 Microfluidic Devices to Study the Effect of Atherogenic Flow Pattern on Cultured Endothelial Cells**R. ESTRADA¹, V. PARICHEHREH¹, M-D. NGUYEN¹, AND P. SETHU¹¹University of Louisville, Louisville, KY**PS-8A-2-28 Calibration of Abdominal Aortic Aneurism Models Using In Vivo Velocimetry Measurements**M. A. MCELROY¹, G. MIHAI², Y. DING², S. RAJAGOPALAN^{2,3}, O. P. SIMONETTI^{2,3}, AND S. N. GHADIALI^{1,2}¹The Ohio State University, Columbus, OH, ²Davis Heart and Lung Research Institute, Columbus, OH, ³Richard M. Ross Heart Hospital, Columbus, OH**PS-8A-2-29 Microstructurally Motivated Constitutive Modeling of the Developing Mouse Aorta**J. K. CHENG¹, J. E. WAGENSEIL², AND R. P. MECHAM¹¹Washington University, St. Louis, MO, ²Saint Louis University, St. Louis, MO**PS-8A-2-30 Characterization of Microcalcifications in Coronary Artery Disease**N. MALDONADO MARTINEZ¹, A. KELLY¹, S. CHAKRABORTI¹, Y. VENGRENKYU², L. CARDOSO¹, AND S. WEINBAUM¹¹City College of New York, New York, NY, ²New York University, New York, NY**PS-8A-2-31 Numerical Study of Fluid-Structure Interaction in a Developing Chick Heart**A. FALAHATPISHEH¹, H. ALAVI¹, S. J. STINSON¹, L. JUNOR¹, R. L. GOODWIN¹, AND A. KHERADVAR¹¹University of South Carolina, Columbia, SC**PS-8A-2-32 Pumping During Fetal Cardiac Development: Peristaltic or Impedance?**J. MORAVEJI¹, S. BIECHLER¹, J. W. WEIDNER¹, R. L. GOODWIN¹, L. JUNOR¹, AND A. KHERADVAR¹¹University of South Carolina, Columbia, SC**PS-8A-2-33 Multiscale Modeling of Blood Rheology in a Developing Heart: When Granularity Matters**J. MORAVEJI¹, S. BIECHLER¹, J. W. WEIDNER¹, R. L. GOODWIN¹, AND A. KHERADVAR¹¹University 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. CHEHELTANI¹, J. M. ROSANO¹, N. E. D'SOUZA¹, B. WANG¹, N. PLESHKO¹, AND M. F. KIANI¹¹Temple University, Philadelphia, PA**PS-8A-3-35 Molecular Electrophysiological Differences Between Genders in the Nonfailing Human Heart**C. M. AMBROSI¹, N. MOAZAMI², J. M. NERBONNE², AND I. R. EFIMOV¹¹Washington University in St. Louis, St. Louis, MO, ²Washington University School of Medicine, St. Louis, MO**PS-8A-3-36 Method for Ex Vivo Assessment of Functional Myocardial Mechanics**O. M. BENAVIDES¹, AND J. G. JACOT^{1,2}¹Rice University, Houston, TX, ²Texas Children's Hospital, Houston, TX**PS-8A-3-37 Comparison of Cardiac Wall Motion and Strain Patterns During Dobutamine Stress-Induced Ischemia**K. M. PARKER¹, AND J. W. HOLMES¹¹University of Virginia, Charlottesville, VA**PS-8A-3-38 Characterization of Dyssynchrony in Contraction Strain Pattern**C. M. NAZZALI¹, J. C. CRISCIONE², AND L. MULLIGAN³¹Texas A&M University, College Station, TX, ²Texas A&M University, College Station, TX, ³Medtronic, Inc., Mounds View, MN**PS-8A-3-39 A Micromechanics Model for Myocardium-Vessel Interaction in Perfused Myocardium**Y. LIU¹, H. CHEN¹, X. ZHAO¹, AND G. S. KASSAB¹¹Indiana University-Purdue University, Indianapolis, IN

PS-8A-3-40 The Structural and Biomechanical Properties of Porcine Myocardial Extracellular MatrixB. WANG¹, D. MCCOLLUM¹, M. E. TEDDER², D. T. SIMIONESCU², F. TO¹, A. L. CURRY³, L. WILLIAMS¹, AND J. LIAO¹¹Mississippi State University, Mississippi State, MS, ²Clemson University, Clemson, SC, ³University of Memphis, Memphis, TN**PS-8A-3-41** Cardiac Myocyte Response to Engineered Extracellular MatrixV. LIN¹, A. CHOPRA², P. JAMNEY³, AND J. KRESH¹¹Drexel University College of Medicine, Philadelphia, PA, ²Drexel University, Philadelphia, PA, ³University 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. FORSYTH¹, P. D. OWRUTSKY¹, J. WAN², AND H. A. STONE²¹Harvard University, Cambridge, MA, ²Princeton University, Princeton, NJ**PS-8A-4-43** Tyrosine Phosphorylation of Endothelial Cell–Cell Adhesion Proteins Induced by Shear Stress GradientN. SAKAMOTO¹, H. XIAOBO¹, AND M. SATO¹¹Tohoku University, Sendai, Miyagi, Japan**PS-8A-4-44** Mitochondrial Network Morphology in Postischemic Vascular Endothelial CellsR. J. GIEDT¹, M. PRAETORIUS-IBBA¹, A. MATZAVINOS², AND B. R. ALEVRIADOU¹¹The Ohio State University, Columbus, OH, ²Iowa State University, Ames, IA**PS-8A-4-45** Differential Endothelial Cell Response to Simultaneous Shear and Cytokine StimulationR. B. HUANG¹, AND O. ENIOLA-ADEFESO²¹University of Michigan, Ann Arbor, MI, ²University 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. SHI¹, AND J. M. TARBELL¹¹City 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. LOPEZ¹, AND J. M. TARBELL¹¹The 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. HUANG¹, AND B. P. HELMKE¹¹University of Virginia, Charlottesville, VA**PS-8A-4-49** Biochemical and Biophysical Factors Regulate Inflammation Due to Systemic InfectionS. J. EVANI¹, N. MAREEDU¹, A. MURTHY¹, B. P. ARULANANDAM¹, AND A. K. RAMASUBRAMANIAN¹¹University of Texas at San Antonio, San Antonio, TX**PS-8A-4-50** Smooth Muscle Cell Behavior in Non-uniform Stretch EnvironmentsW. J. RICHARDSON¹, R. P. METZ², E. M. WILSON², AND J. E. MOORE JR.¹¹Texas A&M University, College Station, TX, ²Texas A&M Health Science Center, College Station, TX**PS-8A-4-51** Extracellular Matrix Control of Flow-Induced Structural DynamicsR. E. EVANS¹, AND B. P. HELMKE¹¹University of Virginia, Charlottesville, VA**PS-8A-4-52** Shear Stress Modulates RAGE Expression and Activation in Human Aortic Endothelial CellsJ. S. DEVERSE¹, AND A. G. PASSERINI¹¹University 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. SYKES¹, S. GIRI¹, AND W. CHAN¹¹University of Toronto, Toronto, ON, Canada**PS-8A-5-54** Cholesterol-dependent Phase Separation in Cell Derived Giant Plasma Membrane VesiclesI. LEVENTAL¹, F. J. BYFIELD², T. BAUMGART², AND P. JANMEY²¹Max Planck Institute for Cell Biology and Genetics, Dresden, Germany, ²University of Pennsylvania, Philadelphia, PA**PS-8A-5-55** Cooperative Effects in the Ordered Assembly of Collagen Layers on MicaW. LEOW¹, AND W. HWANG¹¹Texas A&M University, College Station, TX**PS-8A-5-56** Adeno-associated Virus (AAV) Engineering for Enhanced Specificity of Disease-Targeted Viral Gene VectorsJ. JUDD¹, P. NGUYEN¹, J. SILBERG¹, AND J. SUH¹¹Rice University, Houston, TX**PS-8A-5-57** Real-time Detection of the TRAIL-DR4 Activation Using FRET in a DR4 Reporter Cell LineZ. DERELI-KORKUT¹, H. GANDHOK¹, X. JIANG², AND S. WANG¹¹City College of New York, New York, NY, ²Memorial 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. DUQUE¹, AND M. MOBED-MIREMADI²¹San Jose State University, San Jose, CA, ²San Jose State University, San Jose, CA**PS-8A-5-59** CNT-Oxidoreductase Enzyme Conjugates for Biosensors and Biofuel CellsO. A. KARUNWI¹, AND A. GUISEPPI-ELIE²¹Clemson University, Anderson, SC, Afghanistan, ²Clemson University, Clemson, SC**PS-8A-5-60** Molecular Biomechanics of the Kinesin Neck Linker DomainS. SHASTRY¹, AND W. O. HANCOCK¹¹Penn State University, University Park, PA**PS-8A-5-61** Load-dependent Transport of Sub-Cellular Commodities by Multiple Motor ProteinsD. K. JAMISON¹, J. W. DRIVER¹, A. R. ROGERS¹, P. E. CONSTANTINOU¹, AND M. R. DIEHL¹¹Rice University, Houston, TX**PS-8A-5-62** Engineered Peptide Binding ScFv to Chaperone Membrane Protein CrystallizationJ. C. PAI¹, AND J. A. MAYNARD¹¹University of Texas at Austin, Austin, TX**PS-8A-5-63** What Governs the Interaction Between Warfarin and Cyclodextrins?J. M. VASQUEZ¹, S. BAE², B. KIM², G. UPADHYAYULA¹, S. GUPTA¹, A. VU¹, A. HASHEMI¹, J. S. SCHULTZ¹, AND V. I. VULLEV¹¹University of California, Riverside, Riverside, CA, ²Kyung 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. TONG¹, S. HOU¹, AND G. BAO¹¹Georgia 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. BARENDT¹, AND C. A. SARKAR¹¹University of Pennsylvania, Philadelphia, PA**PS-8A-5-66** Programming Enzyme-free DNA Reaction Circuits for Ultra Low-cost Molecular DiagnosisX. CHEN¹, G. ECKHOFF¹, AND B. LI¹¹University of Texas at Austin, Austin, TX**PS-8A-5-67** A Versatile Thermally-directed Cross-linking Platform for Facile Modification of Tissue ScaffoldsS. Y. KWAN¹, L. A. ERNST¹, S. K. ANDREKO¹, B. T. BALLOU¹, AND P. G. CAMPBELL¹¹Carnegie Mellon University, Pittsburgh, PA**PS-8A-5-68** Quantifying the Tension-lipid Packing Relationship Using Fluorescence Lifetime of DilH. MUDDANA¹, T. TABOUILLOT¹, H. CHIANG¹, AND P. J. BUTLER¹¹Penn State University, University Park, PA**PS-8A-5-69** Design and Implementation of a FRET-based High-Throughput Screening Technology in SumoylationR. L. MELLO¹, R. LAUHEAD¹, Y. SONG¹, V. MADAHAR¹, Y. LIU¹, AND J. LIAO¹¹University of California Riverside, Riverside, CA**PS-8A-5-70** Coarse-Grained Molecular Dynamics of Myosin II and Structural Dynamics of Nucleotide PocketE. A. KHATIBLOU¹, S. KREUZER¹, C-C. LIU¹, J. MARQUEZ¹, J. ZHOU¹, AND T. J. MOON¹¹UT-Austin, Austin, TX**PS-8A-5-71** Mapping Foldome Changes with Cysteine Labeling Kinetics Measured by Mass SpectrometryB. CHASE¹, D. PANTANO², J. PAJEROWSKI³, H-Y. TANG⁴, D. SPEICHER⁴, AND D. DISCHER²¹University of Pennsylvania, Philadelphia, PA, ²University of Pennsylvania, Philadelphia, PA, ³Merck, Whitehouse Station, NJ, ⁴Wistar 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. SHRIRAO¹, AND R. PEREZ-CASTILLEJOS¹¹NJIT, Newark, NJ**PS-8A-6-73** Nanofluidic Flow Proteometry for the Determination of Biomarker ConcentrationJ. KAMEOKA¹¹Texas A&M University, College Station, TX**PS-8A-6-74** Computational and Experimental Techniques to Optimize a Micromixer for an Antibody-based SensorK. L. HAMLINGTON¹, H. FUJIOKA¹, D. A. BLAKE¹, R. CORTEZ¹, AND D. P. GAVER¹¹Tulane University, New Orleans, LA**PS-8A-6-75** Push Valve for Microfluidic DevicesM-E. BRETT¹, S. ZHAO¹, J. L. STOIA¹, G. MITTAL¹, AND D. T. EDDINGTON¹¹University 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. RAO¹, U. TATA¹, P. SINGHAL², S. SINGHAL³, S. AWASTHI⁴, K. T. NGUYEN¹, AND J-C. CHIAO⁵¹The Univ. of Texas at Arlington, Arlington, TX, ²Arlington High School, Arlington, TX, ³UNT Health Science Center, Fort Worth, TX, ⁴UNT Health Science Center, Fort Worth, TX, ⁵The Univ. of Texas at Arlington, Arlington, TX**PS-8A-6-77** Migration of PC-3 Cells Under the Influence of Various EGF ConcentrationsS. SALODKAR¹, U. TATA¹, S. RAO¹, K. T. NGUYEN¹, AND J-C. CHIAO¹¹The Univ. of Texas at Arlington, Arlington, TX**PS-8A-6-78** Microfluidics Made EasyV. NUÑEZ¹, B. MILLARE², S. SHIN¹, K. CHAU¹, A. LIN¹, AND V. I. VULLEV¹¹University of California, Riverside, Riverside, CA, ²Johns Hopkins University, Baltimore, MD**PS-8A-6-79** Optimizing Microfluidic Devices for Immobilization of *C. elegans* for High-Throughput ScreensI. D. CACERES¹, AND H. LU¹¹Georgia Institute of Technology, Atlanta, GA**PS-8A-6-80** Lateral Cavity Acoustic Transducers (LCATs) for Cell and Particle Sorting ApplicationsM. V. PATEL¹, A. R. TOVAR¹, R. LIN¹, S-Y. TEH¹, AND A. P. LEE¹¹University 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. ELLIOTT¹, L. YOU¹, AND F. YUAN¹¹Duke University, Durham, NC**PS-8A-6-82** Exploiting Osmosis for Size-based Separation of Blood Cells into Subpopulations using MicrofluidicsV. PARICHEHREH¹, K. K. BHAVANAM¹, AND P. SETHU¹¹University of Louisville, Louisville, KY**PS-8A-6-83** A Novel, High-Throughput, Single-Cell Deformability Measurement Technique For Diagnostics And TherapeuticsH. T. TSE¹, D. R. GOSSETT¹, S. LEE¹, A. T. CLARK¹, AND D. DI CARLO¹¹University of California, Los Angeles, Los Angeles, CA**PS-8A-6-84** What Determines the Quality of Adhesion between Poly(Dimethylsiloxane) and Glass Surfaces?K. CHAU¹, B. MILLARE², A. P. LIN¹, V. NUÑEZ¹, AND V. I. VULLEV¹¹University of California, Riverside, Riverside, CA, ²Johns Hopkins University, Baltimore, MD**PS-8A-6-85** A Switchable Microfluidic Serial Dilution Circuit for Constant Flow Rate Tissue PerfusionA. K. AU¹, H. A. ARNSON², C. G. SIP¹, T. E. HOLY², AND A. FOLCH¹¹University of Washington, Seattle, WA, ²Washington University in St. Louis, St. Louis, MO**PS-8A-6-86** Nanoscale Diffusivity Measurement DeviceJ. S. GILL¹, A. GRATTONI¹, A. ZIEMYS¹, AND M. FERRARI^{1,2}¹University of Texas at Houston Medical School, Houston, TX, ²University of Texas M.D. Anderson Cancer Center, Houston, TX**PS-8A-6-87** Increased Viscosity for Decreased Settling in Microfluidic Circulating Tumor Cell DiagnosticsC. LAUNIERE¹, S. HONG¹, AND D. EDDINGTON¹¹University of Illinois at Chicago, Chicago, IL**PS-8A-6-88** Automated Dielectrophoretic Characterization of MycobacteriaC. HUANG¹, B. G. HAWKINS¹, S. ARASANIPALAI¹, AND B. J. KIRBY¹¹Cornell University, Ithaca, NY**PS-8A-6-89** Cell Dosing on Subsecond Time Scales Using a Laminar-Flow DeviceM. M. ROBINSON¹, S. MOORJANI¹, T. HOPPE¹, AND J. B. SHEAR¹¹University of Texas at Austin, Austin, TX**PS-8A-6-90** Measurement and Regulation of On-Chip Oxygen Partial PressureP. C. THOMAS^{1,2}, S. R. RAGHAVAN², AND S. P. FORRY¹¹National Institute of Standard and Technology, Gaithersburg, MD, ²University of Maryland, College Park, MD

PS-8A-6-91 Characterization of Microfluidic Calorimeter for Measuring Small Dynamic Temperature ChangesV. L. KOPPARTHY¹, S. M. TANGUTOORU¹, R. GUMMA¹, G. G. NESTOROVA¹, AND E. J. GUILBEAU¹¹Louisiana Tech University, Ruston, LA**PS-8A-6-92** Fluid Flow Characterization of Micro- and Nanochanneled Silicon MembranesE. ZABRE¹, J. GILL¹, A. GRATTONI¹, A. ZIEMYS¹, AND M. FERRARI^{1,2}¹University of Texas Health Science Center at Houston, Houston, TX, ²University of Texas MD Anderson Cancer Center, Houston, TX**PS-8A-6-93** Towards an Order-of-magnitude Increase in Throughput of Small Artery InvestigationS. PINTO¹, S. YASOTHARAN¹, J. VOIGTLÄNDER-BOLZ², S-S. BOLZ¹, AND A. GÜNTHER¹¹University of Toronto, Toronto, Ontario, Canada, ²St. Michael's Hospital, Toronto, Ontario, Canada**PS-8A-6-94** A Novel Microfluidic Assay for Study of Chemotaxis ResponseM. A. TRAORE¹, AND B. BEHKAM¹¹Virginia Tech, Blacksburg, VA**PS-8A-6-95** Droplet Microfluidic System for Biodetection and Cell Growth Studies Using a Hydrodynamic SensorI. SINN¹, P. KINNUNEN¹, B. H. MCNAUGHTON¹, M. A. BURNS¹, AND R. KOPELMAN¹¹University of Michigan, Ann Arbor, MI**PS-8A-6-96** A Miniaturized Device for Non-Destructive Detection of Radiation Damaged CellsB. PRABHAKARPANDIAN¹, K. BHATT¹, M. ACHARY², M. F. KIANI², AND K. PANT¹¹CFD Research Corporation, Huntsville, AL, ²Temple University, Philadelphia, PA**PS-8A-6-97** Micro-Sandwich in Microfluidics: 3D Biopolymer Membranes for Cell AssemblyX. LUO¹, H-C. WU¹, C-Y. TSAO¹, Y. CHENG¹, R. GHODSSI¹, G. F. PAYNE¹, G. RUBLOFF¹, AND W. E. BENTLEY¹¹University of Maryland, College Park, MD**PS-8A-6-98** Mixing Enhancement in Microfluidic Devices Utilizing Contactless Dielectrophoresis (cDEP)A. SALMANZADEH-DOZDABI¹, H. SHAFIEE¹, R. V. DAVALOS¹, AND M. A. STREMLER¹¹Virginia 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. LAN¹, AND D. B. KHISMATULLIN¹¹Tulane University, New Orleans, LA**PS-8A-6-100** A Planar Peristaltic Pump for MicrofluidicsP. GOULD¹, L. HOANG¹, K. SEALE¹, S. DARBY¹, M. MOORE², AND J. WIKSWO¹¹Vanderbilt University, Nashville, TN, ²Sewanee: The University of the South, Sewanee, TN**PS-8A-6-101** Enlarging from Microscale: A Milli-scale Device for Blood and Plasma FractionationV. BHAL¹, AND E. C. ECKSTEIN¹¹University of Memphis, Memphis, TN**PS-8A-6-102** The Influence of Microfluidic Channel Height on Leukocyte Adhesion and Rolling Under FlowP. W. COGHILL¹, E. A. SHIMP¹, E. K. KESSELHUTH¹, AND D. W. SCHMIDTKE¹¹University of Oklahoma, Norman, OK**PS-8A-6-103** Integrated Nanofluidic Channel Device for Biomimic ApplicationsY-T. T. YEH¹, AND S. ZHENG¹¹Pennsylvania State University, University Park, PA**PS-8A-6-104** Investigation of Multivalent Ion Solution Flow Reversal under Travelling Wave ElectroosmosisZ. WANG¹, X. LIU², L. BROUSSEAU², AND M. FERRARI²¹the University of Texas at Austin, Austin, TX, ²University of Texas Health Science Center at Houston, Houston, TX**PS-8A-6-105** High-Throughput Sheathless Flow Cytometry Using Inertial MicrofluidicsA. S. BHAGAT¹, S. S. KUNTAEGOWDANAHALLI¹, AND I. PAPAUSKY¹¹University of Cincinnati, Cincinnati, OH**PS-8A-6-106** Thermoelectric Sensing for Microfluidic DNA Melting AnalysisN. CREWS¹, AND A. GANVEER¹¹Louisiana Tech, Ruston, LA**PS-8A-6-107** Modeling of a Microfluidic Magnetic Particle Fractionation DeviceT. O. TASCI¹, AND B. GALE¹¹University 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. GAJRIA¹, T. NEUMANN², J. WEINSTEIN², D. SCHAFER², AND M. TIRRELL²¹UC Santa Barbara, Berkeley, CA, ²UC 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. LIANG¹, T. W. JENSEN¹, E. J. ROY¹, R. J. DEVOLDER¹, L. A. RUND¹, K. B. TEXTOR¹, L. B. SCHOOK¹, Y. TONG², AND H. KONG¹¹University of Illinois Urbana-Champaign, Urbana, IL, ²National 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. COLACINO¹, H. WANG², S. DONG², M. ROMAN², AND Y. W. LEE¹¹Virginia Tech-Wake Forest University, Blacksburg, VA, ²Virginia Polytechnic Institute and State University, Blacksburg, VA**PS-8A-7-111** Polymeric Platform for Oral Drug Delivery of ChemotherapeuticsC. A. SCHOENER¹¹University of Texas at Austin, Austin, TX**PS-8A-7-112** Giant Amphiphiles Toward Monodispersed, Stable Nanoparticles for Drug Delivery and ImagingH. DONG¹, J. Y. SHU¹, S. LIU¹, AND T. XU¹¹University of California at Berkeley, Berkeley, CA**PS-8A-7-113** Modification of Porous Silicon Particles for Enhanced Protein StabilityE. U. DE ROSA¹, D. FAN¹, C. CHIAPPINI², X. LIU^{1,3}, M. FERRARI^{1,4}, AND E. TASCOTTI¹¹University of Texas HSCH, Houston, TX, ²University of Texas Austin, Austin, TX, ³University of Texas Austin, Austin, TX, ⁴Rice 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. ARGEN¹, G. MANI¹, N. TORRES¹, AND J. L. ONG¹¹University 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-FERNANDEZ¹, R. MANCHANDA¹, T. LEI¹, D. A. CARVAJAL¹, AND A. J. MCGORON¹¹Florida International University, Miami, FL

PS-8A-7-116 Examination of Folate-Targeted Liposomes With Encapsulated Poly(2-propylacrylic acid) as a pH-responsive Nanoplatfom for Cytosolic Drug DeliveryZ. CHENG¹¹University of Pennsylvania, Philadelphia, PA**PS-8A-7-117** Chitosan Microparticles for Drug Delivery ApplicationsL. RODRIGUEZ¹, A. NADARAJAH¹, AND N. CHIAIA¹¹The University of Toledo, Toledo, OH**PS-8A-7-118** Mesoporous Silicon Microparticles for the Sustained Delivery of AntibioticsI. YAZDI¹, C. CHIAPPINI², B. WEINER³, E. TASCIOTTI¹, AND M. FERRARI^{1,2}¹The University of Texas Health Science Center at Houston, Houston, TX, ²The University of Texas at Austin, Austin, TX, ³The Methodist Hospital Research Institute, Houston, TX**PS-8A-7-119** Ultrasonic Nebulization as a Tool for Creating Multilayered, Multicomponent NanoassembliesD. MILLS¹, Y. LVOV¹, K. MCNAMARA¹, AND M. THANGARAJ¹¹Louisiana Tech University, Ruston, LA**PS-8A-7-120** A Novel Dual-agent Loaded PLGA Nanoparticle for the Simultaneous Delivery of Chemotherapy and HyperthermiaY. TANG¹, T. LEI¹, R. MANCHANDA¹, A. NAGESSETTI¹, A. FERNANDEZ-FERNANDEZ¹, AND A. J. MCGORON¹¹Florida International University, Miami, FL**PS-8A-7-121** Synthesis of a Thermally Responsive Curcumin Conjugate for Treating Intervertebral Disc PathologiesS. M. SINCLAIR¹, D. QU¹, X. CHEN¹, E. J. TOONE¹, A. CHILKOTI¹, AND L. A. SETTON¹¹Duke University, Durham, NC**PS-8A-7-122** Model Analysis of Implant Formation and Drug Release from *In Situ* Forming ImplantsR. B. PATEL¹, G. M. SAIDEL¹, AND A. A. EXNER¹¹Case Western Reserve University, Cleveland, OH**PS-8A-7-123** Drug Delivery Potential of Self-Assembled Monolayers on Electropolished L605 Cobalt Chromium AlloyC. R. KAUFMANN^{1,2}, G. MANI², AND C. M. AGRAWAL²¹University of Texas Health Science Center at San Antonio, San Antonio, TX, ²University of Texas at San Antonio, San Antonio, TX**PS-8A-7-124** Effect of the Assembling Processes on the Formation of Lipid-protein ComplexesW. HUANG¹, AND C. ZHANG¹¹Virginia Tech, Blacksburg, VA**PS-8A-7-125** Dual Functional Thin Film Coating: Microbidal With Controlled Release of A Therapeutic AgentS. Y. WONG¹, J. S. MOSKOWITZ¹, R. C. SMITH¹, J. VESELINOVIC¹, R. A. ROSARIO¹, K. TIMACHOVA¹, M. R. BLAISE¹, A. M. KLIVANOV¹, AND P. T. HAMMOND¹¹Massachusetts Institute of Technology, Cambridge, MA**PS-8A-7-126** Nano-micro Carrier Systems for Sustained Pulmonary Drug DeliveryI. M. EL-SHERBINY¹, AND H. D. SMYTH²¹University of Texas, Austin, TX, ²University of Texas at Austin, Austin, TX**PS-8A-7-127** The Effect of Hydrophobic Chain Length on the Toxicity of Block Copolyptide VesiclesU-J. CHOE¹, A. R. RODRIGUEZ¹, J-K. Y. TAN¹, W. LOU¹, T. J. DEMING¹, AND D. T. KAMEI¹¹UCLA, Los Angeles, CA**PS-8A-7-128** Dexamethasone Modified Self Assembled Monolayers on Smooth and Rough CoCr: An *In Vitro* Study for Drug DeliveryW. FAN¹, G. MANI¹, J. LUO², D. MARTON^{1,2}, E. A. SPRAGUE^{1,2}, M. D. FELDMAN^{1,2}, AND M. AGRAWAL¹¹University of Texas at San Antonio, San Antonio, TX, ²University of Texas Health Science Center at San Antonio, San Antonio, TX**PS-8A-7-129** Boronic Acid Based Microparticulate Insulin Delivery SystemI. DASGUPTA¹, M. SRIVASTAVA¹, E. TANIFUM¹, AND A. ANNAPRAGADA¹¹The 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. BLANCO¹, J. O. MARTINEZ¹, T. SANGAI², F. MERIC-BERNSTAM², AND M. FERRARI¹¹University of Texas Health Science Center at Houston, Houston, TX, ²University of Texas MD Anderson Cancer Center, Houston, TX**PS-8A-7-131** Nanoporous Silicon Particles With Tailored Features for Controlled BiodegradationJ. O. MARTINEZ¹, C. CHIAPPINI², X. LIU¹, M. FERRARI^{1,3}, AND E. TASCIOTTI¹¹The University of Texas Health Science Center, Houston, TX, ²The University of Texas - Austin, Austin, TX, ³The University of Texas MD Anderson Cancer Center, Houston, TX**PS-8A-7-132** Development and Characterization of Fast-acting Microspheres for Thrombolytic TherapyH. X. NGUYEN¹, AND E. A. O'REAR¹¹University of Oklahoma, Norman, OK**PS-8A-7-133** Pertussis Toxin Stability within a Nanofibrous Whooping Cough Vaccine PatchA. SHTEYMAN¹, K. SAWICKA², AND S. SIMON²¹Stony Brook University, Brooklyn, NY, ²Stony Brook University, Stony Brook, NY**PS-8A-7-134** Calcium Carbonate Coprecipitation for Ibl Nanocapsule Drug Delivery SystemM-M. KELLEY¹, S. M. SHIELS¹, AND M. R. APPLEFORD¹¹University 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. POON¹, AND P. T. HAMMOND¹¹MIT, 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. FREEDMAN¹, P. S. SPUHLER¹, E. CEVIK¹, M. SAHIN², AND M. S. UNLU¹¹Boston University, Boston, MA, ²New Jersey Institute of Technology, Newark, NJ**PS-8A-8-137** A 64-Site Three-Dimensional Folded Electrode Array Using Planar FabricationSR. M-E. MERRIAM¹, O. SRIVANNAVIT¹, AND K. D. WISE¹¹University of Michigan, Ann Arbor, MI**PS-8A-8-138** A Biodegradable Regenerative Peripheral Neural InterfaceD. LEWITUS¹, J. R. VOGELSTEIN², Z. GEHUA³, C. YOUNGSEOK³, J. KOHN¹, S. HARSHBARGER², AND X. JIA³¹Rutgers University, Piscataway, NJ, ²The Johns Hopkins University Applied Physics Laboratory, Laurel, MD, ³Johns Hopkins University School of Medicine, Baltimore, MD**PS-8A-8-139** Wavelength Selective Floating Light Activated Micro-Electrical Neurostimulators (FLAMES)E. CEVIK¹, D. S. FREEDMAN¹, P. S. SPUHLER¹, M. SAHIN², AND M. S. UNLU¹¹Boston University, Boston, MA, ²New Jersey Institute of Technology, Newark, NJ**PS-8A-8-140** EMG-Based Neural Network Control of Prosthetic LimbsC. PULLIAM¹, AND R. KIRSCH¹¹Case Western Reserve University, Cleveland, OH**PS-8A-8-141** Development of an Osseo-Magnetic Link for Intuitive Rotational Control of Upper Limb ProsthesesE. J. ROUSE¹, D. C. NAHLIK¹, M. A. PESHKIN², AND T. A. KUIKEN^{1,3}¹Northwestern University, Chicago, IL, ²Northwestern University, Evanston, IL, ³Rehabilitation Institute of Chicago, Chicago, IL

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

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

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

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

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

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

V. BHATKAR¹
¹Clarkson University, Potsdam, NY

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

R. B. PILKAR¹, E. M. BOLLT¹, AND C. J. ROBINSON^{1,2}
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PS-8A-9-149 Dimensionality Reduction in Primate Motor Cortex During Dexterous Grasps

V. AGGARWAL¹, M. MOLLAZADEH¹, A. DAVIDSON², A. CHENG¹, M. H. SCHIEBER², AND N. THAKOR¹
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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. MERRIAM¹, J. SKOUSEN², O. SRIVANNAVIT¹, P. A. TRESKO², AND K. D. WISE¹
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PS-8A-10-151 Real-Time Imaging of Intracortical Inflammation at the Device-Tissue Interface

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¹Case Western Reserve University, Cleveland, OH, ²Cleveland Veteran Affairs Medical Center, Cleveland, OH, ³National Foundation for Cancer Research, Cleveland, OH

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

D. LEWITUS¹, K. SMITH², W. SHAIN², AND J. KOHN¹
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PS-8A-10-153 CNT-Modified Electrode Sites for *In Vitro* and *In Vivo* Silicon Probe Studies

SR. M-E. MERRIAM¹, O. SRIVANNAVIT¹, M. J. ROBERTS¹, Y. ZHANG¹, N. K. DHINGRA¹, A. J. HART¹, AND K. D. WISE¹
¹University of Michigan, Ann Arbor, MI

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

M. L. KUYKENDAL¹, G. S. GUVANASEN¹, M. A. GROVER¹, S. M. POTTER¹, AND S. P. DEWEERTH¹
¹Georgia Institute of Technology, Atlanta, GA

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

B. MORRISON¹, AND B. S. ELKIN¹
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PS-8A-10-156 Assessment of Tissue Response in Push Pull Perfusion for Neurochemical/Electrophysiological Sensing

D. E. CEPEDA¹, L. H. HAINS², K. L. SMITH², W. SHAIN², AND R. T. KENNEDY¹
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PS-8A-10-157 Macrostimulation through the Microelectrode Guide Cannula During DBS Implantation

J. RAKKAR¹, K. MEWES², C. D. ESPER², M. R. DELONG², AND R. E. GROSS²
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PS-8A-10-158 Characterization of Tissue at Intracortical Microelectrode Interfaces Using *In Vitro*, *In Situ* and *In Vivo* Imaging Strategies.

A. J. WOOLLEY¹, H. DESAI¹, M. A. STECKBECK¹, N. ONUNKWO¹, N. PATEL¹, S. SOMMAKIA¹, AND K. J. OTTO¹
¹Purdue 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. PACHECO¹, N. O. ENEMCHUKWU¹, T. A. SULCHEK¹, D. WHITE², AND A. J. GARCIA¹
¹Georgia Institute of Technology, Atlanta, GA, ²Centers for Disease Control and Prevention, Atlanta, GA

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

K. PHUA¹, C. GRIGSBY¹, AND K. LEONG¹
¹Duke University, Durham, NC

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

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¹The Ohio State University, Columbus, OH

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

S. C. LEE¹
¹The Ohio State University, Columbus, OH

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

T. R. FADEL¹, M. LOOK², G. HALLER², L. PFEFFERLE², AND T. FAHMY²
¹Yale Univ, New Haven, CT, ²Yale University, New Haven, CT

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

A. P. ACHARYA¹, N. DOLGOVA¹, J. S. LEWIS¹, T. ZAVERI¹, M. R. CARSTENS¹, C-Q. XIA², M. J. CLARE-SALZLER², AND B. G. KESELOWKSY¹
¹Pruitt Family Department of Biomedical Engineering, University of Florida, Gainesville, FL, ²Department of Pathology, University of Florida, Gainesville, FL

PS-8A-11-165 Design of Potent Complement Inhibitors of the Compstatin FamilyD. MORIKIS¹, A. LOPEZ DE VICTORIA¹, R. GORHAM¹, M. L. BELLOWS², P. TAMAMIS³, G. ARCHONTIS³, D. D. LO¹, AND C. A. FLOUDAS²¹University of California, Riverside, Riverside, CA, ²Princeton University, Princeton, NJ, ³University of Cyprus, Nicosia, Cyprus**PS-8A-11-166** Control of Inflammation Using Spatially Immobilized CytokinesS. Y. KWAN¹, S. K. ANDREKO¹, L. L. SCHULTZ¹, L. E. WEISS¹, B. T. BALLOU¹, X. X. ZHENG², AND P. G. CAMPBELL¹¹Carnegie Mellon University, Pittsburgh, PA, ²University of Pittsburgh Medical Center, Pittsburgh, PA**PS-8A-11-167** Targeted, Immuno-suppressive Microparticles Modify Dendritic Cell Behavior and Induce Foxp3+ Tregs.J. LEWIS¹, N. DOLGOVA¹, C. XIA¹, M. CLARE-SALZLER¹, AND B. KESELOWSKY¹¹University of Florida, Gainesville, FL**PS-8A-11-168** Relationship Between Antigen Binding Affinity and Neutralization Potency of Antibodies Against SARS-COV StrainsM. RANI¹, R. BARIC², B. IVERSON¹, AND G. GEORGIU¹¹UT Austin, Austin, TX, ²UNC, Chapel hill, NC**PS-8A-11-169** Distinct Mechanics of Neutrophil Phagocytosis of Fungal Particles and Antibody-coated TargetsC-Y. LEE¹, M. HERANT², S. M. JOHNSON¹, D. PAPPAGIANIS¹, AND V. HEINRICH¹¹University of California, Davis, CA, ²Boston University, Boston, MA**PS-8A-11-170** Inducing Immune Tolerance Using a Material to Program Dendritic CellsC. VERBEKE¹, AND D. MOONEY^{1,2}¹Harvard University, Cambridge, MA, ²Wyss 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. PASLUOSTA¹, AND A. W. CHIU¹¹Louisiana Tech University, Ruston, LA**PS-8A-12-172** Closed Loop Non-Invasive Human-Robot Interaction: Temperature Sensitive Bionic FingerB. TEPLITZKY¹, V. J. SANTOS¹, AND S. HELMS TILLERY¹¹Arizona State University, Tempe, AZ**PS-8A-12-173** Quantification of Maximum Neck Range of Motion in Assessment of Patient Peripheral VisionB. L. ROACH¹, J. MCKEE¹, R. R. GOODENOUGH¹, J. O. BROOKS¹, AND J. D. DESJARDINS¹¹Clemson University, Clemson, SC**PS-8A-12-174** The Design and Evaluation of a Three-Variable Vibrotactile Feedback System for a Myoelectric ArmE. D. SELLERS¹, AND A. W. CHIU¹¹Louisiana Tech University, Ruston, LA**PS-8A-12-175** The Effects of Noise and Inertia Distribution During a Planar Reaching TaskH. P. NGUYEN¹, AND J. DINGWELL¹¹University of Texas - Austin, Austin, TX**PS-8A-12-176** A Dynamic Walking Model Predicts how Neuromuscular Noise Affects Movement Variability and Fall RiskJ. B. DINGWELL¹, AND P. E. ROOS²¹University of Texas, Austin, TX, ²University of Texas, Austin, TX**PS-8A-12-177** The Design of Cost Efficient Prosthetic Gripper Spring Powered Rotary (SPR) ProstheticsK. SEYEDMADANI¹, V. B. PIZZICONI², J. MUTHUSWAMY², AND S. I. HELMS TILLERY²¹Arizona State University, Paradise Valley, AZ, ²Arizona State University, Tempe, AZ**PS-8A-12-178** Analysis of Amputee Gait Using Virtual Reality Rehabilitation TechniquesM. S. DANGELO¹, S. KOTOWSKI², D. REYNOLDS¹, AND S. NARAYANAN¹¹Wright State University, Dayton, OH, ²University 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. SNIVELY¹, J. COTTON¹, M. GILBERT², AND R. SISSONS³¹Ohio University, Athens, OH, ²University of Saskatchewan, Saskatoon, SK, Canada, ³University of Alberta, Edmonton, AB, Canada**PS-8A-13-180** Dynamic Properties of Soft Tissues in Human Ear at Auditory FrequenciesX. ZHANG¹, D. NAKMALI¹, AND R. Z. GAN¹¹University of Oklahoma, Norman, OK**PS-8A-13-181** High-Speed 3D Motion Analysis System for Quantifying Human Subject Kinematics During Frontal Sled TestsS. BEEMAN¹, A. KEMPER¹, M. MADIGAN², AND S. DUMA¹¹Virginia Tech - Wake Forest, Blacksburg, VA, ²Virginia Tech, Blacksburg, VA**PS-8A-13-182** An Objective Assessment Device For Quantifying Ankle Plantarflexion Muscle Performance During DialysisR. SOANGRA¹, AND T. E. LOCKHART¹¹Virginia Tech, Blacksburg, VA**PS-8A-13-183** The Influence of Screw Thread and Tapping on the Fatigue Performance of Pedicle ScrewsA. VALDEVIT¹, S. LEWIS², J. TURNER³, AND A. RITTER¹¹The Stevens Institute of Technology, Hoboken, NJ, ²UHN Orthopaedics, Toronto, Ontario, Canada, ³Medtronic Spinal and Biologics Business, Memphis, TN**PS-8A-13-184** Rib Fracture Timing in Dynamic Belt Tests with Human CadaversA. R. KEMPER¹, J. D. STITZEL¹, C. MCNALLY¹, E. A. KENNEDY¹, AND S. M. DUMA¹¹Virginia Tech - Wake Forest University, Center for Injury Biomechanics, Blacksburg, VA**PS-8A-13-185** Dynamic Tensile Material Properties of Human Pelvic Cortical BoneA. R. KEMPER¹, C. MCNALLY¹, AND S. DUMA¹¹Virginia 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. QIN¹, M. HU¹, F. SERRA-HSU¹, S. FERRERI¹, J. CHENG¹, Z. ZHANG¹, Y. HUANG¹, AND D. EVANGELISTA¹¹Stony Brook University, Stony Brook, NY**PS-8A-13-187** Relationships between Linear and Angular Head Acceleration from Impact to Human VolunteersS. ROWSON¹, AND S. M. DUMA¹¹Virginia Tech, Blacksburg, VA**PS-8A-13-188** Head Accelerations from Baseballs Impacting Catcher's Masks and Implication on InjuryS. ROWSON¹, K. SHAIN¹, M. MADIGAN¹, AND S. M. DUMA¹¹Virginia Tech, Blacksburg, VA**PS-8A-13-189** Variances in the Blast-Induced Intracranial Pressure Response Due to Subject OrientationB. A. MATHIE¹, AND P. J. VANDEVORD^{1,2}¹Wayne State University, Detroit, MI, ²John 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. HEYDARIAN¹, S. CHOY¹, A. WHEATLEY¹, R. ETEMAD-REZA², D. G. MCCORMACK², AND G. PARRAGA^{1,2}¹Robarts Research Institute, London, ON, Canada, ²University of Western Ontario, London, ON, Canada**PS-8A-14-191** Development of a Pulmonary Surrogate for Blunt to Blast Loading Applications.K. A. DANELSON¹, F. S. GAYZIK¹, J. J. HOTH², AND J. D. STITZEL¹¹Virginia Tech/Wake Forest University SBES, Winston-Salem, NC, ²Wake 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. FULD¹, S. MOBBERLEY¹, J. MORGAN¹, J. SIEREN¹, M. HUDSON¹, AND E. HOFFMAN¹¹University 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. WIECHERT¹, AND W. WALL¹¹Technische Universität München, Garching bei München, Bavaria, Germany**PS-8A-15-194** A Study of Artefacts and Their Removal During Forced OscillationS. A. BHATAWADEKAR¹, Y. CHEN¹, J. OHISHI², P. HERNANDEZ¹, T. BROWN¹, C. MCPARLAND¹, AND G. N. MAKSYM¹¹Dalhousie University, Halifax, Nova Scotia, Canada, ²Tohoku University, Sendai, Miyagi, Japan**PS-8A-15-195** Model-Based Prediction of Exacerbations in AsthmaA. MAJUMDAR¹, AND B. SUKI¹¹Boston University, Boston, MA**PS-8A-15-196** Assessment of Metabolic Variation In Sleep ApneaA. BASHABOYINA¹, D. E. WATENPAUGH², R. ZHANG³, G. BHAVE¹, M. AL-ABED¹, S. IYER¹, E. ALTUWAJRI¹, AND K. . BEHBEHANI¹¹The University of Texas, Arlington, TX, ²Sleep Consultants Inc., Ft. Worth, TX, ³Presbyterian 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. ARNDT¹, K. T. SEALE¹, AND C. C. MARASCO¹¹Vanderbilt University, Nashville, TN**PS-8A-16-198** Calculations of Thermodynamic Effects of Conformational Constraints in Protein-Ligand InteractionsY. SHI¹, AND P. REN¹¹The University of Texas at Austin, Austin, TX**PS-8A-16-199** Protein-ligand Binding Free Energy Calculation with the AMOEBA Polarizable Force FieldJ. ZHANG¹, AND P. REN¹¹The University of Texas at Austin, Austin, TX**PS-8A-16-200** Selective Binding of Peptides on Conducting PolymersJ. FONNER¹, C. E. SCHMIDT¹, AND P. REN¹¹The University of Texas at Austin, Austin, TX**PS-8A-16-201** Steered Molecular Dynamics Parameters to Study Shear Between Collagen MoleculesA. L. KWANSA¹, AND J. W. FREEMAN¹¹Virginia 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. DOLLY¹, AND D. J. KLINKE¹¹West Virginia University, Morgantown, WV**PS-8A-16-203** Release of Nitric Oxide From Hemoglobin Solution Due to Reaction With Nitrite – A Quantitative AnalysisV. MUTHUJAYAN¹, B. PIKNOVA², R. N. PITTMAN³, A. N. SCHECHTER², AND A. S. POPEL¹¹Johns Hopkins University, Baltimore, MD, ²National Institutes of Health, Bethesda, MD, ³Virginia Commonwealth University, Richmond, VA**PS-8A-16-204** Shape-Based Virtual Screening: The Discovery of a Potent Inhibitor Targeting JNK1-J1P1 InteractionC. YAN¹, K. N. DALBY¹, AND P. REN¹¹the 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. MCBRIDE¹, AND V. G. J. RODGERS¹¹University of California, Riverside, CA**PS-8A-16-206** Modeling of the Effects of Protein Alignment & Orientation on Actin Myosin InteractionC-C. LIU¹, S. M. KREUZER¹, E. A. KHATIBLOU¹, J. D. MARQUEZ¹, J. ZHOU¹, AND T. J. MOON^{1,2}¹The University of Texas at Austin, Austin, TX, ²Texas Materials Institute, Austin, TX**PS-8A-16-207** Understanding Protein Preservation in Sugar Glasses via Simulation Study of Fast DynamicsD. S. SIMMONS¹, M. T. CICERONE¹, AND J. F. DOUGLAS¹¹National Institute of Standards and Technology, Gaithersburg, MD**PS-8A-16-208** Modeling of Sustained Protein Release from an Aptamer-Functionalized HydrogelB. SOONTORNWORAJIT¹, M. KARZAR-JEDDI¹, Y. WANG¹, AND T-H. FAN¹¹University of Connecticut, Storrs, CT**PS-8A-16-209** A Coarse-Grained Model for RNA Molecular Dynamics SimulationZ. XIA¹, AND P. REN¹¹The University of Texas at Austin, Austin, TX**PS-8A-16-210** Using Simulation to Study the Effect of Microtubule Dynamics Parameters CategorizationK. Y. KONG¹, R. MOFFITT¹, H. KHAN¹, A. I. MARCUS², AND M. D. WANG¹¹Georgia Institute of Technology, Atlanta, GA, ²Emory University, Atlanta, GA**PS-8A-16-211** Discrete and Stochastic Spatiotemporal Models of Reaction-Diffusion using Agent Based ModelingM. AZIMI¹, Y. JAMALI¹, AND M. MOFRAD¹¹UC Berkeley, Berkeley, CA

PS-8A-16-212 Discrimination of Collagen Denaturation Models Using Parameter EstimationN. T. WRIGHT¹¹Michigan State University, East Lansing, MI**PS-8A-16-213** Continuum Modeling of Myosin II Subfragment-2 Coiled-coilJ. ZHOU¹, S. M. KREUZER¹, E. KHATIBLOU¹, C-C. LIU¹, J. D. MARQUEZ¹, AND T. J. MOON¹¹University of Texas at Austin, Austin, TX**PS-8A-16-214** Comparative Study of Reranking Methods for Fast Fourier Transform-Based Protein-Protein Docking ProgramsM. MOUSSALEM¹, R. CHOWDHURY¹, D. KEIDEL², A. OLSON², M. SANNER², AND C. BAJAJ¹¹The University of Texas at Austin, Austin, TX, ²The Scripps Research Institute, La Jolla, CA**PS-8A-16-215** Scalable Integration of Multiple Molecular Pathway ModelsV. AYYADURAI¹, AND C. F. DEWEY¹¹M.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. MARQUEZ¹, S. KREUZER¹, E. KHATIBLOU¹, D. LIU¹, J. ZHOU¹, AND T. MOON^{1,2}¹The University of Texas at Austin, Austin, TX, ²Texas Materials Institute, Austin, TX**PS-8A-16-217** Integrative Model of Interferon (IFN) Response to Viral InfectionS. AYYADURAI¹¹M.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. NAGAO¹, AND C. E. SCHMIDT¹¹University of Texas at Austin, Austin, TX**PS-8A-17-219** Independent Tuning of Enzymatically Cleavable starPEG-heparin Hydrogels to Direct Tissue RegenerationK. R. LEVENTAL¹, M. S. GRIEB¹, M. V. TSURKAN¹, K. CHWALEK¹, U. FREUDENBERG¹, AND C. WERNER¹¹Leibniz Institute of Polymer Research Dresden, Dresden, Germany**PS-8A-17-220** Investigation of Biomimetic Folding within PolydepsipeptidesM. M. NGUYEN¹, J. ZHANG¹, P. REN¹, AND L. SUGGS¹¹University of Texas at Austin, Austin, TX**PS-8A-17-221** Sequential Immobilization of TM and EPCR to create a Biomimetic Vascular SurfaceM. SCHNEIDER¹, A. SUBRAMANIAN¹, K. KADOR¹, AND T. MAMMEDOV¹¹University of Nebraska, Lincoln, NE**PS-8A-17-222** The Insect Tracheal System As a Microfluidic Pump:A Test Of The Hemolymph Pressure HypothesisL. M. COX¹, AND J. J. SOCHA²¹Virginia Tech, Blacksburg, VA, ²Virginia Tech, Blacksburg, VA**PS-8A-17-223** Selectable, Tunable Naturally Occurring Nano-materials for Tissue EngineeringL. XIA¹, S. LENAGHAN¹, A. WILLS¹, AND M. ZHANG¹¹University of Tennessee, Knoxville, TN**PS-8A-17-224** What Makes a Nerve Guidance Feature?-Novel Materials Inspired by Schwann CellsC. Y. LOPEZ-FAGUNDO¹, AND D. HOFFMAN-KIM, PH.D.¹¹Brown University, Providence, RI**PS-8A-17-225** Biomimetic Surface Functionalized Poly(Lactic Acid) Fibers for Musculoskeletal Tissue RegenerationJ. D. MURRAY¹, S. B. VANGORDON¹, T. B. BLUE¹, R. L. SHAMBAUGH¹, P. L. DEANGELIS², AND V. I. SIKAVITSAS¹¹University of Oklahoma, Norman, OK, ²University 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. CHOH¹, AND C. WANG¹¹University 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. NORIEGA¹, S. GUHA THAKURTA¹, M. SCHNEIDER¹, G. BUDDIRAJA¹, AND A. SUBRAMANIAN¹¹University of Nebraska, Lincoln, NE**PS-8A-18-228** CANCELED**PS-8A-18-229** Bioreactor Expansion and Differentiation of Adult Side Population Stem CellsD. B. COWAN¹, I. V. ALPATOV¹, AND K-R. WANG¹¹Children's Hospital Boston and Harvard Medical School, Boston, MA**PS-8A-18-230** A Novel Mechano-Active Biaxial Stretcher for Engineering Planar TissuesJ-J. HU¹, AND Y-C. LIU²¹Institute of Biomedical Engineering, National Cheng Kung University, Tainan, Taiwan, ²Department of Mechanical Engineering, National Chiao Tung University, Hsinchu, Taiwan, Taiwan**PS-8A-18-231** Measuring Glucose Consumption by Chondrogenically Differentiating Mesenchymal Stem CellsK. J. PENICK¹, H. BASKARAN¹, J. A. BERILLA¹, AND J. F. WELTER¹¹Case Western Reserve University, Cleveland, OH**PS-8A-18-232** A Bioreactor to Mechanically Stimulate and Evaluate Tissue-engineered Constructs During CultureT. J. LUJAN¹, K. WIRTZ¹, S. MADEY¹, AND M. BOTTLANG¹¹Legacy Research, Portland, OR**PS-8A-18-233** Influence of Scaffold Structure and Flow Perfusion Shear Stress on MSC Osteoblastic DifferentiationS. B. VANGORDON¹, R. S. VORONOV¹, T. B. BLUE¹, R. L. SHAMBAUGH¹, D. V. PAPAVALASSILOU¹, AND V. I. SIKAVITSAS¹¹University of Oklahoma, Norman, OK**PS-8A-18-234** High-Throughput Antibody-Independent Method For Sorting Stem CellsK. M. LYNCH¹, AND T. AHSAN¹¹Tulane 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. AZARIN¹, J. ZHANG¹, C. HSIAO¹, X. LIAN¹, T. J. KAMP¹, AND S. P. PALECEK¹¹University of Wisconsin - Madison, Madison, WI**PS-8A-19-237** Long-Term Quantitative In Vivo Characterization of Alginate Microcapsules in Balb/c MiceC. YONG¹, A. LAWSON¹, AND A. SAMBANIS¹¹Georgia Institute of Technology, Atlanta, GA**PS-8A-19-238** Tissue Engineered 3-Dimensional Bone Autografts Using the Wharton's JellyR. I. ABOUSLEIMAN^{1,2}, AND V. SIKAVITSAS²¹Oklahoma Medical Research Foundation, Oklahoma City, OK, ²University of Oklahoma, Norman, OK**PS-8A-19-239** Sonic Hedgehog Presentation on Dynabeads Directs Mesodermal Commitment of Mouse Embryonic Stem CellsL. GEUSS¹, G. ZHANG², AND L. J. SUGGS¹¹The University of Texas at Austin, Austin, TX, ²The University of Akron, Akron, OH**PS-8A-19-240** Reprogramming of Gastric Cancer Line MKN-28C. X. CAI¹, A. Q. LU¹, AND J.-C. LIAO¹¹Columbia University, New York, NY**PS-8A-19-241** Dynamic Tracking of Induced Pluripotent Stem Cell Reprogramming ProcessP. J. HAMPILOS¹, C. X. CAI¹, AND J.-C. LIAO¹¹Columbia University, New York, NY**PS-8A-19-242** Unique Technique for Growing Progenitor Epithelial Keratinocyte StrainsA. PERAMO¹, AND C. MARCELO¹¹University 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. ALMODOVAR¹, S. BACON¹, J. GOGOLSKI¹, J. KISIDAY¹, AND M. KIPPER¹¹Colorado State University, Fort Collins, CO**PS-8A-19-244** Optimization of Intermediate Steps of the Beta-Islet Differentiation Program for Human Embryonic Stem CellsM. JARAMILLO¹, AND I. BANERJEE¹¹University of Pittsburgh, Pittsburgh, PA**PS-8A-19-245** Microstructures and Growth Factors Alter Stem Cell Proliferation and Migration for Regenerative TherapyJ. M. COLLINS¹, P. AYALA², T. A. DESAI², P. H. GOLDSPIK¹, AND B. RUSSELL¹¹University of Illinois at Chicago, Chicago, IL, ²University 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. FRANCO¹, N. GORENKOVA², Z. HASSANI², G. EL AKABAWY², R. POCHÉ³, M. MODO², M. DICKINSON³, AND J. WEST¹¹Rice University, Houston, TX, ²King's College, London, United Kingdom, ³Baylor College of Medicine, Houston, TX**PS-8A-19-247** Biomaterial Implant Recruits and Differentiates Autologous Stem CellsA. M. NAIR^{1,2}, J. SHEN^{1,2}, M.-W. SUN^{1,2}, C. ZHANG², AND L. TANG^{1,2}¹The University of Texas at Arlington, Arlington, TX, ²The 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. DESAI¹, N. KULKARNI¹, D. VERMA¹, M. L. PREVITERA¹, R. SCHLOSS¹, AND N. LANGRANA¹¹Rutgers University, Piscataway, NJ**PS-8A-19-249** Spontaneous Fusion of Mesenchymal Stem Cells with Endothelial CellsQ. A. TRAN¹, AND B. OGLE¹¹University 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. TONG¹, S. SANT^{2,3}, A. KHADEMHOSEINI^{2,3}, AND X. JIA¹¹Delaware Biotechnology Institute, University of Delaware, Newark, DE, ²Harvard/MIT Division of Health Sciences and Technology, Massachusetts Institute of Technology, Cambridge, MA, ³Brigham 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. WOLFE¹, J. LELEUX¹, AND T. AHSAN¹¹Tulane University, New Orleans, LA**PS-8A-19-252** Outcomes of Pre-differentiated Mesenchymal Stem Cell-seeded Hydrogel Implants in Cartilage LesionsR. M. SCHULZ^{1,2}, J. S. SOMERSON^{1,3}, M. ZSCHARNACK^{1,2}, P. HEPP⁴, R. RICHTER⁴, C. JOSTEN⁴, A. BADER², AND B. MARQUASS^{1,4}¹University of Leipzig Translational Centre for Regenerative Medicine, Leipzig, Germany,²University of Leipzig Center of Biotechnology and Biomedicine, Leipzig, Germany,³University of Texas Health Science Center San Antonio, San Antonio, TX, ⁴University 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. RAO¹¹Virginia Commonwealth University, Richmond, VA**PS-8A-19-254** An Implantable Immuno-Modulatory Bioreactor for Spinal Cord Injury RepairJ. BARMINKO¹, J. H. KIM¹, S. OTSUKA¹, R. SCHLOSS¹, M. GRUMET¹, AND M. L. YARMUSH¹¹Rutgers University, Piscataway, NJ**PS-8A-19-255** A Small-scale Assay for Optimizing Differentiation Protocols of Human Embryonic Stem CellsJ. T. OUTTEN¹, X. CHENG², P. GADUE², D. L. FRENCH², AND S. L. DIAMOND¹¹University of Pennsylvania, Philadelphia, PA, ²Children'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 FORTIN¹, AND T. AHSAN¹¹Tulane University, New Orleans, LA**PS-8A-19-257** Engineering the Pericellular Matrix: Silencing Type VI Collagen and Decorin in Differentiating hMSCsJ. D. TWOMEY¹, P. I. THAKORE¹, AND A. H. HSIEH^{1,2}¹University of Maryland, College Park, MD, ²University of Maryland, Baltimore, MD**PS-8A-19-258** Donor-age Dependent Changes in Mesenchymal Stem Cell FunctionsC. BUCKSPAN¹, AND S. VARGHESE¹¹Uc San Diego, La Jolla, CA**PS-8A-19-259** Combinatorial Effects of Matrix Elasticity and Cell Shape on Mesenchymal Stem Cell DifferentiationB. J. GILL^{1,2}, S. NEMIR^{1,2}, AND J. L. WEST¹¹Rice University, Houston, TX, ²Baylor College of Medicine, Houston, TX**PS-8A-19-260** Biomaterial Systems to Assess the Influence of Cell-matrix Interactions on Hematopoietic Stem CellsJ. CHOI¹, AND B. HARLEY¹¹University 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. RIVERA¹, R. T. LI², J. F. WELTER¹, AND H. BASKARAN¹¹Case Western Reserve University, Cleveland, OH, ²University of Pittsburgh School of Medicine, Pittsburgh, PA**PS-8A-19-262** In Vivo Tracking of Nanoparticle Labeled Mesenchymal Stem Cells Using Photoacoustic ImagingL. M. RICLES¹, S. NAM¹, K. SOKOLOV^{1,2}, S. EMELIANOV¹, AND L. J. SUGGS¹¹University of Texas at Austin, Austin, TX, ²University 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. KIM¹, J. GRANICK¹, C. KWOK¹, D. BORJESSON¹, F-R. CURRY¹, L. MILLER², AND S. SIMON¹¹UC Davis, Davis, CA, ²UCLA, Los Angeles, CA**PS-8A-19-264** Impact of Extracellular Matrix Composition on Cardiomyogenic Differentiation of hESCsA. LAPERLE¹, S. PALECEK¹, AND K. MASTERS¹¹University of Wisconsin-Madison, Madison, WI**PS-8A-19-265** Connexon-mediated Cell Adhesion Drives Microtissue Self-AssemblyB. A. BAO¹, AND J. MORGAN¹¹Brown 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. TIAN¹¹University of California, Irvine, Irvine, CA**PS-8A-19-267** Effect of Patterned TNF- Delivery On In Vitro Osteogenic Differentiation of Mesenchymal Stem CellsP. M. MOUNTZIARIS¹, E. D. LEHMAN¹, F. K. KASPER¹, AND A. G. MIKOS¹¹Rice University, Houston, TX**PS-8A-19-268** Biomaterial Systems to Assess Cell-cell Interactions on Hematopoietic Progenitor CellsB. MAHADIK¹, J. LIN¹, G. TIMP¹, M. SVAGURU¹, AND B. HARLEY¹¹University of Illinois at Urbana Champaign, Urbana, IL**PS-8A-19-269** Biomechanical Control of Stem Cell Behavior and FateI. TITUSHKIN¹, J. SHIN², AND M. CHO¹¹University of Illinois, Chicago, IL, ²Korea 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. SCHILLER¹, AND C. K. KUO¹¹Tufts University, Medford, MA**PS-8A-19-271** Three-Dimensional Differentiation of Human Embryonic Stem Cells into Definitive EndodermW. WANG¹, Y. ZHU¹, S. JIN¹, AND K. YE¹¹University of Arkansas, Fayetteville, AR**PS-8A-19-272** The Effects of Microenvironment on the Growth and Differentiation of Human Pulpal-derived Stem CellsL. DATKO¹, M. CUPELLI¹, S. ALAPATI², AND D. DEAN¹¹Clemson University, Clemson, SC, ²University of Illinois at Chicago, Chicago, IL**PS-8A-19-273** Applying Multiple, Independent Chemical Gradients to Human Stem Cells In 3D Culture EnvironmentsS. SANDOCK¹, J. WHITE², AND T. M. KEENAN¹¹University of Wisconsin, Madison, WI, ²University of Michigan, Ann Arbor, MI**PS-8A-19-274** Cell Secreted Matrices Influence the Differentiation of Adipose Derived Stem CellsH. B. COAN¹, C. BOOTH¹, M. LIVELY¹, AND M. VAN DYKE¹¹Wake 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. HAMMERS¹, M. CANNON¹, B. A. BUNNELL², AND R. P. FARRAR¹¹The University of Texas at Austin, Austin, TX, ²Tulane University Health Sciences Center, New Orleans, LA**PS-8A-19-276** Mapping the Mechanical Milieu of Stem Cells In Situ within Tissue Engineering ScaffoldsM. SONG¹, D. DEAN¹, AND M. L. KNOTHE TATE¹¹Case 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. KIM¹, J. LIN¹, M. MENDOZA¹, AND K. ROY¹¹University of Texas at Austin, Austin, TX**10:45AM OP-8-I-1B** Combinatorial Development of Biomaterials for Stem Cell EngineeringY. MEI¹, K. SAHA², S. R. BOGATYREV¹, J. YANG³, A. L. HOOK³, Z. I. KALCIOGLU¹, S.-W. CHO¹, M. MITALIPOVA², N. PYZOCHA², F. ROJAS¹, K. J. VAN VLIET¹, M. C. DAVIES³, M. R. ALEXANDER³, R. LANGER¹, R. JAENISCH², AND D. ANDERSON¹¹MIT, Cambridge, MA, ²Whitehead Institute for Biomedical Research, Cambridge, MA, ³The University of Nottingham, Nottingham, United Kingdom**11:00AM OP-8-I-1C** Morphological Change of Epithelial Cells Cultured on Substrates with Different StiffnessM. YAMAMOTO¹, Y. MURAKAMI¹, AND Y. TABATA¹¹Institute 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. KNIAZEVA¹, M. DIGMAN¹, E. GRATTON¹, AND A. PUTNAM²¹University of California, Irvine, Irvine, CA, ²University of Michigan, Ann Arbor, MI**11:30AM OP-8-I-1E** Growth Factor Binding is Regulated by Extracellular Matrix Deposition From Human Calvarial OsteoblastsA. BHAT¹¹University of California-Davis, Woodland, CA**11:45AM OP-8-I-1F** Fibronectin Matrix Conformation Defines Regions of Cell Proliferation and Stress Fiber FormationC. SEVILLA¹, D. DALECKI¹, AND D. HOCKING¹¹University 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^{1,2}, E. A. WILDE², Z. CHU^{2,3}, T. C. WU⁴, J. V. HUNTER^{2,3}, A. C. VASQUEZ², E. D. BIGLER⁴, AND H. S. LEVIN²¹Rice University, Houston, TX, ²Baylor College of Medicine, Houston, TX, ³Texas Children's Hospital, Houston, TX, ⁴Brigham Young University, Provo, UT**10:45AM OP-8-I-2B** Microvascular Functional Imaging with FENSI: Flow-Enhanced Signal IntensityC. OUYANG¹, AND B. SUTTON¹¹University 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. TAN¹, W. S. HOGE², AND R. A. KRAFT¹¹Virginia Tech - Wake Forest School of Biomedical Engineering and Sciences, Winston-Salem, NC, ²Brigham 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. CORNELIUS¹, AND P. C. DOERSCHUK¹¹Cornell University, Ithaca, NY**11:30AM OP-8-I-2E** A Random Visual Cortex Mapping Technique for Clinical UseY. MA¹, E. DEYOE², AND K. ROPELLA¹¹Marquette University, Milwaukee, WI, ²Medical 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^{1,2}, D. P. MORENO^{1,2}, C. P. GEER¹, AND J. D. STITZEL^{1,2}¹Wake Forest University School of Medicine, Winston-Salem, NC, ²Virginia 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, Michaelann Tartis

Room 19A

10:30AM OP-8-I-3A Photoacoustic Image-Guided Drug DeliveryK. A. HOMAN¹, J. CHEN¹, L. BRANNON-PEPPAS², AND S. EMELIANOV¹¹University of Texas at Austin, Austin, TX, ²PeppChem Consulting, Austin, TX**10:45AM OP-8-I-3B** Redefining In-Sight: Effective MRI Contrast Agents in Biodegradable Polymeric Drug Delivery VehiclesR. RAGHEB¹, H. CHAHBOUNE¹, J. CRISCIONE¹, AND T. FAHMY¹¹Yale University, New Haven, CT**11:00AM OP-8-I-3C** A Platform for Enhanced Contrast Ultrasound Targeted Delivery of TherapeuticsC. W. BURKE¹, A. L. KILBANOVI¹, J. SHEEHAN¹, AND R. J. PRICE¹¹University of Virginia, Charlottesville, VA**11:15AM OP-8-I-3D** MR-based Pharmacokinetics of the Focused-Ultrasound-induced Blood-Brain Barrier OpeningF. VLACHOS¹, Y.-S. TUNG², AND E. KONOFAGOU²¹Columbia University, New York, NY, ²Columbia University, New York, NY**11:30AM OP-8-I-3E** Electromagnetically Tracked Ultrasound for Combined CT+US Therapy in Small AnimalsC. F. CASKEY¹, M. HLAWITSCHKA¹, S. QIN¹, AND K. W. FERRARA¹¹University of California at Davis, Davis, CA**11:45AM OP-8-I-3F** Real-Time Model Assisted MR Temperature Imaging for Monitoring LITT ProceduresD. FUENTES¹, J. YUNG¹, A. ELLIOTT¹, J. HAZLE¹, AND R. J. STAFFORD¹¹The 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. TYLER¹¹Case Western Reserve University, Cleveland, OH**10:45AM OP-8-I-4B** A Dual Resonance Model of Cochlear TuningD. C. MOUNTAIN¹¹Boston University, Boston, MAPS = Poster Session
OP = Oral Presentation

11:00AM OP-8-1-4C State Dependence of Cortical Optogenetic Perturbations during Active Touch

J. T. RITT¹, J. H. SIEGLE², M. CARLEN³, K. MELETIS³, L-H. TSAI², AND C. I. MOORE²
¹Boston University, Boston, MA, ²Massachusetts Institute of Technology, Boston, MA, ³Karolinska Institutet, Stockholm, Sweden

11:30AM OP-8-1-4D Computational & Evidence Based Methods in Neuromodulation

C. R. BUTSON^{1,2}, B. H. KOPELL¹, S. BAILLET¹, W. GAGGL¹, R. R. RAMIREZ¹, K. DRIESSLEIN¹, AND S. JAIN¹
¹Medical College of Wisconsin, Milwaukee, WI, ²Marquette University, Milwaukee, WI

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

Cellular Engineering and Modeling

Chairs: Alexander Spector, Fan Yang
 Room 18A

10:30AM OP-8-1-5A Self-Organization of a Two Cell Muscle Tissue: Theory and Experiment

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

10:45AM OP-8-1-5B Modulation of Ca²⁺ Homeostasis and Proteostasis for Lysosomal Storage Disease Therapeutics

F. WANG¹, AND L. SEGATORI¹
¹Rice University, Houston, TX

11:00AM OP-8-1-5C Frequency Response Detection and Prediction of First-order Spatiotemporal Dynamics in a Xenopus Embryonic Tissue Using Microfluidics

Y. KIM¹, S. D. JOSHI², L. A. DAVIDSON², W. C. MESSNER¹, AND P. R. LEDUC¹
¹Carnegie Mellon University, Pittsburgh, PA, ²University of Pittsburgh, Pittsburgh, PA

11:15AM OP-8-1-5D Decision Tree Analysis of Microfluidic Angiogenesis Studies: Determining Cell Fate Transition Probabilities to VEGF/Ang1 Levels

A. DAS¹, H. ASADA¹, D. LAUFFENBURGER¹, AND R. KAMM¹
¹MIT, Cambridge, MA

11:30AM OP-8-1-5E Modeling Biological Membranes as Self-assembled Two-Dimensional Particle Fluids

S. ZHANG¹, H. YUAN¹, C. HUANG¹, AND J. LI²
¹Penn State University, University Park, PA, ²Univ. Pennsylvania, Philadelphia, PA

11:45AM OP-8-1-5F The Effects of Nuclear Pre-stress on Passive and Facilitated Nuclear Transport

T. CHANCELLOR¹, AND T. LELE¹
¹University of Florida, Gainesville, FL

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

Cell-Cell Interactions

Chairs: Lance Kam, Todd Sulchek
 Room 18B

10:30AM OP-8-1-6A JNK-mediated Regulation of Adherens Junctions

M. LEE¹, AND S. ANDREADIS¹
¹SUNY Buffalo, Buffalo, NY

10:45AM OP-8-1-6B Mechanotransduction at Cell-Cell Junctions

D. LECKBAND¹, Q. SHI², Q. LE DUC³, J. DE ROOIJ³, AND N. WANG²
¹University of Illinois, Champaign, IL, ²University of Illinois, Urbana, IL, ³Hubrecht Institute, Utrecht, Utrecht, Netherlands

11:00AM OP-8-1-6C Measurement of Adhesion Strengthening in Homophilic Cadherin-Based Cell-Cell Interactions

C. C. ESIMAI¹, R. OAS², A. P. KOWALCZYK², AND A. J. GARCIA¹
¹Georgia Institute of Technology, Atlanta, GA, ²Emory University, Atlanta, GA

11:15AM OP-8-1-6D Multicellular Aggregation Dynamics is Consistent With a Two-step Transport-reaction Model

M. D. POPE¹, AND A. R. ASTHAGIRI¹
¹Caltech, Pasadena, CA

11:30AM OP-8-1-6E Probing the Microrheology of Mesenchymal Stem Cell Migration to Tumors

M. DAWSON¹, D. MCGRAIL¹, AND D. ZUELKE¹
¹Georgia Institute of Technology, Atlanta, GA

11:45AM OP-8-1-6F Substratum Compliance Modulates the Quantitative Interplay Between EGF and Cell-Cell Contact and Affects Contact-inhibition of Proliferation in Epithelial Cell Clusters

J. KIM¹, AND A. ASTHAGIRI² JOHN TARBELL
¹California Institute of Technology, Engineering and Applied Science, Pasadena, CA, ²California Institute of Technology, Division of Chemistry and Chemical Engineering, Pasadena, CA

Track: Cardiovascular Engineering – 8-1-7

Vascular Permeability

Chairs: Kenneth Barbee, John Tarbell
 Room 18C

10:30AM OP-8-1-7A Endothelial Cell Apoptosis Controls Permeability to Low Density Lipoprotein in Arterial Disease

L. M. CANCEL¹, F. PIRAINO², AND J. M. TARBELL¹
¹The City College of New York, New York, NY, ²Politecnico di Milano, Milano, Milano, Italy

10:45AM OP-8-1-7B Transendothelial Transport May Determine Adiponectin Oligomer Functions

J. M. RUTKOWSKI¹, AND P. E. SCHERER¹
¹UT Southwestern Medical Center, Dallas, TX

11:00AM OP-8-1-7C Bioengineered Tools for Quantifying Lymphatic Function in Lipid Transport

J. DIXON¹, J. A. KORNUA¹, AND T. KASSIS¹
¹Georgia Institute of Technology, Atlanta, GA

11:15AM OP-8-1-7D Assessing the Permeability of Engineered Capillary Networks in a 3D Culture

S. J. GRAINGER¹, AND A. J. PUTNAM¹
¹University of Michigan, Ann Arbor, MI

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

C. B. RAVAL¹, J. M. TARBELL², K-M. JAN³, AND D. S. RUMSCHITZKI²
¹Graduate Center at The City University New York, New York, NY, ²The City College of New York, NY, NY, ³Columbia University, New York, NY

11:45AM OP-8-1-7F Cholesterol Enrichment Inhibits Endothelial Capacitative Calcium Entry (CCE)

A. M. ANDREWS¹, AND K. A. BARBEE¹
¹Drexel University, Philadelphia, PA

Track: Cardiovascular Engineering – 8-1-8

Heart Valve I: Mechanobiology and Pathology

Chairs: Richard Goodwin, James Warnock
 Room 18D

10:30AM OP-8-1-8A Raman Spectroscopy Characterization to Compare In Vitro and In Situ Aortic Valve Calcification

K. L. CLOYD¹, I. EL-HAMAMSY¹, P. SARATHCHANDRA¹, E. GENTLEMAN¹, M. H. YACOB¹, A. H. CHESTER¹, AND M. M. STEVENS¹
¹Imperial College London, London, UK, United Kingdom

10:45AM OP-8-1-8B Interaction of Serotonin and TGF β Signaling in Embryonic Atrioventricular Valve RemodelingP. BUSKOHL¹, M. SUN¹, AND J. T. BUTCHER¹¹Cornell University, Ithaca, NY**11:00AM OP-8-1-8C** Elevated Pressure Modulates Osteogenic De-Differentiation of Aortic Valve Interstitial CellsC. A. PREGONERO-GAMEZ¹, A. E. RUHL¹, AND J. N. WARNOCK¹¹Mississippi State University, Mississippi State, MS**11:15AM OP-8-1-8D** Fluid Flow Regulates ECM Protein Expression and Deposition During Cardiac Valve DevelopmentH. TAN¹, S. BIECHLER¹, L. JUNOR¹, M. J. YOST¹, J. D. POTTS¹, AND R. L. GOODWIN¹¹University 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. HUSSAIN¹, C. H. YAP¹, K. BALACHANDRAN², AND A. YOGANATHAN¹¹Georgia Institute of Technology, Atlanta, GA, ²Harvard University, Cambridge, MA**11:45AM OP-8-1-8F** Calcium Accumulation in Strained Aortic Valve Interstitial CellsJ. D. HUTCHESON¹, AND W. D. MERRYMAN¹¹Vanderbilt University, Nashville, TN**Track: Respiratory Engineering – 8-1-9****Microfluidics and Tissue Engineering Constructs for the Lung****Chairs:** Samir Ghadiali, Hossein Tavara

Room 17A

10:30AM OP-8-1-9A A Human Breathing Lung-on-a-ChipD. HUH^{1,2}, B. D. MATTHEWS², A. MAMMOTO², M. MONTOYA-ZAVALA^{1,2}, H. HSIN², AND D. E. INGBER^{1,2}¹Wyss Institute for Biologically Inspired Engineering at Harvard University, Boston, MA, ²Harvard 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. CARPENTER¹, M. MILLARD¹, V. PARIKH¹, E. T. O'BRIEN¹, M. R. FALVO¹, AND R. R. SUPERFINE¹¹UNC 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. DOUVILLE¹, Y-C. TUNG¹, P. ZAMANKHAN¹, J. B. GROTEBERG¹, AND S. TAKAYAMA¹¹University 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. SMITH¹, E. YAMAGUCHI¹, J. W. THIEMAN¹, AND D. P. GAVER III¹¹Tulane 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-CASTRO¹, X. CHEN¹, C. MIHAI¹, D. J. HANSFORD¹, AND S. N. GHADIALI¹¹The 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. LAPRAD¹, B. SUKI¹, AND K. R. LUTCHEN¹¹Boston 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. TELESKO¹, R. VADIGEPALLI², AND R. RADHAKRISHNAN¹¹University of Pennsylvania, Philadelphia, PA, ²Thomas Jefferson University, Philadelphia, PA**10:45AM OP-8-1-10B** Probabilistic Integrative Modeling of Genome-scale Metabolic and Regulatory NetworksS. CHANDRASEKARAN¹, AND N. D. PRICE¹¹Institute 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. THORNE¹, H. HAYENGA², J. HUMPHREY², AND S. M. PEIRCE¹¹University of Virginia, Charlottesville, VA, ²Texas A&M University, College Station, TX**11:15AM OP-8-1-10D** Tumor Targeting Across the Size Spectrum – Common Physiology, Divergent PharmacokineticsG. M. THURBER¹, AND R. WEISSELEDER¹¹Harvard 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. KREUZER¹, E. KHATIBLOU¹, D. LIU¹, J. ZHOU¹, J. MARQUEZ¹, AND T. MOON^{1,2}¹University of Texas at Austin, Austin, TX, ²Texas Materials Institute, Austin, TX**11:45AM OP-8-1-10F** Computational Models of Embryonic Wound HealingM. A. WYCZALKOWSKI¹, AND L. A. TABER¹¹Washington 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. OKABE¹, Y. CHEN¹, R. CORN¹, AND A. LEE¹¹University 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. TASCIOTTI¹, M. AGOSTINI², A. BOUAMRANI¹, T. HU³, D. NITTI⁵, AND M. FERRARI¹¹University of Texas Health Science Center at Houston, Houston, TX, ²Universita' di Padova, Padova, Italy, ³University Of Texas at Austin, Austin, TX, ⁴United States Minor Outlying Islands, ⁵**11:00AM OP-8-1-11C** Aptamer-based Nanoplasmonic VEGF165 Sensor for Breast Cancer DiagnosticsE-C. YEH¹, H. CHO¹, R. SINHA², AND L. P. LEE¹¹University of California, Berkeley, Berkeley, CA, ²Pennsylvania State University, Hershey, PA**11:15AM OP-8-1-11D** Detection of Cancer Related DNA Nanoparticulate Biomarkers in Whole BloodM. J. HELLER¹, AND A. SONNENBERG¹¹University 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. HAUN¹, H. LEE¹, C. M. CASTRO¹, AND R. WEISSELEDER¹¹Massachusetts General Hospital, Boston, MA**11:45AM OP-8-I-11F** Integrated Molecular Diagnostic Systems (iMDs) for Sepsis DiagnosticsD. MITRA¹, S-S. CHEN¹, AND L. P. LEE¹¹University 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. MOORJANI¹, R. NIELSON^{1,2}, X. A. CHANG¹, AND J. B. SHEAR¹¹University of Texas, Austin, TX, ²BD Technologies, Research Triangle Park, NC**10:45AM OP-8-I-12B** Core-Shell Biomimetic Cilia: Driven Flow in Aqueous and Viscoelastic FluidsB. L. FISER¹, A. R. SHIELDS¹, D. BOBER², B. A. EVANS³, AND R. SUPERFINE¹¹University of North Carolina at Chapel Hill, Chapel Hill, NC, ²Swarthmore College, Swarthmore, PA, ³Elon University, Elon, NC**11:00AM OP-8-I-12C** - A Parallelized Microfluidic Chamber Device for High-Throughput Nerve Regeneration Studies in *C. elegans*N. GHORASHIAN¹, M. A. HILLIARD², AND A. BEN-YAKAR¹¹The University of Texas at Austin, Austin, TX, ²The University of Queensland, Brisbane, Queensland, Australia**11:15AM OP-8-I-12D** Open-Chamber Focal Stimulation Device for Biomimetic Study of SynaptogenesisT. CHANG¹, N. BHATTACHARJEE¹, AND A. FOLCH¹¹University of Washington, Seattle, WA**11:30AM OP-8-I-12E** Autonomous Microfluidic Device for Quantification and Regulation of VasopressinA. J. CHUNG¹, I. CHOI¹, B. CORDOVEZ¹, Y. HUH^{1,2}, AND D. ERICKSON¹¹Cornell University, Ithaca, NY, ²Korea 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. KAHSAI¹, U. H. PHAM¹, R. SHAFABAKHSH¹, J. S. SANKARAN¹, AND S. M. IQBAL¹¹University 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. WANAKULE¹, A. BERGERON¹, AND K. ROY¹¹University 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. KHALED¹, S. DIETZ¹, C. A. SMID¹, M. FERRARI¹, AND E. TASCIOTTI¹¹The 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. CABRALES¹¹University of California, San Diego, La Jolla, CA**11:15AM OP-8-I-13D** Novel Biodegradable PGD Polymeric Nanoparticles Preparation and CharacterizationR. MANCHANDA¹, Y-C. HUANG¹, T. LEI¹, A. FERNANDEZ-FERNANDEZ¹, AND A. J. MCGORON¹¹Florida International University, Miami, FL**11:30AM OP-8-I-13E** Controlled Delivery of Programmable Colloidal StructuresM. RAFAT¹, J-O. YOU¹, AND D. T. AUGUSTE¹¹Harvard University, Cambridge, MA**11:45AM OP-8-I-13F** Immunosuppressive Micelles Delivered Locally to Lymph Nodes Prolong Allograft SurvivalK. Y. DANE¹, C. P. O'NEIL¹, C. NEMBRINI¹, A. A. TOMEI¹, D. VELLUTO¹, J. K. EBY¹, M. A. SWARTZ¹, AND J. A. HUBBELL¹¹Ecole 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. YAZDANI¹, F. D. KOLOGDIE¹, AND R. VIRMANI¹¹CVPath Institute, Gaithersburg, MD**10:45AM OP-8-I-14B** Evolutionary Game Theoretical Approach for Controlled Drug Delivery of GiardiasisJ. WU¹, S. LENAGHAN¹, AND M. ZHANG²¹UTK, Knoxville, TN, ²University of Tennessee, Knoxville, TN**11:00AM OP-8-I-14C** Novel Nanoparticle-encapsulated Compound Halts Gliomalinvasion *In Vivo*J. M. MUNSON¹, J. ARBISER², AND R. BELLAMKONDA¹¹Georgia Institute of Technology, Atlanta, GA, ²Emory Medical School, Atlanta, GA**11:15AM OP-8-I-14D** Hyperthermic Drug Delivery Using Metal NanoparticlesN. H. LEVI-POLYACHENKO¹, A. BRADEN¹, AND M. MORYKWAS¹¹Wake 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 MANCHENO¹, D. SHARMA¹, J. H. HEALEY², G. R. DIRESTA³, AND S. P. FRITTON¹¹City College of New York, New York, NY, ²Memorial Sloan-Kettering Cancer Center, New York, NY, ³Polytechnic Institute of NYU, New York, NY**11:45AM OP-8-I-14F** Nanochannel Platform for the Controlled Delivery of ChemotherapeuticsA. GRATTONI¹, H. SHEN¹, D. FINE¹, A. ZIEMYS¹, J. GILL¹, AND M. FERRARI^{1,2}¹The University of Texas Health Science Center at Houston, Houston, TX, ²The 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. NELSON¹¹Princeton University, Princeton, NJ**10:45AM OP-8-1-15B** Adipose Derived Stem Cells and Their Role in Breast Cancer StiffeningB. SEO¹, E. M. CHANDLER¹, D. TIMS¹, M. BUCKLEY¹, I. COHEN¹, AND C. FISCHBACH¹¹Cornell University, Ithaca, NY**11:00AM OP-8-1-15C** Cell-Mediated Differences Between Vascular And Valvular CalcificationZ. FERDOUS¹, H. JO², AND R. M. NEREM³¹Georgia Institute of Technology, Atlanta, GA, ²Emory University, Atlanta, GA, ³Georgia Tech/Emory Center (GTEC), Atlanta, GA**11:15AM OP-8-1-15D** Persistent Hepatitis C Virus Infection in Microscale Primary Human Hepatocyte CulturesA. PLOSS¹, S. KHETANI², C. T. JONES¹, A. J. SYDER³, K. TREHAN⁴, V. A. GAYSINSKAYA⁵, K. MU¹, K. RITOLA¹, C. M. RICE¹, AND S. N. BHATIA⁴¹The Rockefeller University, New York, NY, ²Hepregen Corporation, Medford, MA, ³Therx Pharmaceuticals, San Diego, CA, ⁴Massachusetts Institute of Technology, Cambridge, MA, ⁵Johns Hopkins University, New York, NY**11:30AM OP-8-1-15E** Influence of GAG Identity on SMC Foam Cell FormationA. C. JIMENEZ¹, D. MUNOZ-PINTO¹, D. ORTIZ², AND M. HAHN¹¹Texas A&M University, College Station, TX, ²Texas A&M University, College Station, TX**11:45AM OP-8-1-15F** Modeling Shock Response of Human Head Using Fluid Structure Interaction (FSI)N. CHANDRA¹, L. GU¹, S. G. GANPULE¹, AND E. PLOUGONVEN¹¹University 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. ELDRIDGE¹, A. SEGGIO¹, A. NORDBERG¹, G. PAOLILLO¹, AND D. THOMPSON¹¹Rensselaer Polytechnic Institute, Troy, NY**10:45AM OP-8-1-16B** Retinal Scaffolds: Synaptic and Stem Cell IntegrationJ. HERTZ¹, E. LAVIK², AND J. L. GOLDBERG¹¹University of Miami, Miami, FL, ²Case Western Reserve, Cleveland, OH**11:00AM OP-8-1-16C** Effects of Environment Dimensionality on DRG Neurons: 3D Better Mimics In Vivo FeaturesA. RIBEIRO¹, E. POWELL², AND J. LEACH¹¹UMBC, Chemical & Biochemical Engineering, Baltimore, MD, ²University 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. LIU¹, J. R. MORGAN¹, AND D. HOFFMAN-KIM¹¹Brown University, Providence, RI**11:30AM OP-8-1-16E** 3D Culture Models to Study Paracrine Signaling Between Endothelial and Brain Tumor Stem CellsD. W. INFANGER¹, S. C. LIU¹, D. GURSEL², J. A. BOOCKVAR², AND C. FISCHBACH¹¹Cornell University, Ithaca, NY, ²Weill 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. ASHTON¹, A. CONWAY¹, C. PANGARKAR², M. BISSELL², AND D. V. SCHAFER¹¹University of California Berkeley, Berkeley, CA, ²Lawrence 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. FOK¹, Y. F. FEI¹, A. LI¹, A. CHOE¹, W. KOURY¹, A. MCLAUGHLIN¹, AND M. WINEK¹
¹Washington 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. DORFMAN¹, B. KEELEY¹, D. SALUME¹, D. SHIN¹, N. BOUGRAB¹, G. BARROS¹, X. HU¹, S. BROWN¹, P. PODDAR¹, AND S. KIM¹¹Johns Hopkins University, Baltimore, MD**PS-8B-1-3** Hand-Cranked Hypertension Screening Device to Detect PreeclampsiaM. TRACHTENBERG¹, G. JAYARAM¹, S. LEE¹, S. ACHARYA¹, N. THAKOR¹, AND H. SANGHVI²¹The Johns Hopkins University, Baltimore, MD, ²JHPIEGO, Baltimore, MD**PS-8B-1-4** Feasibility of Enhanced Algorithms for Post-Crash Injury Prediction for Improved Field TriageS. M. COMAS¹, AND H. C. GABLER¹¹Virginia Tech, Blacksburg, VA**PS-8B-1-5** Design and Development of a Low-Cost SpirometerJ. GLYNN¹, A. DIAS¹, J. SCHAEFER¹, A. BREMER¹, AND D. VAN SICKLE¹¹University of Wisconsin - Madison, Madison, WI**PS-8B-1-6** Removing Population Structure in Genome-Wide Association Studies Using Supervised MethodsA. B. DICKS¹, R. PARRY¹, AND M. D. WANG¹¹Georgia Institute of Technology, Atlanta, GA**PS-8B-1-7** Low-Cost EKG Proposed for the State of Chihuahua, MexicoB. A. RODRIGUEZ¹, S. L. MONTES¹, AND R. AGUILAR¹¹ITESM 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. GREIS¹, M. DANILEVICH¹, S. MERUGUMALA¹, K. HATTAWAY¹, AND K. GLASS¹¹Engineering World Health University of Texas, Austin, TX**PS-8B-1-10** Mercer on Mission Prosthetic Knee JointL. A. ELLIOTT¹, C. BUTLER¹, AND S. V. LADSON¹¹Mercer University, Macon, GA**PS-8B-1-11** Reusable Digital Manometer for Diagnosis of Cryptococcal Meningitis in Resource-Poor SettingsM. S. FIFER¹, A. W. CHENG¹, S. C. STENDER², N. V. THAKOR¹, H. C. SANGHVI², AND S. ACHARYA¹¹Johns Hopkins University, Baltimore, MD, ²Jhpiego, Baltimore, MD**PS-8B-1-12** Engineering Outside of the Classroom: Lessons From Engineers Without Borders at University of WashingtonJ. A. CALLIHAN¹¹University 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. THOMAS¹, J. BALTER¹, AND S. J. HOLLISTER¹¹University of Michigan, Ann Arbor, MI**PS-8B-2-14** Monte Carlo Simulations and Experimental Measurements for Chronic Wound Assessment with Diffuse NIRX. MAO¹, AND E. S. PAPAZOGLU¹¹Drexel University, Philadelphia, PA**PS-8B-2-15** Synthetic Ferritin Nanocores as a MRI Contrast AgentB. SANA¹, AND S. LIM¹¹Nanyang Technological University, Nanyang, Singapore**PS-8B-2-16** A Contrast Enhancement Filter for improving Stent Visibility in Interventional X-Ray FluoroscopyY. JIANG¹, AND L-H. CHANG¹¹University of Central Oklahoma, Edmond, OK**PS-8B-2-17** A Novel Algorithm for 3D Model Reconstruction from Bi-Planar Angiogram ImagesW. A. STOY¹¹North Carolina State University, Raleigh, NC**PS-8B-2-18** Three-dimensional Quantification and Visualization Model for Drug Delivery in EyesY-T. TSAI¹, W. HU², AND L. TANG¹¹University of Texas at Arlington, Arlington, TX, ²Progenitec Inc., Arlington, TX**PS-8B-2-19** Microfluidic Approaches for Synthesis of Microbubble-based MaterialsJ. WAN¹, AND H. STONE¹¹Princeton University, Princeton, NJ**PS-8B-2-20** Combined Mechanical and Optical Simulation of Tissue During Application of Optical Clearing DevicesW. C. VOGT¹, A. IZQUIERDO-ROMAN¹, A. A. GURJARPADHYE¹, AND C. G. RYLANDER¹¹Virginia Polytechnic Institute and State University, Blacksburg, VA**PS-8B-2-21** Advanced Microscopic Analysis of the Attachment Mechanism of *Giardia lamblia*S. LENAGHAN¹, K. WHITE¹, Z. ZHANG¹, AND M. ZHANG¹¹University of Tennessee, Knoxville, TN**PS-8B-2-22** Towards *In Vivo* Toxicity of Gadolinium-Single Walled Carbon Nanotubes as MRI Contrast ProbesP. K. AVTI¹, K. R. SHROYER¹, AND B. SITHARAMAN¹¹Stony Brook University, Stony Brook, NY**PS-8B-2-23** Laser-induced Lipolysis Using Fiberoptic MicroneedlesM. A. KOSOGLU¹, C. YE¹, R. L. HOOD¹, AND C. G. RYLANDER¹¹Virginia Tech, Blacksburg, VA**PS-8B-2-24** Model Assisted MR Thermometry for Laser Induced Thermal TherapyJ. P. YUNG^{1,2}, D. FUENTES¹, A. M. ELLIOTT¹, R. J. STAFFORD¹, AND J. D. HAZLE¹¹The University of Texas M.D. Anderson Cancer Center, Houston, TX, ²The 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^{1,2}, R. L. MANTHE¹, T. K. JAIN¹, S. K. DIMITRIJEVIC¹, AND V. LABHASETWAR^{1,3}¹Cleveland Clinic, Cleveland, OH, ²Cleveland Clinic Lerner College of Medicine of Case Western Reserve University, Cleveland, OH, ³Taussig Cancer Institute, Cleveland, OH

PS-8B-2-26 Computational Model for Predicting Drug Distribution in the Human Brain Using DTIY. RAWASH¹, O. IVANCHENKO¹, N. SINDHWANI¹, AND A. LINNINGER¹
¹University of Illinois at Chicago, Chicago, IL**PS-8B-2-27** Acoustically Sensitive Microcapsules for Ultrasound-based Localized Drug DeliveryN. PHIPPS¹, M. MOBED-MIREMADI¹, AND M. KERALAPURA¹
¹San 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. ZHU¹, L. DING¹, W. B. ZHANG², D. L. DICKENS², AND J. A. KING³
¹University of Oklahoma, Norman, OK, ²Minnesota Epilepsy Group, St. Paul, MN, ³University 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. WIJESINGHE¹, B. D. DOLASINSKI¹, AND B. J. ROTH²
¹Ball State University, Muncie, IN, ²Oakland 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. PATEL¹, AND J. LEE¹
¹University of Cincinnati, Cincinnati, OH**PS-8B-3-31** Monte Carlo Modeling of *In Vivo* Phosphorescence -lifetime-based pO₂ MeasurementsM. A. DAVIS¹, A. PONTICORVO¹, AND A. K. DUNN¹
¹The University of Texas at Austin, Austin, TX**PS-8B-3-32** Intraoperative Laser Speckle Contrast Imaging for Monitoring Cerebral Blood FlowL. M. RICHARDS¹, A. B. PARTHASARATHY¹, E. L. WEBER¹, M. G. BURNETT², D. J. FOX², AND A. K. DUNN¹
¹University of Texas at Austin, Austin, TX, ²St. David's Hospitals, Austin, TX**PS-8B-3-33** Comparison of Indocyanine Green Fluorescence and Laser Speckle Contrast ImagingE. L. WEBER¹, L. M. RICHARDS¹, A. B. PARTHASARATHY¹, S. M. KAZMI¹, AND A. K. DUNN¹
¹University of Texas at Austin, Austin, TX**PS-8B-3-34** Imaging Schwann Cell High Affinity Nerve Growth Factor Receptors Using Atomic Force MicroscopyR. WILLIAMSON¹, AND C. MILLER¹
¹Saint Louis University, St. Louis, MO**PS-8B-3-35** *In Vitro* Refractive Index Measurement of Acute Rat Brains Using Optical Coherence TomographyJ. SUN¹, S. LEE¹, M. SARNTINORANONT¹, AND H. XIE¹
¹University of Florida, Gainesville, FL**PS-8B-3-36** Simultaneous Dynamic and Functional MRI of SpeechT. L. PAINE¹, B. SUTTON¹, AND C. CONWAY¹
¹University of Illinois Urbana-Champaign, Urbana, IL**PS-8B-3-37** Reassessing the Ubiquity of Small-world NetworksQ. K. TELESFORD¹, K. E. JOYCE¹, S. HAYASAKA¹, J. H. BURDETTE¹, AND P. J. LAURIENT¹
¹Wake Forest University Health Sciences, Winston-Salem, NC**PS-8B-3-38** Cortical Oxygenation Sensing Using Ruthenium-based Fluorescence Lifetime Imaging and 2P MicroscopyA. J. SALVAGGIO¹, A. D. ESTRADA¹, S. M. KAZMI¹, AND A. K. DUNN¹
¹The University of Texas at Austin, Austin, TX**PS-8B-3-39** Accurate Brain Infarction Volume Estimation Based on Image MappingA. DAWKINS¹, AND W. ZHAO¹
¹University of Miami, Coral Gables, FL**PS-8B-3-40** Chronic Cerebral Blood Flow Imaging with Multi-Exposure Speckle ImagingS. M. KAZMI¹, A. B. PARTHASARATHY¹, AND A. K. DUNN¹
¹The 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. ESTRADA¹, S. M. KAZMI¹, A. SALVAGGIO¹, AND A. K. DUNN¹
¹University of Texas at Austin, Austin, TX**PS-8B-3-42** Development of Amyloid-beta Targeting Nanoparticles for Imaging and TherapyE. A. TANIFUM¹, I. DASGUPTA¹, L. SUN², I. DHANDE², K. B. GHAGHADA¹, A. V. ANNAPRAGADA¹, AND J. ERIKSEN²
¹University of Texas Health Science Center at Houston, Houston, TX, ²University of Houston, Houston, TX**PS-8B-3-43** Development of Methods for the Study of Traumatic Brain Injury Investigated Via Advanced ImagingB. M. VAUGHN¹, B. JORTNER², AND W. HARDY¹
¹Virginia Tech, Blacksburg, VA, ²Virginia-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. SHI¹, AND B. FU¹
¹City College of New York, New York, NY**PS-8B-4-45** Paracrine Influences on Aortic Endothelial Hydraulic ConductivityR. MATHURA¹
¹The 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. AMIN¹, A. KUNKEL², V. LE¹, AND J. E. WAGENSEIL¹
¹St. Louis University, St. Louis, MO, ²Rice University, Houston, TX**PS-8B-5-47** Effect of Cigarette Smoking on Arterial Stiffness Re-interpreted Using a Structurally-based ModelM. S. ENEVOLDSEN^{1,2}, J. D. HUMPHREY², L. LÖNN³, J. A. JENSEN¹, AND K-A. HENNEBERG¹
¹Technical University of Denmark, Kongens Lyngby, Denmark, ²Texas A&M University, College Station, TX, ³Rigshospitalet, Denmark, Copenhagen, Denmark**PS-8B-5-48** CANCELED**PS-8B-5-49** Evaluation of Digital Replantation Surgery Using PhotoplethysmographyK. C. NAM¹, K. H. JANG², AND D. W. KIM¹
¹Yonsei University Health System, Seoul, Korea, Republic of, ²Yonsei University, Seoul, Korea, Republic of

PS-8B-5-50 Directing Vascular Function by Modulating Vascular StructureP. W. ALFORD^{1,2}, A. P. NESMITH¹, J. N. SEYWERD¹, AND K. K. PARKER^{1,2}¹Disease Biophysics Group, Harvard University, Cambridge, MA, ²Wyss Institute for Biologically Inspired Engineering, Boston, MA**PS-8B-5-51** Vascular Changes in Type 2 Diabetes Mellitus: Application to Restenosis After StentingH. WANG¹, L. M. ELLWEIN¹, J. R. KERSTEN², AND J. F. LADISA^{1,2}¹Marquette University, Milwaukee, WI, ²Medical College of Wisconsin, Milwaukee, WI**PS-8B-5-52** Relation Between Mechanical Properties and Histology of Aortic Aneurysms Evaluated in a Rupture TestS. SUGITA^{1,2}, T. MATSUMOTO^{1,2}, T. OHASHI², K. KUMAGAI², H. AKIMOTO², K. TABAYASHI², AND M. SATO²¹Nagoya Institute of Technology, Nagoya, Japan, ²Tohoku University, Sendai, Japan**PS-8B-5-53** Inverted DTM – A Possible Solution to the Cold Finger ProblemM. W. AKHTAR¹, S. J. KLEIS¹, AND R. W. METCALFE¹¹University of Houston, Houston, TX**PS-8B-5-54** Ionizing Irradiation Alters Aortic Elasticity Measured as Pulse Wave Velocity.Y-Y. LIU¹, M. BUTLIN¹, T. KNITTEL², R. SMEE², AND A. AVOLIO¹¹Australian School of Advanced Medicine, Sydney, NSW, Australia, ²Prince of Wales Hospital, Sydney, NSW, Australia**PS-8B-5-55** Effects of Sleep Deprivation on Autonomic Nervous SystemD. W. KIM¹, D. I. YANG², K. C. NAM¹, AND M. K. KWON¹¹Yonsei University Health System, Seoul, Korea, Republic of, ²Yonsei 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. KEEGAN¹, B. E. GEE², AND M. O. PLATT¹¹Georgia Institute of Technology, Atlanta, GA, ²Morehouse School of Medicine, Atlanta, GA**PS-8B-5-57** Regional Atherosclerotic Plaque Properties as Measured by Atomic Force MicroscopyH. N. HAYENGA¹, A. TRACHE^{1,2}, J. P. TRZECIAKOWSKI², AND J. D. HUMPHREY¹¹Texas A&M University, College Station, TX, ²Texas A&M Health Science Center, College Station, TX**PS-8B-5-58** Variable Glycated Serum Albumin Modulates Endothelial Cell Culture ConditionsD. A. RUBENSTEIN¹, Z. MARIA¹, B. E. MORTON¹, AND W. YIN¹¹Oklahoma State University, Stillwater, OK**PS-8B-5-59** ROS Signaling Modulates Enhanced Cell Proliferation and Intimal Hyperplasia in HSV Cultured Ex VivoB. JODDAR¹, R. K. REEN¹, M. FIRSTENBERG¹, AND K. J. GOOCH¹¹The Ohio State University, Columbus, OH**PS-8B-5-60** Elastin Degradation Reduces the Structure Stability of ArteriesB. HAN¹, A. NORTHCUTT¹, AND H-C. HAN¹¹University of Texas at San Antonio, San Antonio, TX**PS-8B-5-61** Mechanical Measurements of the Sub-Endothelial Layer in Arteries using IndentationJ. M. PELOQUIN¹, J. HUYNH¹, AND C. A. REINHART-KING¹¹Cornell University, Ithaca, NY**PS-8B-5-62** *In Vitro* Mechanical Testing of Hydration-Controlled Arterial TissueD. SHAHMIRZADI¹, AND A. H. HSIEH¹¹University of Maryland, College Park, MD**PS-8B-5-63** Spatiotemporal Dynamics of Vasoconstriction in Small ArteriesS. PINTO¹, S. YASOTHARAN¹, J. YANG¹, J. VOIGTLÄNDER-BOLZ², M. SAUVE¹, C. LOCHOVSKY¹, S-S. BOLZ¹, AND A. GÜNTHER¹¹University of Toronto, Toronto, Ontario, Canada, ²St. 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. MORTON¹, W. YIN¹, AND D. A. RUBENSTEIN¹¹Oklahoma State University, Stillwater, OK**PS-8B-5-65** A Balance Point Approach to Characterize Adaptation of Arterial NetworksS. F. KNEZEK¹, P. H. NGUYEN¹, AND C. M. QUICK¹¹Michael 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. RAZAVI¹, S. ZARAFSHAR¹, H. SAWADA¹, C. XU¹, J. A. FEINSTEIN¹, AND C. A. TAYLOR¹¹Stanford University, Stanford, CA**PS-8B-5-67** Inverse Mechanics of Cardiovascular TissuesR. RAGHUPATHY¹, C. M. WITZENBURG¹, A. OLTEAN¹, S. P. LAKE¹, AND V. BAROCAS¹¹U. Minnesota, Minneapolis, MN**PS-8B-5-68** The Elastic and Viscoelastic Behaviors of Aortic Elastin NetworkY. ZOU¹, AND K. Y. ZHANG¹¹Boston University, Boston, MA**PS-8B-5-69** Role of HIV Proteins in Biomechanically Mediated Protease Activity and Arterial RemodelingI. KENNEDY¹, L. HANSON¹, J. RAYKIN¹, R. SUTLIFF², R. GLEASON¹, AND M. PLATT¹¹Georgia Tech, Atlanta, GA, ²Emory, Atlanta, GA**PS-8B-5-70** Surface Characterization and Adhesion Properties of Decellularized HUVL. P. JACKSON¹, P. MCFETRIDGE², M. NOLLERT¹, AND C. TOWNSEND¹¹University of Oklahoma, Norman, OK, ²University 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. WU¹, K. C. LEE¹, R. B. DICKINSON¹, AND T. P. LELE¹¹University of Florida, Gainesville, FL**PS-8B-6-72** Cytotoxicity of Ultrashort Electric Pulse Exposure in Multiple Cell TypesB. L. IBEY¹, C. C. ROTH², J. A. BERNHARD¹, D. R. DALZELL¹, G. J. WILMINK¹, AND A. G. PAKHOMOV³¹Air Force Research Laboratory, Brooks City-Base, TX, ²General Dynamics IT, Brooks City-Base, TX, ³Old Dominion University, Norfolk, VA**PS-8B-6-73** Structural and Geometric Effects in a Synthetic System of Exactly Two Kinesin-I MotorsJ. DRIVER¹, A. ROGERS¹, D. K. JAMISON¹, R. DAS¹, A. KOLOMEISKY¹, AND M. DIEHL¹¹Rice University, Houston, TX**PS-8B-6-74** Electromechanical Coupling in the Membrane-Protein Motor Complex Associated with PrestinN. NILSEN¹, W. E. BROWNELL², S. X. SUN¹, AND A. A. SPECTOR¹¹Johns Hopkins University, Baltimore, MD, ²Baylor College of Medicine, Houston, TX**PS-8B-6-75** Electrical Resistivity Changes in Splenic Tissue Under CompressionR. E. DODDE¹, AND A. SHIH¹¹University of Michigan, Ann Arbor, MI**PS-8B-6-76** Estimation of Microtubule GTP Cap Size *In Vivo*D. SEETAPUN¹, AND D. J. ODDE¹¹University of Minnesota, Minneapolis, MN

PS-8B-6-77 Pericellular Conditions Regulate Extent of Cell-mediated Compaction of Collagen GelsM. D. STEVENSON¹, A. L. SIEMINSKI², C. M. MCLEOD², F. J. BYFIELD³, V. H. BAROCAS⁴, AND K. J. GOOCH¹¹Ohio State University, Columbus, OH, ²Franklin W. Olin College of Engineering, Needham, MA, ³University of Pennsylvania, Philadelphia, PA, ⁴University of Minnesota, Minneapolis, MN**PS-8B-6-78** Metabolic Flux Determination in Perfused Livers by Mass Balance Analysis: Effect of FastingM. A. ORMAN¹, I. ANDROULAKIS¹, F. BERTHIAUME¹, AND M. IERAPETRIOTOU¹¹Rutgers University, Piscataway, NJ**PS-8B-6-79** Retinoic Acid-Induced Smooth Muscle Differentiation From Progenitor Cells is Regulated by ECM CuesE. LOGSDON¹, J. PERLEY¹, Q. GAN¹, A. SOMLYO¹, G. OWENS¹, AND T. SKALAK¹¹University of Virginia, Charlottesville, VA**PS-8B-6-80** Insights from Modeling Natural Killer Cell Proliferative Responses to Cytokine StimulationY. M. ZHAO¹, AND A. R. FRENCH²¹Washington University in St. Louis, Saint Louis, MO, ²Washington University School of Medicine, Saint Louis, MO**PS-8B-6-81** Influence of Subcellular Structures on Single Vascular Smooth Muscle Cell MechanicsS. T. WOOD¹, B. C. DEAN¹, AND D. DEAN¹¹Clemson University, Clemson, SC**PS-8B-6-82** An Experimental Study on Cell Membrane Transport During Desiccation for BiopreservationJ. L. JIMENEZ-RIOS¹, S. BHOWMICK¹, AND A. J. FOWLER¹¹University of Massachusetts Dartmouth, North Dartmouth, MA**PS-8B-6-83** A Coarse-Grain Molecular Dynamics Model for Sickle Hemoglobin FibersH. LI¹, AND G. LYKOTRAFITIS¹¹University of Connecticut, Storrs, CT**PS-8B-6-84** Uncovering Morphological and Morphogenetic Features in Epithelia by Eliminating Statistical BiasM. P. MIKLUS¹, AND S. HILGENFELDT^{1,2}¹Northwestern University, Evanston, IL, ²University of Illinois at Urbana-Champaign, Urbana, IL**PS-8B-6-85** Computational Model of Force Propagation in Fibrous Extracellular MatrixX. MA¹, K. J. GOOCH¹, S. N. GHADIALI¹, AND R. T. HART¹¹The Ohio State University, Columbus, OH**PS-8B-6-86** Expanding the Genetic Code in Mammalian CellsL. XIANG¹, K. MONCIVAIS¹, AND Z. J. ZHANG¹¹University of Texas at Austin, Austin, TX**PS-8B-6-87** Single Cell Based Modeling of Epithelial Tissue: A Biomechanical ApproachY. JAMALI¹, M. AZIMI¹, AND M. MOFRAD¹¹University of California Berkeley, Berkeley, CA**PS-8B-6-88** Modulating the Cellular Accumulation of Toxic Misfolded Alpha-synucleinK. KILPATRICK¹, AND L. SEGATORI¹¹Rice University, Houston, TX**PS-8B-6-89** Type-I Collagen Gels are Structurally and Mechanically Inhomogeneous and AnisotropicX. MA¹, M. WEBER¹, M. STEVENSON¹, K. J. GOOCH¹, S. N. GHADIALI¹, AND R. T. HART¹¹The 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. MACDONALD¹, AND M. J. LAZZARA¹¹University 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. PARK¹, AND M. J. MCSHANE¹¹Texas A&M University, College Station, TX**PS-8B-7-92** The Effect of Substrate Topography on Endocytosis and TransfectionA. F. ADLER¹, AND K. W. LEONG¹¹Duke University, Durham, NC**PS-8B-7-93** Proximal Effects of Ultraviolet Light Absorbers and Polymer Matrix in the Photo-Protection of [beta]-CaroteneK. MORABITO¹, K. GILIDA², N. SHAPELY², AND A. TRIPATHI¹¹Brown University, Providence, RI, ²Rutgers University, New Brunswick, NJ**PS-8B-7-94** Micro-Encapsulation as a Means to Modulate Nanomaterial-Cell InteractionsD. W. RITTER¹, A. A. ROMOSER¹, R. MAJITHIA¹, K. E. MEISSNER¹, C. M. SAYES¹, AND M. J. MCSHANE¹¹Texas A&M University, College Station, TX**PS-8B-7-95** Nanoscopic Mechanical Anisotropy in Hydrogel SurfacesM. FLORES-MERINO^{1,2}, S. CHIRASATISIN³, C. LOPRESTI^{1,2}, G. REILLY², A. ENGLER³, AND G. BATTAGLIA¹¹University of Sheffield, Western Bank, Sheffield, United Kingdom, ²University of Sheffield, Broad Lane, Sheffield, United Kingdom, ³University of California, San Diego, La Jolla, CA**PS-8B-7-96** Patterning and Topographical Control of PEG Hydrogel Micro/Nanostructure by Dip-pen Nanolithography[®]J-W. JANG¹, P. STILES¹, AND S. R. NETTIKADAN¹¹Nanolnk Inc., Skokie, IL**PS-8B-7-97** Micropatterning Polymeric Nanofibers with PEG Hydrogel for Application of Protein MicroarrayY. LEE¹, H. LEE¹, K. SON¹, S. PARK¹, S. NAM¹, Y. PARK¹, AND W-G. KOH¹¹Yonsei 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. KUO¹, R. ZHANG¹, AND W. KO¹¹Case Western Reserve University, Cleveland, OH**PS-8B-7-99** Effect of Size on Nanoparticle Uptake in a Vascular Endothelial Cell Model of AngiogenesisA. L. DOIRON¹, J. SPENCER¹, AND K. D. RINKER¹¹University of Calgary, Calgary, Alberta, Canada**PS-8B-7-100** Window into a Microworld: Microfluidic System for Studying Microbial Growth in Porous MediaD. A. MARKOV¹, P. C. SAMSON¹, D. K. SCHAFER¹, A. DHUMMAKUPT¹, J. P. WIKSWO¹, AND L. M. SHOR²¹Vanderbilt University, Nashville, TN, ²University of Connecticut, Storrs, CT**PS-8B-7-101** Influence of TiO₂ Nanotube Crystallinity on Cell BehaviourG. SMITH¹, K. KOLIND², M. FOSS², F. BESENBACHER², AND S. JIN¹¹University of California San Diego, La Jolla, CA, ²Aarhus University, Aarhus, Denmark**PS-8B-7-102** Understanding the Mechanics of the Insect Respiratory System Could Advance Tissue EngineeringM. R. WEBSTER¹, J. TWIGG¹, J. J. SOCHA¹, AND R. DE VITA¹¹Virginia Polytechnic Institute and State University, Blacksburg, VAPS = Poster Session
OP = Oral Presentation

PS-8B-7-103 Decreased Lung Carcinoma Cell Function on Select Polymer Nanometer Surface FeaturesL. ZHANG¹, AND T. WEBSTER¹¹Brown University, providence, RI**PS-8B-7-104** Process Characterization: Reactive Ion Etching of Micro Hot-embossed Poly(lactic acid) FilmsR. TEWARI^{1,2}, K. L. VANGA^{1,2}, V. R. KNUDSEN^{1,2}, AND C. FRIEDRICH^{1,2}¹Michigan Technological University, Houghton, MI, ²Multi Scale Technologies Institute, Houghton, MI**PS-8B-7-105** Decreased Attachment of Epithelial Cells and Bacteria to Lubricin Coated Intraocular LensesG. E. ANINWENE II¹, E. TAYLOR¹, T. J. WEBSTER¹, AND G. D. JAY¹¹Brown University, Providence, RI**PS-8B-7-106** Improvement of Nanofiber Morphology through Electrospinning Process PausingD. KARATAS¹, K. M. SAWICKA¹, AND S. R. SIMON¹¹Stony Brook University, Stony Brook, NY**PS-8B-7-107** The Bio-Assembler: 3D Cell Culturing Using Magnetic LevitationC. S. FILGUEIRA¹, C. P. BERTUCCI¹, AND G. R. SOUZA¹¹Nano³D Biosciences, Inc., Houston, TX**PS-8B-7-108** Chitosan Enhances Cell Adhesion and Spreading on Nanocomposite FilmsA. K. GAHARWAR¹, P. J. SCHEXNAIDER¹, C.-J. WU¹, Q. JIN¹, AND G. SCHMIDT¹¹Purdue University, West Lafayette, IN**PS-8B-7-109** UV-Modulated Elastomeric Microstructures for Studying Cell MechanicsL-T. JIANG¹, R. OKADA¹, AND J. FU¹¹University of Michigan, Ann Arbor, MI**PS-8B-7-110** Bacterial Catch-and-Release Using Thermally Responsive Multiphoton Fabricated Protein HydrogelsJ. L. CONNELL¹, E. T. RITSCHDORFF¹, M. WHITELEY¹, AND J. B. SHEAR¹¹The 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. BORWANKAR¹, K. YOON¹, L. L. MA¹, M. MEHRMOHAMMADI¹, B. WILLSEY¹, K. SOKOLOV^{1,2}, S. EMELIANOV¹, AND K. JOHNSTON¹¹The University of Texas at Austin, Austin, TX, ²UT M.D. Anderson Cancer Center, Austin, TX**PS-8B-7-112** Spatially Controlled Electrospun Solid Gradient Nanofibers for Guided Spiral Ganglion Neuron CultureP. F. JAO¹, W. SUN², Y. K. YOON¹, AND G. J. KIM³¹Dept. of Electrical Engineering, University at Buffalo, The State University of New York, Buffalo, NY, ²Dept. of Communicative Disorders & Sciences, University at Buffalo, The State University of New York, Buffalo, NY, ³Dept. 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. MACHADO¹, K. TARQUINIO², AND T. WEBSTER¹¹Brown University, Providence, RI, ²Rhode Island Hospital, Providence, RI**PS-8B-7-114** "The Disappearing Substrate": SiO₂ Etch Rate by Common Buffers in Genomic and Proteomic TechnologyS. AHN¹, P. SPUHLER¹, M. CABODI¹, AND S. UNLU¹¹Boston University, Boston, MA**PS-8B-7-115** Polystyrene Microlens Array by Shrink-induced PDMS MoldD. DYER¹, S. SHREIM¹, S. JAYADEV¹, D. TAYLOR¹, V. LEW¹, E. BOTVINICK¹, AND M. KHINE¹¹University 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. NAIN¹, AND G. MICHALOPOULOS²¹Virginia Tech, Blacksburg, VA, ²University of Pittsburgh, Pittsburgh, PA**PS-8B-7-117** Silk for High Fidelity MicromoldingD. N. BRESLAUER¹, F. B. MYERS¹, E. P. LEE¹, B. W. TURNER¹, S. J. MULLER¹, AND L. P. LEE¹¹UC Berkeley, Berkeley, CA**PS-8B-7-118** Fabrication of Quantum Dot-Protein Arrays and their Application in Cell Adhesion AssaysZ. R. TAYLOR¹, AND D. W. SCHMIDTKE¹¹University 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. DEB¹, W-D. HUANG¹, AND J-C. CHIAO¹¹University of Texas at Arlington, Arlington, TX**PS-8B-8-120** Photosynthetically Active Protoplasts for Power Scavenging – Absorbance and Optical Density AnalysisA. SHAHID¹, A. ILYAS¹, N. OBUAREDDY¹, M. H-C. JIN¹, M. MELOTTO¹, AND S. M. IQBAL¹¹University 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. LI¹, M. YEN¹, AND D. J. IRVINE^{1,2}¹Massachusetts Institute of Technology, Cambridge, MA, ²Howard Hughes Medical Institute, Chevy Chase, MD**PS-8B-9-122** Carbohydrate Surface Modification for Oral Protein DeliveryM. A. PHILLIPS¹, AND N. A. PEPPAS¹¹The University of Texas at Austin, Austin, TX**PS-8B-9-123** Nanoparticulate Delivery of Targeted Immunotherapies for Inflammatory Bowel DiseaseN. CAPURSO¹, M. LOOK¹, R. RAGHEB¹, S. DEMENTO¹, C. ABRAHAM¹, AND T. FAHMY¹¹Yale University, New Haven, CT**PS-8B-9-124** A Novel Vaccine ParadigmK. SAWICKA¹, AND S. SIMON¹¹Stony Brook University, Stony Brook, NY**PS-8B-9-125** Fluoride Release from Dental Cement with Different Redox SystemsJ. LEE¹, AND B. SUH¹¹Bisco 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. CHIRRA¹, D. SPENCER¹, AND J. HILT¹¹University 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^{1,2}, M. K. LEACH², Y. NAIM², AND J. M. COREY^{2,3}¹Southeast University, Nanjing, China, People's Republic of, ²University of Michigan, Ann Arbor, MI, ³VAMC, Ann Arbor, MI**PS-8B-11-128 A Novel Microfluidic Platform for Axon-Specific Injury**S. HOSMANE¹, A. VENKATESAN¹, AND N. THAKOR¹¹Johns Hopkins University, Baltimore, MD**PS-8B-11-129 Translational Technology for Neural Protection: HPLC Quantification of Timolol Maleate Drug-Delivery**A. SHOFFSTALL¹, E. LAVIK¹, A. DUMITRESCU², M. KUEHN², AND Y. KWON²¹Case Western Reserve University, Cleveland, OH, ²University of Iowa, Iowa City, IA**PS-8B-11-130 Transparent CUPE Nerve Guides Allow Evaluation of Luminal Fillers and Mediate Nerve Gap Repair**S. DASH¹, R. TRAN¹, J. YANG¹, AND M. ROMERO-ORTEGA¹¹University of Texas at Arlington, Arlington, TX**PS-8B-11-131 Addition of Chitosan to Tissue Engineering Hydrogels for Neural Regeneration Applications**J. M. ZUIDEMA¹, M. M. PAP², E. J. MINNER², D. B. JAROCH³, F. A. MORRISON², AND R. J. GILBERT¹¹Rensselaer Polytechnic Institute, Troy, NY, ²Michigan Technological University, Houghton, MI, ³Purdue University, West Lafayette, IN**PS-8B-11-132 Development of a Composite Hydrogel Containing Electrospun Fibers for Spinal Cord Injury**C. J. RIVET¹, H. WANG², AND R. J. GILBERT¹¹Rensselaer Polytechnic Institute, Troy, NY, ²Syracuse University, Syracuse, NY**PS-8B-11-133 Electrospun Polycaprolactone/Elastin Aligned Fibrous Scaffolds for Schwann Cells**I-H. LIN¹, AND C. MILLER¹¹Saint Louis University, St. Louis, MO**PS-8B-11-134 Using micro-Computed Tomography to assess Transport Parameters through Fluid Spaces of the Cochlea**M. GLADSTONE¹, X. ZHU^{1,2}, A. LUEBKE¹, R. D. FRISINA^{1,2}, AND D. A. BORKHOLDER^{1,3}¹University of Rochester, Rochester, NY, ²National Technical Institute, Rochester Institute of Technology, Rochester, NY, ³Rochester Institute of Technology, Rochester, NY**PS-8B-11-135 Treatment of Spinal Cord Injury with Keratin Biomaterial Improves Survival and Recovery in Rats**B. FEARING¹, C. HARTLEY¹, O. DAYTON¹, L. PACE¹, L. BURNETT², T. ABOUSHWAREB¹, AND M. VAN DYKE¹¹Wake Forest University School of Medicine, Winston Salem, NC, ²KeraNetics, Winston Salem, NC**PS-8B-11-136 Analysis of CAMs and ECM Proteins on Schwann Cell-mediated Neurite Guidance**A. M. SEGGIO¹, A. NARAYANASWAMY¹, B. ROYSAM¹, S. AGUILAR¹, A. MCGREGOR¹, AND D. THOMPSON¹¹Rensselaer Polytechnic Institute, Troy, NY**PS-8B-11-137 The Functional Recovery of Neurons after Traumatic Brain Injury**M. K. KUTZING¹, C. LANGHAMMER¹, AND B. L. FIRESTEIN¹¹Rutgers University, Piscataway, NJ**PS-8B-11-138 Aligned Collagen Threads Direct Neuronal Growth Due to Microtopography Not Nanotopography**M. ABU-RUB¹, K. L. BILLIAR², B. RODRIGUEZ², D. ZEUGOLIS¹, AND A. PANDIT¹¹National University of Ireland, Dangan, Galway, Ireland, ²Worcester Polytechnic Institute, Worcester, MA, ³University College, Dublin, Leinster, Ireland**PS-8B-11-139 Design of Backflow-Free Catheters Based on Micro-fluid Dynamics**O. V. IVANCHENKO¹, E. LUESHEN¹, N. SINDHWANI¹, Y. RAWASH¹, AND A. LINNINGER¹¹UIC, Chicago, IL**PS-8B-11-140 Schwann Cell-Seeded Nanofiber Scaffolds Enhance and Direct Axonal Regeneration**M. R. MACEWAN¹, J. XIE¹, N. JESURAJ¹, D. SIEWE¹, X. LI¹, S. SAKIYAMA-ELBERT¹, AND Y. XIA¹¹Washington University, Saint Louis, MO**PS-8B-11-141 Tunable 3D Hyaluronic Acid Hydrogels for Differentiation of Progenitors into Dopamine Neurons**Z. Z. KHAING¹, S. K. SEIDLITS¹, K. SLIVERBERG¹, S. A. GEISSLER¹, AND C. E. SCHMIDT¹¹UT Austin, Austin, TX**PS-8B-11-142 Microfluidic Devices for Studying Intercellular Communication Between Dorsal Root Ganglia (DRG)**N. JAIN¹, B. J. PFISTER¹, AND R. PEREZ-CASTILLEJOS¹¹NJIT, Newark, NJ**PS-8B-11-143 Aligned 6-Aminonicotinamide Releasing PLLA Fibers for Repair of the Injured Spinal Cord**N. SCHAUB¹, AND R. J. GILBERT²¹Michigan Technological University, Houghton, MI, ²Rensselaer 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. RAMAN¹, J. JOSEPH², J. TANG², AND M. STOPFER²¹Washington University, St. Louis, MO, ²National 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. QI¹, A. R. KENT¹, AND W. M. GRILL¹¹Duke 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. SONG¹, R. H. CHAN¹, V. Z. MARMARELIS¹, R. E. HAMPSON², S. A. DEADWYLER², AND T. W. BERGER¹¹University of Southern California, Los Angeles, CA, ²Wake 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. ZHU¹, H. MAO¹, C. CHOU¹, C. WAGNER¹, X. JIN¹, A. D. LEONARDI¹, P. J. VANDEVORD¹, C. A. BIR¹, K. H. YANG¹, AND A. I. KING¹¹Wayne State University, Detroit, MIPS = Poster Session
OP = Oral Presentation

PS-8B-12-148 Power Flow in the Sandwich Model of the CochleaD. KIM^{1,2}, D. C. MOUNTAIN^{1,2}, AND A. E. HUBBARD^{1,2}¹Boston University, Boston, MA, ²Boston University Center for Hearing Research, Boston, MA**PS-8B-12-149 Macro- to Micro- Biomechanics of Traumatic Brain Injury**K. D. BROWNE¹, C. MIETUS¹, R. KRAFT², AND D. CULLEN¹¹University of Pennsylvania, Philadelphia, PA, ²U.S. Army Research Laboratory, Aberdeen Proving Ground, MD**PS-8B-12-150 Anatomically Detailed Micromechanical Model of the Organ of Corti Including Radial Microfluid Flow**B. F. ZAGADOU¹, P. E. BARBONE¹, AND D. C. MOUNTAIN¹¹Boston University, Boston, MA**PS-8B-12-151 Spatiotemporal Investigation of Gamma Activity in the Human Epileptic Brain**M. COTIC¹, O. C. ZALAY¹, T. VALIANTE², D. ANDRADE², P. L. CARLEN^{1,2}, AND B. L. BARDAKJIAN¹¹University of Toronto, Toronto, Ontario, Canada, ²Toronto Western Research Institute, Toronto, Ontario, Canada**PS-8B-12-152 FDEHMT: A Finite Difference Electromagnetic Head Modeling Toolbox**H. V. DANG¹, AND K. T. NG¹¹New Mexico State University, Las Cruces, NM**PS-8B-12-153 In Silico Investigation of Astrocytic Gliotransmission in Synaptic Signal Processing**V. R. TIRUVADI¹, P. SINGH¹, AND D. F. MEANEY¹¹University of Pennsylvania, Philadelphia, PA**PS-8B-12-154 Characterization of the Glial Scar using Raman Spectroscopy and Microindentation**T. SAXENA¹, B. DENG¹, J. GILBERT¹, D. STELZNER², J. CHAIKEN¹, AND J. HASENINKEL¹¹Syracuse University, Syracuse, NY, ²Upstate Medical University, Syracuse, NY**PS-8B-12-155 Assessment of Strain Patterns in the Brain from Head Acceleration from Collegiate Football Players**K. DANELSON¹, S. ROWSON², S. DUMA², AND J. STITZEL¹¹Virginia Tech/Wake Forest University SBES, Winston-Salem, NC, ²Virginia Tech/Wake Forest University SBES, Blacksburg, VA**PS-8B-12-156 Neural Network Connectivity and Mapping of In Vitro Circuits**T. P. PATEL¹, AND D. F. MEANEY¹¹University of Pennsylvania, Philadelphia, PA**PS-8B-12-157 A Temporal Backpropagation Algorithm for the Resonate and Fire Perceptron**H. MUKHOPADHY¹, AND J. TRANQUILLO¹¹Bucknell 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 Models**A. KUMAR¹¹Ethicon inc, Somerville, NJ**PS-8B-13-159 Isolation and Culture of Contractile Myotubes from Insect Cells for Bioactuation Applications**A. L. BARYSHYAN¹, B. A. TRIMMER¹, AND D. L. KAPLAN¹¹Tufts University, Medford, MA**PS-8B-13-160 A Spin Drying Technique for Dry Preservation of Mammalian Cells**N. CHAKRABORTY^{1,2}, M. A. MENZES³, S. C. HAND³, AND M. TONER^{1,2}¹Center for Engineering in Medicine, Harvard Medical School, Boston, MA, ²BioMEMS Resource Center, Massachusetts General Hospital, Charlestown, MA, ³Louisiana State University, Baton Rouge, LA**PS-8B-13-161 EasyMed-ID: Private, Secure, and Memorable Identification of Medical Record Data for Mobile Devices**T. STOKES¹, R. MOFFITT², S. HANG³, C-W. CHENG³, AND M. WANG⁴¹Emory University - Georgia Tech, Atlanta, GA, ²Georgia Tech - Emory University, Atlanta, GA, ³Georgia Tech, Atlanta, GA, ⁴Georgia Tech - Emory University, Atlanta, GA, Afghanistan**PS-8B-13-162 24-Hour Core Temperature in Obese and Lean Men and Women**R. A. LINSENMEIER¹, M. HOFFMANN¹, S. RODRIGUEZ², D. ZEISS², R. KUSHNER², AND L. LANDSBERG²¹Northwestern University, Evanston, IL, ²Northwestern University, Chicago, IL**PS-8B-13-163 Synergistic Effects of Conditioned Media and Hydrostatic Pressure on Stem Cell Differentiation**S. MAXSON¹, AND K. BURG¹¹Clemson University, Clemson, SC**PS-8B-13-164 A Coupled Agents –Transport Modelling Approach for Bioreactor Design**H. KAUL¹, D. J. HUGHES², Z. CUI¹, AND Y. VENTIKOS¹¹University of Oxford, Oxford, United Kingdom, ²Zyoxel Limited, Oxford, United Kingdom**PS-8B-13-165 Development of Solar Powered Transportable Mini-Lab for Field Disease Detection**E. RIOS¹, R. ESPINOZA¹, L. HOLGUIN¹, D. TERREROS², AND T. XU^{1,2}¹University of Texas at El Paso, El Paso, TX, ²Texas 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 Lubrication**L. SHI¹, AND A. STRIOLO¹¹The University of Oklahoma, Norman, OK**PS-8B-14-167 Investigation of Biaxial Periosteal Mechanics**O. O. ARUWAJOYE¹, AND P. B. WELLS²¹Texas Scottish Rite Hospital, Dallas, TX, ²Baylor University, Waco, TX**PS-8B-14-168 Biomechanical Analysis of the Rabbit Temporomandibular Joint Fibrocartilages**A. J. ALMARZA¹, AND S. E. HENDERSON¹¹University of Pittsburgh, Pittsburgh, PA**PS-8B-14-169 Incomplete Fibers in Inner Annulus Affects Tissue Stresses Higher than in Outer or Middle Annulus**M. HUSSAIN¹, R. E. GAY², AND K-N. AN³¹Logan University, Chesterfield, MO, ²Mayo Clinic, Rochester, MN, ³Mayo Clinics, Rochester, MN**PS-8B-14-170 Disc with Incomplete Fibers Bulges More than the Disc with Complete Fibers: A Finite Element Study**M. HUSSAIN¹, R. E. GAY², AND K-N. AN³¹Logan University, Chesterfield, MO, ²Mayo Clinic, Rochester, MN, ³Mayo Clinics, Rochester, MN**PS-8B-14-171 Characterization of Synthetic Ballistic Gelatin as an Achievable Biological Tissue Simulant**F. AMAECHI¹, AND J. L. SPARKS^{2,3}¹Wake Forest University School of Medicine, Winston Salem, ²⁷¹⁵⁷, ²Virginia Tech-Wake Forest Center for Injury Biomechanics, Winston Salem, ²⁷¹⁵⁷, ³Virginia 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 Collagen**S. SAHA¹, T. THORNTON¹, AND S. BATRA²¹SUNY Downstate Medical Center, Brooklyn, NY, ²CollaFirm, LLC, Monmouth Junction, NJ

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

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

P. J. BROWN¹, H. TAN¹, R. A. KRAFT¹, AND J. D. STITZEL¹
¹VT-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

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

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

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

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

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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

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

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

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

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

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

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

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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 I Diabetes

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

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

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

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

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

C. F. QUO¹, R. A. MOFFITT¹, A. H. MERRILL¹, AND M. D. WANG¹
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PS-8B-16-193 An Efficient Approach for the Combinatorial Quantitation and Control of Cellular Functions

I. AL-SHYOUKH¹, F. YU¹, J. FENG¹, S. DUBINETT¹, C-M. HO¹, J. S. SHAMMA², AND R. SUN¹
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PS-8B-16-194 Mathematical Model Predicts Master-regulatory Role of Hematopoietic Stem Cell Network Module

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

D. W. HENSLEY¹, AND K. R. DILLER¹
¹University of Texas at Austin, Austin, TX

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

P. THOMAS¹, A. PAZ¹, O. CINQUIN¹, AND E. HUI¹
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PS-8B-16-197 Modeling Inflammation with an Ensemble of Stochastic CellsJ. D. SCHEFF¹, S. E. CALVANO², S. F. LOWRY², AND I. P. ANDROULAKIS¹¹Rutgers University, Piscataway, NJ, ²UMDNJ-Robert Wood Johnson Medical School, New Brunswick, NJ**PS-8B-16-198** Metrics for Systems Biology Model Building and ComparisonC. KADDI¹, C. QUO¹, AND M. D. WANG^{1,2}¹Georgia Institute of Technology, Atlanta, GA, ²Emory University, Atlanta, GA**PS-8B-16-199** A Mathematical Model of Random Behavior of Micro-Objects Propelled by Attached BacteriaM. A. TRAORE¹, AND B. BEHKAM¹¹Virginia Tech, Blacksburg, VA**PS-8B-16-200** Identification of Critical Network Interactions by Pathway-Centered Analysis of Microarray DataJ. HOOD¹, AND R. R. VALLABHAJOSYULA¹¹CFD Research Corp, Huntsville, AL**PS-8B-16-201** WebPK: A Web-Based Application for Custom Pharmacokinetic SimulationsJ. SRIMANI¹, R. MOFFITT¹, AND M. D. WANG¹¹Georgia 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. LI¹, N. LAI¹, J. KIRWAN², AND S. GERALD¹¹Case Western Reserve University, Cleveland, OH, ²Cleveland Clinic, Cleveland, OH**PS-8B-17-203** Tailoring Electrospun Scaffolds for Use in Aortic Aneurysm RepairJ. MASSEY^{1,2}, M. AGRAWAL¹, AND S. BAILEY²¹University of Texas at San Antonio, San Antonio, TX, ²University 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. WRAY¹, AND D. L. KAPLAN¹¹Tufts University, Medford, MA**PS-8B-17-205** Protein Solubilization for Antigen Removal from Bovine Pericardium in Heart Valve Tissue EngineeringM. L. WONG¹, AND L. G. GRIFFITHS¹¹University of California, Davis, Davis, CA**PS-8B-17-206** Three Dimensionally Flocculated Proangiogenic Microgels for NeovascularizationR. J. DEVOLDER¹, AND H. KONG¹¹University of Illinois, Urbana, IL**PS-8B-17-207** Normalization of Microvascular Physiology by Cyclic AMP in Engineered Human Blood MicrovesselsK. WONG¹, J. TRUSLOW¹, AND J. TIEN¹¹Boston University, Boston, MA**PS-8B-17-208** The Controlled Release of Neuropeptide Induces AngiogenesisH. KOHARA¹, M. YAMAMOTO¹, AND Y. TABATA¹¹Institute for Frontier Medical Sciences, Kyoto University, Kyoto, Kyoto, Japan**PS-8B-17-209** Engineering Functional Human Microvessels *In Vitro*J. TIEN¹¹Boston University, Boston, MA**PS-8B-17-210** Hair Follicle Derived Mesenchymal Stem Cells for Engineering Arterial SubstitutesH. PENG¹, E. SCHLAICH¹, D. D. SWARTZ¹, AND S. T. ANDREADIS^{1,2}¹University at Buffalo, Buffalo, NY, ²New York State Center of Excellence, Buffalo, NY**PS-8B-17-211** Development of Bioactive Nanofibrous Vascular Grafts with *In-Vivo* Endothelialization PotentialJ. HENRY¹, AND S. LI¹¹University of California - Berkeley, Berkeley, CA**PS-8B-17-212** Vascular Cell Morphology on Aligned Collagen MatricesN. F. HUANG¹, T. S. ZAITSEVA², M. PAUKSHTO², J. SUN¹, G. G. FULLER¹, AND J. P. COOKE¹¹Stanford University, Stanford, CA, ²Fibralign Corp., Sunnyvale, CA**PS-8B-17-213** Reinforcing PEG Hydrogels with an Electrospun Mesh Sleeve to Form a Multilayer TEVGM. B. BROWNING¹, D. K. DEMPSEY¹, AND E. M. COSGRIFF-HERNANDEZ¹¹Texas A&M University, College Station, TX**PS-8B-17-214** Molecular Modulation of Endothelial Cell Adhesion for Vascular Tissue EngineeringB. J. TEFFT¹, A. M. KOPACZ¹, W. K. LIU¹, AND S. Q. LIU¹¹Northwestern University, Evanston, IL**PS-8B-17-215** *In Vitro* Biodegradation of a Novel Bioresorbable Poly(ester urethane)D. K. DEMPSEY¹, A. F. HAQUE¹, R. S. WARD², A. V. IYER², J. P. PARAKKA², AND E. M. COSGRIFF-HERNANDEZ¹¹Texas A&M University, College Station, TX, ²DSM-PTG, Berkeley, CA**PS-8B-17-216** Crosslinked Urethane-doped Polyester Triphasic Scaffold for Vascular Tissue EngineeringI. QATTAN¹, R. T. TRAN¹, AND J. YANG¹¹The University of Texas at Arlington, Arlington, TX**PS-8B-17-217** Mitral Valve Geometry Difference Between Ischemic and Dilated Condition During SystoleB. GAO¹, AND Z. HE¹¹Texas 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^{1,2}, D. L. MORALES^{2,3}, J. E. BARZILLA¹, AND K. J. GRANDE-ALLEN¹¹Rice University, Houston, TX, ²Baylor College of Medicine, Houston, TX, ³Texas Children's Hospital, Houston, TX**PS-8B-17-219** Dextran Stabilizes Engineered Human Microvessels *In Vitro*A. D. LEUNG¹, K. H. WONG¹, AND J. TIEN¹¹Boston University, Boston, MA**PS-8B-17-220** Enhanced Endothelialization Using EPC Autoseeding on POC/PLGA Microparticle CompositeH. XU¹, AND K. T. NGUYEN¹¹University of Texas at Arlington, Arlington, TX**PS-8B-17-221** Tailoring *In Vivo* Vascular Morphology with Bioactive Poly(ethylene glycol) HydrogelsJ. E. SAIK¹, D. J. GOULD^{1,2}, M. E. DICKINSON², AND J. L. WEST¹¹Rice University, Houston, TX, ²Baylor College of Medicine, Houston, TX**PS-8B-17-222** Methodology for the Fabrication of Cell Based Cardiac PumpsR. EVERS¹, AND R. BIRLA¹¹University of Michigan, Ann Arbor, MI**PS-8B-17-223** Cellular Assembly by Centrifugal Force to Form Tubular Tissue ConstructsC. JONES¹, E. J. BURFORD¹, L. SODERBOM¹, P. SULLIVAN¹, AND M. W. ROLLE¹¹Worcester Polytechnic Institute, Worcester, MA

PS-8B-17-224 A Porous Nylon Anchor System for Improved Culture of Cell-Derived Tissue TubesA. Z. REIDINGER¹, A. ORTIZ¹, AND M. W. ROLLE¹
¹Worcester Polytechnic Institute, Worcester, MA**PS-8B-17-225** Development of the Human Umbilical Artery as a 3D Scaffold for Vascular ReconstructionM. RODRIGUEZ¹, M. MCCLENDON¹, AND P. MCFETRIDGE²
¹University of Oklahoma, Norman, OK, ²University of Florida, Gainesville, FL**PS-8B-17-226** Multi-functional Nanofiber Patch to Tune Embryonic Stem Cell Delivery Onto Hypertrophic MyocardiumM. K. GUPTA¹, D. K. JUNG¹, A. K. HATZOPOULOS², AND H. J. SUNG¹
¹Vanderbilt University, Nashville, TN, ²Vanderbilt University Medical Center, Nashville, TN**PS-8B-17-227** Cell-Derived Ring Fusion to Generate Tubular Tissue ConstructsT. GWYTHYER¹, AND M. W. ROLLE¹
¹Worcester 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. BANIK¹, AND J. A. COOPER¹
¹Rensselaer Polytechnic Institute, Troy, NY**PS-8B-17-230** Control of Tissue Engineered Cardiac Muscle Fibrosis by an Endocardial SurrogateA. PARKAR¹, N. MASOUMI¹, A. JEAN¹, AND G. C. ENGELMAYR¹
¹The Pennsylvania State University, University Park, PA**PS-8B-17-231** Tailoring Electrospinning Fabrication for Scaffolds for Heart Valve Tissue EngineeringN. J. AMOROSO^{1,2}, A. D'AMORE^{1,3}, W. R. WAGNER^{1,2}, AND M. S. SACKS^{1,2}
¹University of Pittsburgh, Pittsburgh, PA, ²McGowan Institute for Regenerative Medicine, Pittsburgh, PA, ³University of Palermo, Palermo, Sicily, Italy**PS-8B-17-232** Macrophage Interactions with Decellularized Materials: Influence of Crosslinking TreatmentJ. MCDADE¹, M. ARIGANELLO¹, E. BRENNAN¹, R. LABOW², AND M. LEE¹
¹Dalhousie University, Halifax, NS, Canada, ²Ottawa Heart Institute, Ottawa, ON, Canada**PS-8B-17-233** A Hybrid, Tissue Engineered Leaflet for Bioprosthetic Heart ValvesH. ALAVI¹, R. L. GOODWIN¹, AND A. KHERADVAR¹
¹University 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. STOPPEL¹, J. C. WHITE¹, S. R. BHATIA¹, AND S. C. ROBERTS¹
¹University of Massachusetts Amherst, Amherst, MA**PS-8B-18-235** Canceled**PS-8B-18-236** Investigating Schwann Cell Response on Polypyrrole Substrates Upon Electrical StimulationL. FORCINITI¹, J. F. YBARRA¹, J. MALDONADO¹, AND C. E. SCHMIDT¹
¹University of Texas at Austin, Austin, TX**PS-8B-18-237** Stiffness of the Substrate Influences the Phenotype of Embryonic Chicken Cardiac MyocytesP. BAJAJ¹, X. TANG¹, T. SAIF¹, AND R. BASHIR¹
¹University of Illinois Urbana Champaign, Urbana, IL**PS-8B-18-238** Microtube Device Functionalized with Selectins for Capture and Study of Circulating Tumor CellsA. D. HUGHES¹, L. T. WESTERN², J. C. MATTISON¹, B. GREENE³, AND M. R. KING¹
¹Cornell University, Ithaca, NY, ²Rochester University, Rochester, NY, ³Biocytics Inc., Huntersville, NC**PS-8B-18-239** How Does ECM Fiber Stress State Affect Cell Behavior?M. A. KOTLARCHYK¹, S. SHREIM¹, E. KNIAZEVA¹, M. ALVAREZ-ELIZONDO¹, A. PUTNAM^{1,2}, AND E. BOTVINICK¹
¹UC Irvine, Irvine, CA, ²University of Michigan, Ann Arbor, MI**PS-8B-18-240** Harnessing Matrix Interface to Control Stem Cell DifferentiationR. AYALA¹, C. ZHANG¹, A. AUNG¹, Y. HWANG¹, AND S. VARGHESE¹
¹UC San Diego, La Jolla, CA**PS-8B-18-241** Designing Biomaterial Surfaces to Enhance Keratinocyte Adhesion at the Skin-Implant InterfaceC. M. TING¹, A. M. KHAING¹, W. G. MCGIMPSEY¹, AND G. D. PINS¹
¹Worcester Polytechnic Institute, Worcester, MA**PS-8B-18-242** Effects of Synthetic Biogel Scaffold Properties in Angiogenesis, Modeling with Agent Based SystemsA. ARTEL¹, H. MEHDIZADEH¹, E. BREY¹, AND A. CINAR¹
¹Illinois Institute of Technology, Chicago, IL**PS-8B-18-243** Development Of Biomimetic Materials For Guided Endothelial Cell Morphogenesis, and OrganizationA. PORTER¹, Y. YUAN¹, C. M. KLINGE¹, AND A. S. GOBIN¹
¹University of Louisville, Louisville, KY**PS-8B-18-244** Dynamic Bioactive Surfaces for Temporal Regulation of Extracellular MicroenvironmentsB. LIU¹, AND W. SHEN¹
¹University of Minnesota, Minneapolis, MN**PS-8B-18-245** Electrical Control of Cell Migration on a Conducting Polymer SurfaceA. GUMUS¹, J. CALIFANO¹, A. WAN¹, J. HUYNH¹, C. REINHART-KING¹, AND G. MALLIARAS¹
¹Cornell University, Ithaca, NY**PS-8B-18-246** Microcracking and Maturation of MC3T3-E1 Osteoblast BehaviorY. SHU¹, M. BAUMANN¹, L. MCCABE¹, E. CASE¹, AND R. IRWIN¹
¹Michigan State University, East Lansing, MI**PS-8B-18-247** Tryptophan: An Intrinsic Fluororeporter for Peptide Functionalized BiomaterialsS. N. MASAND¹, A. BLAZIER², C. BRADLEY¹, AND D. SHREIBER¹
¹Rutgers, The State University of New Jersey, Piscataway, NJ, ²University of Virginia, Charlottesville, VA**PS-8B-18-248** Pro- and Anti-Oxidative Biomaterial Surfaces to Modulate Stem Cell FateS. W. CROWDER¹, A. L. ZACHMAN¹, M. K. GUPTA¹, E. LIU², J. B. KOHN², P. V. MOGHE², AND H.-J. SUNG¹
¹Vanderbilt University, Nashville, TN, ²Rutgers University, Piscataway, NJ**PS-8B-18-249** Cell Interactions in Biomimetic Apatite MicroenvironmentE. TSANG¹, C. ARAKAWA¹, P. ZUK², AND B. WU¹
¹Dept of Bioengineering, UCLA, Los Angeles, CA, ²Dept 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. DECOTEAU¹, L. ZHANG¹, R. M. STEFANI¹, R. A. HOPKINS², AND E. MATHIOWITZ¹
¹Brown University, Providence, RI, ²The Children's Mercy Hospital, Kansas City, MO**PS-8B-19-251** Nitric Oxide Releasing Polymers as Bone Metabolism Support in Tissue Engineering ScaffoldsJ. FORREST¹, G. E. GIERKE¹, M. J. VANWAGNER¹, K. L. SNYDER¹, M. C. FROST¹, AND R. M. RAJACHAR¹¹Michigan Technological University, Houghton, MI**PS-8B-19-252** Multiple Drug Delivery System Based on CAP-Pluronic Association PolymerS. SUNDARARAJ¹, D. PULEO¹, AND M. THOMAS¹¹University of Kentucky, Lexington, KY**PS-8B-19-253** Preparation and Characterization of NSAID-embedded Nanofiber Matrix for Drug DeliveryP. SAMUEL¹, AND J. A. COOPER¹¹Rensselaer 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. WILSON¹, N. KOTA¹, Y. KIM¹, D. B. STOLZ², Y. WANG², O. B. OZDOGANLAR¹, AND P. R. LEDUC¹¹Carnegie Mellon University, Pittsburgh, PA, ²University of Pittsburgh, Pittsburgh, PA**PS-8B-20-255** High-Speed Biaxial Tissue Testing of Abdominal VisceraN. A. WHITE¹, M. K. HOWES¹, AND W. N. HARDY¹¹Virginia Tech, Blacksburg, VA**PS-8B-20-256** Temperature-controlled Harvesting of Cell AggregatesH. TEKIN^{1,2}, C. NAUMAN^{2,3}, M. ANAYA^{2,4}, R. LANGER^{4,5}, AND A. KHADEMHOSEINI^{2,5}¹Department of Electrical Engineering and Computer Science, Massachusetts Institute of Technology, Cambridge, MA, ²Center for Biomedical Engineering, Brigham and Women's Hospital, Harvard Medical School, Cambridge, MA, ³Department of Biology, Massachusetts Institute of Technology, Cambridge, MA, ⁴Department Chemical Engineering, Massachusetts Institute of Technology, Cambridge, MA, ⁵Harvard-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. ZHENG¹, P. W. HENDERSON², N. W. CHOI¹, L. J. BONASSAR¹, J. A. SPECTOR², AND A. D. STROOCK¹¹Cornell University, Ithaca, NY, ²Weill Cornell Medical College, New York, NY**PS-8B-20-258** Isolation and Purification of Novel Organic Nanoparticles from English Ivy (*Hedera helix*)S. LENAGHAN¹, L. XIA¹, W. HENSON¹, AND M. ZHANG¹¹University of Tennessee, Knoxville, TN**PS-8B-20-259** A Microstructure Based Mechanical Model for Planar Fibrous ScaffoldsA. D'AMORE^{1,2}, C. M. HOBSON¹, W. R. WAGNER¹, AND M. S. SACKS¹¹University of Pittsburgh, Pittsburgh, PA, ²University of Palermo, Palermo, Italy, Italy**PS-8B-20-260** Engineering Optimal Islets for Transplantation for Type 1 DiabetesK. RAMACHANDRAN¹, S. J. WILLIAMS¹, H-H. HUANG¹, C. BERKLAND², AND L. STEHNO-BITTEL¹¹University of Kansas Medical Center, Kansas City, KS, ²University of Kansas, Lawrence, KS**PS-8B-20-261** Tri-functional Nanoporous Silica Nanoparticles for Imaging, Delivery and Biomaterial ReinforcementC. SMID¹¹University 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. KEMPER¹, A. SANTAGO¹, J. STITZEL¹, J. SPARKS¹, AND S. DUMA¹¹Virginia 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. CASTILLO¹, AND S. N. HOSMANE¹¹Johns Hopkins University, Baltimore, MD**PS-8B-20-264** Nano-Patterned Surfaces Induce Elastin Expression from Valvular Interstitial CellsE. L. HEDBERG-DIRK¹, U. A. MARTINEZ¹, AND A. E. HELLEBUST¹¹University of New Mexico, Albuquerque, NM**PS-8B-20-265** Characterization of Small Diameter *In Vitro* Endothelial Linings of the MicrovasculatureM. B. ESCH¹, M. L. SHULER¹, AND T. STOKOL¹¹Cornell University, Ithaca, NY**PS-8B-20-266** Photopatterning of Cell-laden PEGDA Hydrogel Microstructures Using Mask Projection PhotolithographyS. J. HIGBEE¹, M. P. CUCHIARA¹, AND J. L. WEST¹¹Rice University, Houston, TX**PS-8B-20-267** Step Based Isodiametric Design Space for Aligned Deposition of Polymer Nanofibers in Multiple LayersJ. WANG¹, AND A. S. NAIN¹¹Virginia Tech, Blacksburg, VA**PS-8B-20-268** Dynamic Material Properties of Pregnant Human UterusS. DUMA¹, S. MANOOGIAN¹, J. BISPLINGHOFF¹, AND J. STITZEL¹¹Virginia 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. TURNER¹, J. LUNA¹, M. KHINE², AND K. MCCLOSKEY¹¹University of California - Merced, Merced, CA, ²University of California - Irvine, Irvine, CA**PS-8B-20-270** Patented Electrospinning Process (EsNT) for NanoMedicineG-M. KIM¹, J. D. SALAZAR¹, L. MUERZA-CASCANTE¹, A. ELÓSEGUI¹, AND E. DE JUAN-PARDO¹¹CEIT 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. TIEN¹, E. S. GIL¹, S. H. PARK¹, B. B. MANDAL¹, AND D. L. KAPLAN¹¹Tufts University, Medford, MA**PS-8B-21-272** Patterning of Poly-Caprolactone (PCL) Nanofibers using Near Field ElectrospinningB. STARLY¹, AND S-F. LAN¹¹University of Oklahoma, Norman, OK**PS-8B-21-273** Anatomically Precise 3D Printing for Engineering Spatially Heterogeneous Living Heart ValvesL. A. HOCKADAY¹, K. H. KANG¹, N. W. COLANGELO¹, P. Y-C. CHEUNG¹, J. WU¹, H. LIPSON¹, C-C. CHU¹, AND J. T. BUTCHER¹¹Cornell University, Ithaca, NY

PS-8B-21-274 Microfluidics in Hydrogels Using a Sealing Adhesion Layer

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PS-8B-21-275 Surface Immobilization of Adeno-Associated Virus for Localized Gene Delivery

K. I. MCCONNELL¹, J. H. SLATER¹, R. W. ADAMS¹, J. L. WEST¹, S. L. BISWAL¹, AND J. SUH¹
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PS-8B-21-276 Vasculature Patterning within Hydrogel using Three-Dimensional Bio-Printing Technology

V. K. LEE¹, W. LEE², S-S. YOO³, AND G. DAI¹
¹RPI, Troy, NY, ²KAIST, Daejeon, Korea, Republic of, ³Brigham 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 Structures

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¹California Institute of Technology, Pasadena, CA, ²The David Geffen School of Medicine at UCLA, Los Angeles, CA

PS-8B-21-278 Hydrogel Tubular Constructs Formed Via a Multiphase Co-axial Flow

M. HU¹, R. DENG¹, L. WANG¹, M. KURISAWA¹, AND J. YING¹
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PS-8B-21-279 Development of Miniature Drug Screening Platform Utilizing Low Cost Bioprinting Technology

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PS-8B-21-280 Hierarchical Silk Laminates for Tissue Formation

B. B. MANDAL¹, AND D. L. KAPLAN¹
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PS-8B-21-281 Spatial Control of Cell Differentiation Fate Using Oriented Sub-micron Fibers and Bioprinted Growth Factors

D. KER¹, A. NAIN², J. SUHAN¹, B. CHU¹, L. WEISS¹, AND P. CAMPBELL¹
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PS-8B-21-282 HUVEC Networks Printed to Stackable PLGA/Hydrogel 'Biopapers' via BioLP

R. K. PIRLO¹, P. K-C. WU², AND B. RINGEISEN¹
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PS-8B-21-283 Non-Contact Printing of High-Fidelity Heterocellular Niches Using Aqueous Biphasic Systems

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¹University of Michigan, Ann Arbor, MI

PS-8B-21-284 Three-Dimensional (3D) Stereo-Lithographic Technology for Bio-inspired Multi-Cellular Structures

V. CHAN¹, P. ZORLUTUNA¹, J. JEONG¹, H. KONG¹, AND R. BASHIR¹
¹University of Illinois, Urbana-Champaign, Urbana, IL

PS-8B-21-285 High Throughput Miniaturization of Artificial Cells Using Inkjet Technology

M. MOBED-MIREMADI¹, E. ACKS¹, S. POLSAWARD¹, AND D. CHEN¹
¹San Jose State University, San Jose, CA

PS-8B-21-286 Topographic and Chemically Micropatterned Polyacrylamide Cell Substrates

M. J. POELLMANN¹, P. A. HARRELL¹, S. MISHRA¹, K. A. BARTON¹, W. P. KING¹, AND A. J. WAGONER JOHNSON¹
¹University of Illinois at Urbana Champaign, Urbana, IL

PS-8B-21-287 Micropatterning and Printing of Functional Microscale Tissue Subunits on Nanofibrous Scaffolds

D. GALLEGOS-PEREZ¹, N. HIGUITA-CASTRO¹, J. LANNUTTI¹, K. GOOCH¹, AND D. HANSFORD¹
¹The Ohio State University, Columbus, OH

PS-8B-21-288 Improving Cell Viability Using Bio-printed Oxygen Particles for Tissue Engineering Application

A. ARTEAGA¹, AND T. XU^{1,2}
¹University of Texas at El Paso, El Paso, TX, ²Texas 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. PACE¹, J. BARNWELL¹, Z. LI¹, L. A. KOMAN¹, T. A. SMITH¹, AND M. VAN DYKE¹¹Wake Forest University School of Medicine, Winston Salem, NC**2:45PM OP-8-2-1D** Commercializing the Avance[®] Nerve GraftC. DEISTER¹¹AxoGen, 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 VEN¹, S. LEE², P. KIM³, O. HALEY³, S-H. YUN³, M. FERRARI¹, AND P. DECUZZI¹¹University of Texas Health Science Center, Houston, TX, ²University of Texas, Austin, TX, ³Harvard Medical School, Boston, MA**1:45PM OP-8-2-2B** Targeted Microwave Hyperthermia Using Magnetite NanoparticlesJ. R. COOK¹, S. KIM¹, J. A. PEARCE¹, AND S. Y. EMELIANOV¹¹University 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. ZIMMERMANN¹, J. ZHANG¹, H. DORN¹, C. G. RYLANDER¹, AND M. N. RYLANDER¹¹Virginia 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^{1,2}, C. PURON^{1,3}, A. B. RAMOS^{1,3}, A. GROOTHUIS⁴, G. SAHAGIAN⁵, AND E. EDELMAN^{1,6}¹MIT, Cambridge, MA, ²Brigham and Women Hospital, Harvard Medical School, Boston, MA, ³Institut Quimic de Sarria, Barcelona, Spain, Spain, ⁴CBSET, Concord, MA, ⁵Tufts University School of Medicine, Boston, MA, ⁶Brigham and Women's Hospital, Harvard Medical School, Boston, MA**2:30PM OP-8-2-2E** Irreversible Electroporation Treatment Planning TechniquesR. E. NEAL¹, P. A. GARCIA¹, J. H. ROSSMEISL², AND R. V. DAVALOS¹¹Virginia Tech - Wake Forest School of Biomedical Engineering and Sciences, Blacksburg, VA, ²Virginia - Maryland Regional College of Veterinary Medicine, Blacksburg, VA**2:45PM OP-8-2-2F** Multifractal and Lacunarity Analysis of MicrovasculatureD. J. GOULD^{1,2}, T. J. VADAKKAN², AND M. E. DICKINSON^{1,2}¹Rice University, Houston, TX, ²Baylor 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. MUTYAL¹, V. TURZHITSKY¹, J. ROGERS¹, A. RADOSEVICH¹, H. ROY², M. GOLDBERG², M. JAMEEL², A. BOGOJEVICH², AND V. BACKMAN¹¹Northwestern University, Evanston, IL, ²Northshore University Healthsystems, Evanston, IL**1:45PM OP-8-2-3B** Simultaneous Imaging of Blood Flow, Hemoglobin Concentration, and Absolute PO₂ *In Vivo* During Stroke Using a Digital Micromirror DeviceA. PONTITCORVO¹, M. A. DAVIS¹, AND A. K. DUNN¹¹University 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. DATTA¹, S. LIU¹, G. MURALIDHAR¹, A. S. PARANJAPÉ¹, B. ELMAANAOU¹, J. DEWELLE¹, T. E. MILNER¹, H. G. RYLANDER III¹, AND M. K. MARKEY¹¹The University of Texas at Austin, Austin, TX**2:15PM OP-8-2-3D** Enhancing Video Capsule Endoscopy: Location and Bleeding DetectionD. L-P. YEUNG¹, A. SABET¹, Y. INOUE¹, AND J. M. YAP¹¹University of Michigan, Ann Arbor, MI**2:30PM OP-8-2-3E** Image Mapping Spectrometer for Real Time Hyperspectral Imaging of Living CellsL. GAO¹, R. T. KESTER¹, N. BEDARD¹, N. HAGEN¹, AND T. S. TKACZYK¹¹Rice 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. MUFTI¹, Y. KONG², J. D. CIRILLO², AND K. C. MAITLAND¹¹Texas A&M University, College Station, TX, ²Texas 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^{1,2}, N. WETTELS^{1,2}, C. H. LIN^{1,2}, Z. SU¹, AND G. E. LOEB^{1,2}¹University of Southern California, Los Angeles, CA, ²SynTouch, LLC, Los Angeles, CA**1:45PM OP-8-2-4B** Restoring Sensorimotor Function with Utah Slanted Electrode Arrays in Peripheral NervesG. A. CLARK¹, N. M. LEDBETTER¹, D. J. WARREN¹, A. M. WILDER¹, B. R. DOWDEN¹, M. A. FRANKEL¹, C. ETHIER², E. R. OBY², L. E. MILLER², F. SOLZBACHER¹, R. R. HARRISON¹, AND R. A. NORMANN¹¹University of Utah, Salt Lake City, UT, ²Northwestern 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. MARASCO¹, A. E. SCHULTZ², K. KIM³, J. E. COLGATE⁴, M. A. PESHKIN⁴, AND T. A. KUIKEN²¹Louis Stokes Cleveland Department of Veterans Affairs Medical Center, Cleveland, OH, ²Rehabilitation Institute of Chicago, Chicago, IL, ³Korea Institute of Science and Technology, Seoul, Korea, Republic of, ⁴Northwestern University, Evanston, IL

2:15PM OP-8-2-4D Electrical Stimulation of Degenerated Retina with High Resolution ElectrodeJ. WEILAND^{1,2}, L. CHAN¹, A. RAY¹, AND M. HUMAYUN^{1,2}¹University of Southern California, Los Angeles, CA, ²Doheny Eye Institute, Los Angeles, CA**2:30PM OP-8-2-4E** Solutions to Problem of Electrode Channel Interaction in a Vestibular ProsthesisG. Y. FRIDMAN¹, C. DAI¹, N. S. DAVIDOVICS¹, B. CHIANG¹, AND C. C. DELLA SANTINA¹¹Johns Hopkins University, Baltimore, MD**2:45PM OP-8-2-4F** New Directions in Deep Brain Stimulation (DBS) for Hearing Restoration and Tinnitus SuppressionH. H. LIM¹, M. LENARZ², AND T. LENARZ²¹University of Minnesota, Minneapolis, MN, ²Hannover 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. PERRY¹, AND R. MALKIN¹¹Duke University, Durham, NC**1:45PM OP-8-2-5B** Early Experiences Implementing a Low Resource Settings BME Curriculum at the US-Mexico borderT. BOLAND¹¹University of Texas at El Paso, El Paso, TX**2:00PM OP-8-2-5C** Collaboration for Healthcare in Developing CountriesA. L. LERNER¹, S. H. SEIDMAN¹, B. CASTANEDA², AND W. CARRERA²¹University of Rochester, Rochester, NY, ²Pontificia 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. BUTLER¹, AND K. MEHTA¹¹Penn State University, University Park, PA**2:30PM OP-8-2-5E** Design of a Dental Chair for Rural Communities: An International CollaborationG. M. RUIZ SOTO¹, AND A. LOUIE²¹ITESM, Monterrey, Nuevo Leon, Mexico, ²University of California, Davis, CA**2:45PM OP-8-2-5F** X-Ray Development TimerA. F. BRITT¹, AND P. G. ANDERSON²¹Duke, Winnetka, IL, ²Duke 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. SHEBANOVA¹¹University of Pennsylvania, Philadelphia, PA**1:45PM OP-8-2-6B** Vinculin Modulates Cell Adhesion Strength in Response to Fibronectin DensityD. W. DUMBAULD¹, S. W. CRAIG², AND A. J. GARCIA¹¹Georgia Institute of Technology, Atlanta, GA, ²The 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. GU¹, J. MCGINTY², A. VENKATESH¹, M. PATE², AND F. BENENCIA^{1,2}¹Russ College of Engineering, Ohio University, Athens, OH, ²OUCOM, Ohio University, Athens, OH**2:15PM OP-8-2-6D** Structural Elastic Memory of Immune Synapse CytoskeletonE. TABDANOV¹, E. JUDOKUSUMO¹, AND L. C. KAM¹¹Columbia 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. LEE¹, J. KIM¹, G. T. KORETZKY¹, AND D. A. HAMMER¹¹University of Pennsylvania, Philadelphia, PA**2:45PM OP-8-2-6F** Characterization of HNSCC Ligand and Endothelium Receptor InteractionsJ. MARSHALL¹, S. M. WOOD¹, C. ABRAM¹, L. NIMRICHTER², AND M. M. BURDICK¹¹Ohio University, Athens, OH, ²Universidade 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. CLARK¹, AND P. F. DAVIES¹¹University of Pennsylvania, Philadelphia, PA**1:45PM OP-8-2-7B** Endothelial Gene Connectivity Network Analysis Identifies Distinct Coronary Artery PhenotypesM. CIVELEK¹, E. MANDUCHI², R. J. RILEY², C. J. STOECKERT JR², AND P. F. DAVIES²¹University of California, Los Angeles, Los Angeles, CA, ²University of Pennsylvania, Philadelphia, PA**2:00PM OP-8-2-7C** Quantitative Mechanical Tests of Mouse Atherosclerotic Plaque StabilityY. WANG^{1,2}, J. NING¹, M. A. SUTTON¹, AND S. M. LESSNER^{1,2}¹University of South Carolina, Columbia, SC, ²University of South Carolina, School of Medicine, Columbia, SC**2:15PM OP-8-2-7D** Rapid Remodeling of Cardiovascular Tissues During PregnancyS. WELLS¹, D. DEBAY¹, A. MOELLER¹, C. PIERLOT¹, J. DOANE¹, AND M. LEE¹¹Dalhousie University, Halifax, NS, Canada**2:30PM OP-8-2-7E** Hyperglycemia Reduces Nitric Oxide, Increases Nitrotyrosine and Apoptosis in Endothelial CellS. C. ROGERS¹, AND M. KAVDIA¹¹University of Arkansas, Fayetteville, AR**2:45PM OP-8-2-7F** Histamine Induces Monocyte Interactions with Arterial Endothelium *In Vitro*C. CHEN¹, AND D. B. KHISMATULLIN¹¹Tulane 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. ELLWEIN¹, H. OTAKE², B-K. KOO³, T. SHINKE⁴, Y. HONDA², J. SHITE⁴, AND J. F. LADISA¹¹Marquette University, Milwaukee, WI, ²Stanford University, Stanford, CA, ³Seoul National University College of Medicine, Seoul, Korea, Republic of, ⁴Kobe 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. CARRUTHERS¹, C. M. ALFIERI², E. M. JOYCE¹, K. E. YUTZEY², AND M. S. SACKS¹¹University of Pittsburgh, Pittsburgh, PA, ²Cincinnati 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. EINSTEIN¹, F. DEL PIN², J-P. RABBAH³, S. R. IDELSOHN⁴, A. P. KUPRAT¹, X. JIAO⁵, J. P. CARSON¹, A. P. YOGANATHAN³, AND K. S. KUNZELMAN⁶¹Pacific Northwest National Laboratory, Richland, WA, ²Livermore Software Technology Corp, Livermore, CA, ³Georgia Tech, Atlanta, GA, ⁴International Center for Numerical Methods in Engineering (CIMNE), Barcelona, Spain, ⁵Stony Brook University, Stony Brook, NY, ⁶University of Maine, Lewiston, ME**2:15PM OP-8-2-8D** Multi-modality Experimental Platform for Validation of Dynamic Mitral Valve Computation ModelsJ-P. RABBAH¹, N. SAIKRISHNAN¹, AND A. P. YOGANATHAN¹¹Georgia Institute of Technology, Atlanta, GA**2:30PM OP-8-2-8E** Predicted Arterial Changes during Hypertension using Multi-Scale ModelingH. N. HAYENGA¹, B. C. THORNE², S. M. PEIRCE², AND J. D. HUMPHREY¹¹Texas A&M University, College Station, TX, ²University of Virginia, Charlottesville, VA**2:45PM OP-8-2-8F** Computational Evaluation of Mechanical Heart Valve Prosthesis Performance in Patient-Specific AnatomiesT. LE¹, I. BORAZJANI¹, AND F. SOTIROPOULOS¹¹University 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^{1,2}, A. S. KIZHAKKE PULIYAKOTE¹, T. M. EGGLESTON¹, AND E. A. HOFFMAN¹¹University of Iowa, Iowa City, IA, ²Philipp University, Marburg, Hessen, Germany**1:45PM OP-8-2-9B** - Effect of Lung Inflation on Canine Airway Dimensions In VivoD. CHON¹, B. A. SIMON^{1,2}, AND D. W. KACZKA^{1,2}¹Beth Israel Deaconess Medical Center, Boston, MA, ²Harvard Medical School, Boston, MA**2:00PM OP-8-2-9C** - Effects of Gas Properties on Regional Ventilation: Comparison between MDCT and MRI AssessmentsY. YIN¹, A. HALAWEISH¹, C-L. LIN¹, E. VAN BEEK¹, AND E. A. HOFFMAN¹¹The 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. WELLMAN¹, T. WINKLER², E. L. COSTA², R. S. HARRIS², G. MUSCH², J. G. VENEGAS², AND M. F. VIDAL MELO²¹Boston University, Boston, MA, ²Massachusetts 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^{1,2}, J. X. WANG^{1,3}, E. O'RIORDAN⁴, D. G. MCCORMACK⁵, AND G. PARRAGA^{1,2}¹Robarts Research Institute, London, Ontario, Canada, ²Biomedical Engineering, University of Western Ontario, London, Ontario, Canada, ³General Electric Healthcare CANADA, London, Ontario, Canada, ⁴Department of Medical Imaging, University of Western Ontario, London, Ontario, Canada, ⁵Division of Respiratory, University of Western Ontario, London, Ontario, Canada**2:45PM OP-8-2-9F** Automatic Segmentation of Ventilation Defects in Hyperpolarized 3He MRIN. J. TUSTISON¹, B. B. AVANTS¹, T. A. ALTES², E. E. DE LANGE², J. P. MUGLER², AND J. C. GEE¹¹University of Pennsylvania, Philadelphia, PA, ²University 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. DAI¹, X. GUAN¹, W. LI¹, D. NAKAMALIL¹, AND G. R. GAN¹¹University of Oklahoma, Norman, OK**1:45PM OP-8-2-10B** Dynamic Stability of Walking During Support Surface and Visual Field TranslationsP. M. MCANDREW¹, J. B. DINGWELL¹, AND J. M. WILKEN²¹University of Texas at Austin, Austin, TX, ²Center 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. FONTANA¹, AND A. W. CHIU¹¹Louisiana Tech University, Ruston, LA**2:15PM OP-8-2-10D** Effect of Endurance Exercise Training and Chronic Ethanol Ingestion on Skeletal Muscle in RatS. Iyer¹, M. Sackeli¹, C. Zappacosta¹, and Y. Gao¹¹Cornell University, Ithaca, NY**2:30PM OP-8-2-10E** Physical Activity Classification Utilizing Activity Monitors in Manual Wheelchair Users with SCIS. V. HIREMATH¹, AND D. DING¹¹University of Pittsburgh, Pittsburgh, PA**2:45PM OP-8-2-10F** The Effects of Computer Keyboarding on Median Nerve Ultrasound MeasuresK. TOOSI¹, AND M. BONINGER¹¹University 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. CHANG¹, AND W. OLBRICHT¹
¹Cornell University, Ithaca, NY

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

A. SHUKLA¹, R. C. SMITH¹, AND P. T. HAMMOND¹
¹Massachusetts Institute of Technology, Cambridge, MA

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

C. CHIAPPINI¹, J. FAKHOURY², X. LIU², E. TASCIOTTI², L. BROUSSEAU², AND M. FERRARI^{1,2}
¹The University of Texas at Austin, Austin, TX, ²The 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. CHAROENPHOL¹, AND O. ENIOLA-ADEFESO²
¹University of Michigan, Ann Arbor, MI, ²University of Michigan, Ann Arbor, MI

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

C. WALKER¹, AND W. CHAN¹
¹University of Toronto, Toronto, Ontario, Canada

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

M. L. GRAN¹, AND N. A. PEPPAS¹
¹University 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. CURTIS¹, E. BUDYN¹, T. DESAI², AND B. RUSSELL¹
¹University of Illinois at Chicago, Chicago, IL, ²University 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. HOLT¹, P. A. SHORT¹, K. N. DAHL¹, AND M. F. ISLAM¹
¹Carnegie 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. HUGHES¹, AND M. R. KING¹
¹Cornell University, Ithaca, NY

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

E. S. DAY¹, L. ZHANG², P. A. THOMPSON², N. A. LEWINSKI¹, N. AHMED², N. S. RIGGALL¹, R. A. DREZEK¹, S. M. BLANEY², AND J. L. WEST¹
¹Rice University, Houston, TX, ²Texas Children's Hospital, Houston, TX

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

A. J. COUGHLIN¹, A. M. GOBIN¹, J. J. MOON¹, AND J. L. WEST¹
¹Rice University, Houston, TX

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

Y.-P. HO¹, C. GRIGSBY¹, F. ZHAO¹, H. LI¹, AND K. W. LEONG¹
¹Duke 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. HEFFERNAN¹, J. W. SCHLOM¹, AND J. W. GREINER¹
¹National Cancer Institute, Bethesda, MD

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

M. BLACK¹, AND M. TIRRELL^{1,2}
¹University of California, Santa Barbara, CA, ²University of California, Berkeley, CA

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

W. LIU¹, J. R. MCDANIEL¹, X. LI¹, M. R. ZALUTSKY¹, AND A. CHILKOTI¹
¹Duke University, Durham, NC

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

N. QUATTROCCHI¹, C. CHIAPPINI², L. COOPER³, M. MASSERINI⁴, M. FERRARI¹, AND E. TASCIOTTI¹
¹The University of Texas Health Science Center at Houston, Houston, TX, ²The University of Texas at Austin, Austin, TX, ³The University of Texas M.D. Anderson Cancer Center, Houston, TX, ⁴Universita' Milano Bicocca, Monza, Milano, Italy

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

M. CHEN¹, J. MACKAY², J. MCDANIEL¹, W. LIU¹, T. CHU¹, A. SIMNICK¹, AND A. CHILKOTI¹
¹Duke University, Durham, NC, ²University of Southern California, Los Angeles, CA

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

O. Z. FISHER¹, R. LANGER¹, AND D. G. ANDERSON¹
¹MIT, 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. KASTURI¹, I. SKOUNTZOU¹, R. A. ALBRECHT², D. KOUTSONANOS¹, T. HUA¹, H. NAKAYA¹, R. RAVINDRAN¹, S. STEWART³, M. ALAM³, N. MURTHY⁴, J. STEEL², J. JACOB¹, R. J. HOGAN², A. GARCIA-SASTRE², R. COMPANS¹, AND B. PULENDRAN¹

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

1:45PM OP-8-2-14B Interbilayer-Crosslinked Multilamellar Vesicles for Antigen Delivery and Vaccine ApplicationsJ. J. MOON¹, H. SUH¹, M. SOHAIL¹, A. BERSHTEYN¹, A. YADAVA², AND D. J. IRVINE^{1,3}¹Massachusetts Institute of Technology, Cambridge, MA, ²Walter Reed Army Institute of Research, Silver Spring, MD, ³Howard Hughes Medical Institute, Chevy Chase, MD**2:00PM OP-8-2-14C** Simultaneous, Single-carrier Delivery of Antigens and Immune-modulatory siRNA to Dendritic CellsE. R. DAWSON¹, A. SINGH¹, T. VO¹, AND K. ROY¹¹The University of Texas at Austin, Austin, TX**2:15PM OP-8-2-14D** Lymphatic Drainage in Immunity: Implications in Lymph Node Targeting Strategies for ImmunomodulationS. N. THOMAS¹, J. RUTKOWSKI¹, AND M. A. SWARTZ¹¹Swiss 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 MiceO. A. ALI¹, D. EMERICH², G. DRANOFF³, AND D. J. MOONEY¹¹Harvard University, Cambridge, MA, ²Incyte, Inc, Lincoln, RI, ³Dana Farber Cancer Institute, Boston, MA**2:45PM OP-8-2-14F** Spatial Coordination of CD28 and CD3 Signaling in Mouse and Human LymphocytesK. BASHOUR¹, J. TSAI¹, K. SHEN^{1,2}, M. L. DUSTIN³, AND L. C. KAM¹¹Columbia University, New York, NY, ²Harvard University, Cambridge, MA, ³New 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 TissueC. L. MULVEY¹, P. J. AMOS¹, AND S. PEIRCE-COTTLER¹¹University of Virginia, Charlottesville, VA**1:45PM OP-8-2-15B** Myocyte-Depleted Engineered Cardiac Tissues Support Therapeutic Potential of Mesenchymal Stem CellsG. W. SERRAO¹, I. C. TURNBULL¹, D. ANCUKIEWICZ¹, Q. R. YOUMANS¹, L. HADRI¹, R. J. HAJJAR¹, AND K. D. COSTA¹¹Mount Sinai School of Medicine, New York, NY**2:00PM OP-8-2-15C** Amniotic Fluid-derived Stem Cell Culture on Poly(ethylene glycol) Diacrylate HydrogelsJ. J. PETSCHKE¹, B. GILL¹, M. ALIRU¹, J. L. WEST¹, AND J. G. JACOT^{1,2}¹Rice University, Houston, TX, ²Texas Children's Hospital, Houston, TX**2:15PM OP-8-2-15D** Viral Fusogens to Promote Stem Cell Reprogramming via FusionB. FREEMAN¹, AND B. OGLE¹¹University of Wisconsin-Madison, Madison, WI**2:30PM OP-8-2-15E** Highly Extensible Hydrogels Capable of Differentiating Mesenchymal Stem Cells Into CardiomyocytesZ. LI¹, AND J. GUAN²¹The Ohio State University, Columbus, OH, ²Ohio State University, Columbus, OH**2:45PM OP-8-2-15F** Relative Impact of Cell Shape Versus ECM Ligand Identity on MSC Lineage ProgressionP. QU¹, D. MUNOZ-PINTO¹, AND M. HAHN¹¹Texas 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 DevelopmentA. A. CHEN^{1,2}, L. ONG¹, AND S. N. BHATIA¹¹Massachusetts Institute of Technology, Cambridge, MA, ²Harvard University, Cambridge, MA**1:45PM OP-8-2-16B** Detoxification Profiles in Three-Dimensional (3D) Liver Mimetic Cellular ArchitecturesY. KIM¹, AND P. RAJAGOPALAN¹¹Virginia Polytechnic Institute and State University, Blacksburg, VA**2:00PM OP-8-2-16C** Engineering Microscale Liver Models for Drug DevelopmentA. MOORE¹, S. KRZYZEWSKI¹, J. GAFFNEY¹, S. MCLEAN¹, J. MCGEEHAN¹, AND S. KHETANI¹¹Hepregen Corporation, Medford, MA**2:15PM OP-8-2-16D** Quantifying the Extent and Kinetics of Self-Assembly and Self-Sorting in 3D Micro-tissuesT-M. FERRUCCIO¹, S. MCCALLA², A. TRIPATHI¹, AND J. MORGAN¹¹Brown University, Providence, RI, ²Brown University, Providence, RI**2:30PM OP-8-2-16E** A Novel *In Vitro* Microenvironment for Drug Delivery Particle ScreeningB. PRABHAKARPANDIAN¹, J. FEWELL², K. ANWER², AND K. PANT¹¹CFD Research Corporation, Huntsville, AL, ²EGEN Inc., Huntsville, AL**2:45PM OP-8-2-16F** The Development of a 3D Tissue Engineered Bone Tumor ModelE. BURDETT¹, A. G. MIKOS¹, F. K. KASPER¹, AND J. A. LUDWIG²¹Rice University, Houston, TX, ²University 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.¹, J. A. LAMACK, PH.D.¹, R. J. GERRITS, PH.D.¹, N. E. SCHLICK, PH.D.¹, AND L. FENNIGKOH, PH.D., P.E.¹

¹Milwaukee 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. ALI¹, AND R. G. VOSS¹

¹University of Texas, Austin, TX

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

K. R. CSAVINA¹, AND M. VENGLAR¹

¹Florida 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. LIU¹, B. W. GRAF¹, H. TU¹, E. J. CHANEY¹, U. SHARMA¹, AND S. A. BOPPART¹

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

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

K. DEVISETTI¹, AND F. DIBIANCA¹

¹University 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. MALIK¹, AND G. L. CÔTÉ¹

¹Texas A&M University, College Station, TX

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

S. ARIKAPUDI¹, AND F. A. DIBIANCA¹

¹University of Tennessee Health Science Center, Memphis, TN

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

K. H. GILCHRIST¹, AND S. GREGO¹

¹RTI International, Research Triangle Park, NC

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

J. SALAZAR¹, C-W. KAN¹, D. CÔTÉ², K. SOKOLOV³, AND M. K. MARKEY¹

¹The University of Texas at Austin, Austin, TX, ²Centre de Recherche Université Laval Robert Giffard, Quebec City, Quebec, Canada, ³The 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. NAYAK¹, L. WALKER¹, AND C. PIERPAOLI¹

¹NICHD, National Institutes of Health, Bethesda, MD

PS-9A-3-11 Investigating the Carbodiimide Mediated Conjugation of Quantum Dots to ProteinsF. SONG¹, AND W. C. CHAN¹¹University of Toronto, Toronto, Ontario, Canada**PS-9A-3-12** Optode-Based High-Resolution Chemical Imaging of 2D SurfacesP. AHUJA¹, S. NAIR¹, AND M. GRATZL¹¹Case Western Reserve University, Cleveland, OH**PS-9A-3-13** CT Based Three-Dimensional Measurement of Orbit and Eye AnthropometryK. L. LOFTIS¹, A. A. WEAVER¹, J. C. TAN², S. M. DUMA^{3,4}, AND J. D. STITZEL^{1,2}¹VT-WFVU Center for Injury Biomechanics, Winston-Salem, NC, ²Wake Forest University School of Medicine, Winston-Salem, NC, ³VT-WFVU Center for Injury Biomechanics, Blacksburg, VA, ⁴Virginia Polytechnic Institute and State University, Blacksburg, VA**PS-9A-3-14** Compact and Light-weight Telemedicine Microscope based on Lensfree On-Chip ImagingO. MUDANYALI¹, D. TSENG¹, S. O. ISIKMAN¹, I. SENCAN¹, W. BISHARA¹, C. OZTOPRAK¹, S. SEO², B. KHADEMHOSEINI¹, AND A. OZCAN^{1,3}¹UCLA, Los Angeles, CA, ²Korea University, Seoul, Jochiwon, Korea, Republic of, ³California NanoSystems Institute (CNSI), Los Angeles, CA**PS-9A-3-15** Multiphoton Microscopy of Cleared Mouse OrgansS. G. PARRA¹, T. H. CHIA¹, J. P. ZINTER¹, AND M. J. LEVENE¹¹Yale University, New Haven, CT**PS-9A-3-16** Primary Development of Emmetropic Spectacles: Ranging SystemQ. DU¹, AND F. A. DIBIANCA¹¹University 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. LOPEZ¹, G. DAABOUL¹, J. H. CONNOR¹, AND S. UNLU¹¹Boston University, Boston, MA**PS-9A-3-18** Parameters Affecting Light Transmission through Tissue Using Optical Clearing DevicesA. IZQUIERDO-ROMAN¹, W. C. VOGT¹, R. ANDRIANI¹, AND C. G. RYLANDER¹¹Virginia Tech, Blacksburg, VA**PS-9A-3-19** Effect of Mechanical Compression on Refractive Index and Optical Penetration Depth of Light in SkinA. A. GURJARPADHYE¹, W. C. VOGT¹, A. IZQUIERDO-ROMAN¹, AND C. G. RYLANDER¹¹Virginia Polytechnic and State University, Blacksburg, VA**PS-9A-3-20** Automated Detection of Fiducial Points in 3D Torso ImagesM. M. KAWALE¹, A. BOSE¹, G. P. REECE², E. K. BEAHM², M. A. CROSBY², M. K. MARKEY³, AND F. A. MERCHANT^{1,4}¹University of Houston, Houston, TX, ²The University of Texas MD Anderson Cancer Center, Houston, TX, ³The University of Texas at Austin, Austin, TX, ⁴University of Houston, Houston, TX**PS-9A-3-21** Visualization Tools for Pol-MC to Simulate Polarized Light-Tissue InteractionA. MIRANDA¹, C-W. KAN¹, D. CÔTÉ², K. SOKOLOV³, AND M. K. MARKEY¹¹The University of Texas at Austin, Austin, TX, ²Centre de Recherche Université Laval Robert Giffard, Quebec City, Quebec, Canada, ³The 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. NOELCK¹, Y. HU¹, AND R. DREZEK¹¹Rice University, Houston, TX**PS-9A-3-23** Novel Compact Flexible Endoscope Design for Simultaneous Wide-field Multispectral Fluorescence Lifetime Imaging Microscopy (FLIM)S. CHENG¹, J. JABBOUR¹, K. MAITLAND¹, AND J. A. JO¹¹Texas A&M University, College Station, TX**PS-9A-3-24** High-resolution Lensfree On-chip Microscopy for Wide-field ImagingW. BISHARA¹, T-W. SU¹, A. F. COSKUN¹, AND A. OZCAN^{1,2}¹UCLA Electrical Engineering Department, Los Angeles, CA, ²California NanoSystems Institute, UCLA, Los Angeles, CA**PS-9A-3-25** Liver Tissue Analysis Using a Multiclass Algorithm and Dual-Excitation Autofluorescence SpectroscopyV. R. SAUVAGE¹, H. T. NGUYEN^{1,2}, R. HILL¹, D. CONCAS¹, A. LEVENE¹, M. R. THURSD¹, R. D. GOLDIN¹, Q. M. ANSTEE¹, AND D. S. ELSON¹¹Imperial College London, London, United Kingdom, ²École Normale Supérieure de Cachan, Cachan, France**PS-9A-3-26** A LabVIEW-based Operating sSystem for a Multi-channel MRI TransmitterK. L. MOODY¹, N. A. HOLLINGSWORTH¹, D. NOLL², S. M. WRIGHT¹, AND M. P. MCDUGALL¹¹Texas A&M University, College Station, TX, ²University of Michigan, Ann Arbor, MI**PS-9A-3-27** High Frequency Ultrasound Characterization of Three-Dimensional Engineered TissuesN. BERRY¹, M. HELGUERA², D. HOCKING¹, AND D. DALECKI¹¹University of Rochester, Rochester, NY, ²Rochester Institute of Technology, Rochester, NY**PS-9A-3-28** TIM-OS, A General Monte Carlo Optical Simulator for Biomedical OpticsH. SHEN¹, W. C. VOGT¹, C. G. RYLANDER¹, AND G. WANG¹¹Virginia Tech, Blacksburg, VA**PS-9A-3-29** Development of a Red Blood Cell-based Sensing Platform for Continuous Blood Analyte MonitoringS. RITTER¹, M. MILANICK², AND K. MEISSNER¹¹Texas A&M University, College Station, TX, ²University of Missouri, Columbia, MO**PS-9A-3-30** Ultrasound Image Analysis of Localized Pediatric SclerodermaJ. M. DESAI¹, S. LI², A. RITTER¹, AND H. MAN¹¹Stevens Institute of Technology, Hoboken, NJ, ²Hackensack University Medical Center, Hackensack, NJ**PS-9A-3-31** Combined AFM-WGM Sensing-Imaging Technique Using QD Embedded MicrospheresS. AMINI¹, Z. SUN², G. A. MEININGER², AND K. E. MEISSNER¹¹Texas A&M University, College Station, TX, ²University of Missouri, Columbia, MO**PS-9A-3-32** Preliminary Quality Assessment of Speckle Patterns on Soft Tissues for Digital Image CorrelationJ. NING¹, V. G. BRAXTON², Y. WANG¹, M. A. SUTTON¹, Y. WANG¹, AND S. M. LESSNER²¹University of South Carolina, Columbia, SC, ²University of South Carolina School of Medicine, Columbia, SC**PS-9A-3-33** Time-resolved Fluorescence Spectroscopy for Intraoperative Diagnosis of Oral CancerH. XIE¹, Y. SUN¹, AND L. MARCU¹¹University of California - Davis, Davis, CA**PS-9A-3-34** A Fourth Gradient Coil for Slice Dependent Phase Compensation with Planar RF Coil ArraysJ. C. BOSSHARD¹, E. P. EIGENBRODT¹, M. P. MCDUGALL¹, AND S. M. WRIGHT¹¹Texas 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. PARK¹, J. A. JO¹, S. SHRESTA¹, P. PANDE¹, AND B. E. APPLEGATE¹¹Texas A&M University, College Station, TX**PS-9A-3-36** Development of a Whole-spectrum Fluorescence MicroscopeR. PETERSON¹, S. XIAO¹, S. HUSSAIN¹, V. E. CENTONZE², J. D. LECHLEITER², AND J. YE¹¹UTSA, San Antonio, TX, ²UTHSCSA, San Antonio, TX**PS-9A-3-37** Integrating Fourier Phase Microscopy with Optical Tweezers to Study Plasma Membrane MechanicsM. SARSHAR¹, N. KHATIBZADEH¹, S. GUPTA¹, W. E. BROWNELL², AND B. ANVARI¹¹University of California, Riverside, Riverside, CA, ²Baylor College of Medicine, Houston, TX

PS-9A-3-38 Design Considerations When Adapting a Planar Array of Coils for 3D WFOV MicroscopyE. P. EIGENBRODT¹, J. BOSSHARD¹, S. M. WRIGHT¹, AND M. P. MCDUGALL¹¹Texas A&M University, College Station, TX**PS-9A-3-39** Common-Path Endoscopic Fourier Domain OCT with a Michelson Interferometer-based CompensatorR. WANG¹, R. GOODWIN², R. R. MARKWALD³, AND B. Z. GAO¹¹Clemson Univ., Clemson, SC, ²University of South Carolina, Columbia, SC, ³Medical University of South Carolina, Charleston, SC**PS-9A-3-40** Lensless On-chip Microscope as a Portable Semen Analysis DeviceT-W. SU¹, D. K. TSENG¹, AND A. OZCAN¹¹University of California, Los Angeles, Los Angeles, CA**PS-9A-3-41** Development of a Multimodal Tissue Diagnostic SystemY. SUN¹, Y. H. SUN¹, D. S. ELSON², H. XIE¹, M. LAM¹, J. PHIPPS¹, S. TINGLING¹, G. FARWELL¹, J. M. CANNATA³, K. SHUNG³, AND L. MARCU¹¹UC Davis, Davis, CA, ²Imperial College of London, London, United Kingdom, ³University of Southern California, Los Angeles, CA**PS-9A-3-42** Multiphoton Flow Cytometry for the Characterization and Purification of Large Cellular AggregatesD. G. BUSCHKE¹, J. SQUIRRELL¹, K. ELICEIRI¹, AND B. OGLE¹¹University of Wisconsin-Madison, Madison, WI**PS-9A-3-43** Malaria Detection DeviceS. KHOSLA¹, J. DIAN², M. LABRECQUE², A. PERSAD² AND S. MEHRYAR²¹Sentinel Medical Inc., ²University 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. MAHLER¹, AND J. T. BUTCHER¹¹Cornell University, Ithaca, NY**PS-9A-4-45** A Computational Model to Quantify Leaflet Wrinkling: Road to Assess Tissue Fatigue & Leaflet TearingA. FALAHATPISHEH¹, AND A. KHERADVAR¹¹University of South Carolina, Columbia, SC**PS-9A-4-46** Pathologic Alterations in Shear Stress Magnitude Induce Valvular Endothelial ActivationD. HOEHN¹, L. SUN¹, AND P. SUCOSKY¹¹University of Notre Dame, Notre Dame, IN**PS-9A-4-47** Annulus Tension of Tricuspid Valve AnnulusS. BHATTACHARYA¹, AND Z. HE¹¹Texas Tech University, Lubbock, TX**PS-9A-4-48** Valvular Endothelial Cell-Derived Nitric Oxide Reduces Interstitial Cell CalcificationJ. RICHARDS¹, S. CHEN¹, AND J. BUTCHER¹¹Cornell University, Ithaca, NY**PS-9A-4-49** Micromechanics of the Anterior Mitral Valve Leaflet Under Physiological DeformationsC. A. CARRUTHERS¹, J. LIAO², AND M. S. SACKS¹¹University of Pittsburgh, Pittsburgh, PA, ²Mississippi State University, Mississippi State, MS**PS-9A-4-50** Cyclic Strain Activates Aortic Valve Endothelial Cells in a Side-Specific MannerS. A. METZLER¹, C. MCINTOSH¹, A. RUHL¹, AND J. N. WARNOCK¹¹Mississippi State University, Mississippi State, MS**PS-9A-4-51** Measurement of Chordal Forces of the Tricuspid Valve using Miniature C RingsL. G. TROXLER¹¹Georgia Tech Institute for Science and Technology, Conyers, GA**PS-9A-4-52** Characterization of Bicuspid Aortic Valve Hemodynamics using Particle Image Velocimetry (PIV)N. SAIKRISHNAN¹, C-H. YAP¹, AND A. P. YOGANATHAN¹¹Georgia Institute of Technology, Atlanta, GA**PS-9A-4-53** Determination of Atrioventricular Cushion Material Properties in a Developing Chick EmbryoS. BIECHLER¹, J. MORAVEJI¹, J. W. WEIDNER¹, R. L. GOODWIN¹, D. DEAN², AND A. KHERADVAR¹¹University of South Carolina, Columbia, SC, ²Clemson University, Clemson, SC**PS-9A-4-54** Tricuspid Valve Leaflet Stretch: The Effect of Diseased Conditions and a Saddle-Shaped AnnulusD. BUICE¹, E. SPINNER^{1,2}, C. YAP¹, AND A. YOGANATHAN¹¹Georgia Institute of Technology, Atlanta, GA, ²Emory University, Atlanta, GA**PS-9A-4-55** Meso-Scale Testing of Fiber Bundles and Membranes of the Aortic ValveC. A. ROCK¹, O. KOMOLAFE¹, AND T. DOEHRING¹¹Drexel University, Philadelphia, PA**Track: Cardiovascular Engineering – PS-9A-5****Thrombosis and Hemostasis****PS-9A-5-56** Engineering an Actively Thromboresistant Blood-contacting InterfaceZ. QU¹, S. MUTHUKRISHNAN², M. K. URLAM², C. A. HALLER², V. KUMAR¹, U. M. MARZEC^{3,4}, S. R. HANSON^{3,4}, J. LAHANN⁵, AND E. L. CHAIKOF^{1,2}¹Georgia Institute of Technology, Atlanta, GA, ²Emory University, Atlanta, GA, ³Oregon National Primate Research Center, Beaverton, OR, ⁴Oregon Health and Science University, Portland, OR, ⁵University of Michigan, Ann Arbor, MI**PS-9A-5-57** The Effects of Wall Shear Rate on Microparticle (MP) Adhesion to Plasma FibronectinY-H. LEE¹, M. FRANCIS-SEDLAK¹, C. HALL², AND V. TURITTO¹¹Illinois Institute of Technology, Chicago, IL, ²The College of New Jersey, Ewing, NJ**PS-9A-5-58** Amphiphilic Silicones with Reduced Blood Protein AdsorptionM. L. GIESE¹, B. M. BAILEY¹, AND M. A. GRUNLAN¹¹Texas A&M University, College Station, TX**PS-9A-5-59** A Novel Characterization of Platelet Deposition in a Focal Injury ModelT. V. COLACE¹¹University of Pennsylvania, Philadelphia, PA**PS-9A-5-60** The VWF Propeptide Binds And Inhibits The Function of Multimeric VWF In BloodS. R. MADABHUSHI¹, C. SHANG¹, K. M. DAYANANDA¹, T. RYAN², AND S. NEELAMEGHAM¹¹State University of New York at Buffalo, Buffalo, NY, ²Reichert Inc., Depew, NY**PS-9A-5-61** Thrombin Flux and Shear Rate Regulate Fibrin Fiber Deposition State During Polymerization Under FlowK. NEEVES^{1,2}, D. ILLING¹, AND S. DIAMOND³¹Colorado School of Mines, Golden, CO, ²University of Colorado, Denver, Aurora, CO, ³University of Pennsylvania, Philadelphia, PA**PS-9A-5-62** Polymer Hydrogel for Hemostatic ApplicationA. M. BEHRENS¹, B. J. CASEY¹, Z. TSINAS², J. R. HESS³, Z. J. WU³, B. P. GRIFFITH³, AND P. KOFINAS¹¹University of Maryland, College Park, MD, ²National Technical University of Athens, Athens, Greece, ³University 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. REN¹, AND G. BAO¹¹Georgia Institute of Technology, Atlanta, GA**PS-9A-5-64** Effect of Platelet-Derived Nitric Oxide on Platelet Percentage Coverage under Static ConditionsM. G. WATSON¹, J. M. LOPEZ¹, A. J. VEVERKA², AND S. A. JONES¹¹Louisiana Tech University, Ruston, LA, ²University of Akron, Akron, OH**PS-9A-5-65** Computational Model of Mural Thrombogenesis Predicts Platelet Deposition Rates in Baboon ModelsS. RUGONYI¹, E. TUCKER¹, U. MARZEC¹, A. GRUBER¹, AND S. HANSON¹¹Oregon Health & Science University, Portland, OR**PS-9A-5-66** Improving Layer-by-Layer Nanoassembly Surface Morphology: Dynamic Layered Flat BiointerfacesJ. M. LOPEZ¹, M. G. WATSON¹, AND S. A. JONES¹¹Louisiana Tech University, Ruston, LA**PS-9A-5-67** Hemocompatibility of a Novel Hyaluronan-High Density Polyethylene CompositeS. S. YONEMURA¹, B. S. SMITH¹, M. H. FORLEO¹, S. P. JAMES^{1,2}, K. C. POPAT^{1,2}, AND L. P. DASI^{1,2}¹School of Biomedical Engineering, Colorado State University, Fort Collins, CO, ²Department 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. BUCHANAN¹, C. S. SZOT¹, S. AKMAN², J. W. FREEMAN¹, AND M. N. RYLANDER¹¹Virginia Tech, Blacksburg, VA, ²Wake Forest University School of Medicine, Winston-Salem, NC**PS-9A-6-69** Mechanobiology of Mammary Stroma Following Radiation Therapy (RT)M. A. QAYYUM^{1,2}, J. XU¹, AND M. F. INSANA^{1,2}¹University of Illinois, Urbana, IL, ²Beckman Institute for Advanced Science and Technology, Urbana, IL**PS-9A-6-70** The Role of Biophysical and Biochemical Signals in Epithelial-Mesenchymal TransitionQ. K. CHEN¹, E. W. GOMEZ¹, D. C. RADISKY², AND C. M. NELSON¹¹Princeton University, Princeton, NJ, ²Mayo Clinic Cancer Center, Jacksonville, FL**PS-9A-6-71** Mechanobiology at Topological Interfaces: Observations and Implications for Tumor InfiltrationT. A. ULRICH^{1,2}, AND S. KUMAR^{1,2}¹University of California, Berkeley, Berkeley, CA, ²UCSF/UC Berkeley Joint Graduate Group in Bioengineering, Berkeley, CA**PS-9A-6-72** Bacteria Invasion Mechanism in Cancer and Normal CellsJ. HONG¹, S. PARK¹, AND J. H. SHIN¹¹KAIST, Daejeon, Daejeon, Korea, Republic of**PS-9A-6-73** Adhesion of Wild Type and 4 Signaling-defect Mammary Cancer Cells to Brain EndotheliumJ. FAN¹, B. CAI¹, Y. HAO², F. GIANCOTTI², AND B. M. FU¹¹The City College of New York, New York, NY, ²Memorial Sloan-Kettering Cancer Institute, New York, NY**PS-9A-6-74** Force Characterization of Tissue from Normal, Pre-invasive and Invasive Breast CancerC. C. DUFORT¹, J. LOPEZ¹, H. YU¹, I. KANG¹, I. ACERBI², S. HWANG¹, A. AU¹, AND V. WEAVER¹¹University of California, San Francisco, San Francisco, CA, ²Universitat de Barcelona, Barcelona, Spain**PS-9A-6-75** Laminin Enhances Expansion of a Bone Marrow Precursor in The Presence of Tumor FactorsH. NANDIGAN¹, J. MCGINTY², M. PATE², AND F. BENENCIA^{1,2}¹Russ College of Engineering, Ohio University, Athens, OH, ²OUCOM, Ohio University, Athens, OH**PS-9A-6-76** Biophysical Characterization of CD44v-Counter Receptor Interactions using Force SpectroscopyP. S. RAMAN¹, C. S. ALVES¹, D. WIRTZ¹, AND K. KONSTANTOPOULOS¹¹Johns Hopkins University, Baltimore, Maryland**PS-9A-6-77** Increased Asymmetric and Multi-Polar Divisions in Mechanically Confined MicroenvironmentsW. M. WEAVER¹, H. T. TSE¹, AND D. DI CARLO^{1,2}¹University of California, Los Angeles, Los Angeles, CA, ²California NanoSystems Institute, Los Angeles, CA**PS-9A-6-78** The Interplay Between Three Dimensional Microenvironment and Breast Cancer InvasionL. CASSEREAU¹, J. LOPEZ², AND V. WEAVER^{2,3}¹UC Berkeley/UCSF, Berkeley, CA, ²UCSF, San Francisco, CA, ³Institute of Regenerative Medicine, UCSF, San Francisco, CA**PS-9A-6-79** Substrate Elasticity Mediates Metastasis Like Phenotype In Vitro in HCT-8 CellsX. TANG¹, T. B. KUHLENSCHMIDT¹, M. S. KUHLENSCHMIDT¹, AND T. A. SAIF¹¹University of Illinois at Urbana-Champaign, Urbana, IL**PS-9A-6-80** Development of Cancer Traps for Eliminating Metastatic Cancer Cells In VivoC-Y. KO^{1,2}, A. NAIR^{1,3}, Y-T. TSAI^{1,3}, J. ZHOU¹, AND L. TANG^{1,3}¹The University of Texas at Arlington, Arlington, TX, ²The University of Texas Southwestern Medical Center at Dallas, Dallas, TX, ³The 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 RITE¹, Y. A. LAZRAK¹, M. PAGNON¹, P. BOSE², C. KURKJIAN², V. I. SIKAVITSAS¹, AND R. G. HARRISON¹¹University of Oklahoma, Norman, OK, ²University of Oklahoma Health Sciences Center, Oklahoma City, OK**PS-9A-6-82** Mechanical Compression Stimulates Coordinated Migration of Mammary Carcinoma CellsJ. M. TSE^{1,2}, G. CHENG², J. A. TYRRELL³, S. A. WILCOX-ADELMAN⁴, Y. BOUCHER², R. K. JAIN², AND L. L. MUNN²¹Massachusetts Institute of Technology, Cambridge, MA, ²Massachusetts General Hospital, Charlestown, MA, ³Thomson Reuters, Rochester, New York, ⁴Boston Biomedical Research Institute, Watertown, MA**PS-9A-6-83** Study of Altered Metabolism due to Spherogenicity and Anoikis in Ovarian CancerC. A. CANEBA¹, N. BELLANCE¹, T. KAREDDATH¹, P. RAMAKRISHNAN¹, L. PABST¹, S. A. HUSSAIN¹, A. BOZHCHENKO¹, AND D. NAGRATH¹¹Rice 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 TiO₂ Thin Films in Photocatalytic Oxygen Generation**A. PERRIN¹, S. M. MIJAILOVICH², AND R. J. GILBERT³¹Caritas St. Elizabeth's Medical Center, Brighton, MA, ²Harvard School of Public Health, Boston, MA, ³Caritas St. Elizabeth's Medical Center, Boston, MA**PS-9A-7-85 Fiberoptic Microneedle Device for Laser Lipolysis**Y. CHEN¹, M. A. KOSOGLU¹, R. L. HOOD¹, AND C. G. RYLANDER¹¹Virginia Polytechnic Institute and State University, Blacksburg, VA**PS-9A-7-86 Real Time DNA Amplification Using a Novel Microfluidic Tablet Platform**S. ANGIONE¹, J. LEE¹, L. MERMEZ², AND A. TRIPATHI¹¹Brown University, Providence, RI, ²Rhode Island Hospital, Providence, RI**PS-9A-7-87 Development of a High-Throughput Biofilm Chip for Accelerated Antifungal Drug Discovery**A. SRINIVASAN¹, P. UPPULURI¹, J. L. LOPEZ-RIBOT¹, AND A. K. RAMASUBRAMANIAN¹¹University 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-BAVARSAD¹, AND R. L. MAHAJAN¹¹Institute 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. MCPHERSON¹, AND G. M. WALKER¹¹North Carolina State University, Raleigh, NC**PS-9A-8-90 BIO-MEMS Impedance Sensor for Detecting E.coli O57:H7**M. DWEIK¹¹Lincoln University, Jefferson City, MO**PS-9A-8-91 Intensity-based Quantum Dot Barcode Identification Scheme towards Portable Disease Diagnostic Device**K. MING¹, AND W. CHAN¹¹University of Toronto, Toronto, Ontario, Canada**PS-9A-8-92 Bioanalytical Applications Using a Silicon-nanowire Drop-based Magnetic Microfluidic Platform**A. EGATZ-GOMEZ¹¹Texas A&M University TEES, College Station, TX**PS-9A-8-93 Progress in the Development of a Wireless Stimulator for Gastroparesis**S. DEB¹, T. ABELL², W-D. HUANG¹, C. LAHR³, AND J-C. CHIAO¹¹University of Texas at Arlington, Arlington, TX, ²University of Mississippi Medical Center, Jackson, MS, ³University 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. SEO¹, W-D. HUANG¹, AND J-C. CHIAO¹¹University 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. HONDROULIS¹, C. LIU¹, AND C-Z. LI¹¹Florida International University, Miami, FL**PS-9A-8-96 Microfluidic Endothelial Progenitor Cell Capture Technology for Cardiovascular Diagnostic Medicine**B. D. PLOUFFE¹, G. HANSMANN^{2,3}, AND S. K. MURTHY¹¹Northeastern University, Boston, MA, ²Children's Hospital Boston, Boston, MA, ³Harvard Medical School, Boston, MA**PS-9A-8-97 Volatile Alkanes Micro Preconcentration for Breath Analysis Based Cancer Screening**B. ALFEELI¹, AND M. AGAH¹¹Virginia Tech, Blacksburg, VA**PS-9A-8-98 In Vivo Transdermal SERS Glucose Measurements Using Spatially Offset Raman Spectroscopy**J. M. YUEN¹, R. P. VAN DUYN¹, J. T. WALSH¹, AND M. R. GLUCKSBERG¹¹Northwestern University, Evanston, IL**PS-9A-8-99 Development of a Microfluidic Reactor for Influenza A Subtyping**S. E. MCCALLA¹, A. SARMA², C. ONG¹, S. M. OPAL³, A. W. ARTENSTEIN⁴, AND A. TRIPATHI¹¹Brown University, Providence, RI, ²Harvard University, Cambridge, MA, ³Rhode Island Hospital, Providence, RI, ⁴Memorial 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. TRANTUM¹, R. L. MERNAUGH¹, D. W. WRIGHT¹, AND F. R. HASELTON¹¹Vanderbilt University, Nashville, TN**PS-9A-8-101 One-step Extraction of Nucleic Acids from Clinical Samples**H. BORDELON¹, N. ADAMS¹, A. KLEMM¹, P. RUSS¹, J. WILLIAMS¹, D. WRIGHT¹, AND F. R. HASELTON¹¹Vanderbilt University, Nashville, TN**PS-9A-8-102 Development of a Novel Nano-Biosensor Chip Based on Surface Plasmon Resonance for Rapid Medical Diagnostics**M. VENKATARAMASUBRAMANIAN¹, AND L. TANG¹¹University Of Texas at San Antonio, San Antonio, TX**PS-9A-8-103 Quantitative Characterization of Microelectroporated T cells Using Flow Cytometry**D. J. STARK¹, T. C. KILLIAN¹, AND R. M. RAPHAEL¹¹Rice University, Houston, TX**PS-9A-8-104 Optically Forced Cytometry (OFC) for In Situ Bio-nano-particle Enumeration**Y. HU¹, D. OU-YANG¹, AND X. CHENG¹¹Lehigh University, Bethlehem, PA**PS-9A-8-105 Towards Non-Invasive Breath Monitoring with Microsensor Arrays**B. RAMAN¹, K. BENKSTEIN², C. MUNGLE², C. MONTGOMERY², C. J. MARTINEZ³, AND S. SEMANCIK²¹Washington University, St. Louis, MO, ²National Institutes of Standards and Technology, Gaithersburg, Maryland, ³Purdue University, West Lafayette, IN**PS-9A-8-106 Rapid In-Field Detection of Viral Bioterrorism Agents via Complex Fluid Systems**F. MASHAYEKHI¹, Y. T. CHIU¹, A. LE¹, F. C. CHAO¹, B. M. WU¹, AND D. T. KAMEI¹¹UCLA, Los Angeles, CA**PS-9A-8-107 An Asynchronous Magnetic Bead Rotation Assay: A magnetic Torque-based Biosensor**A. H. HECHT¹, P. KINNUNEN¹, B. MCNAUGHTON¹, AND R. KOPELMAN¹¹University of Michigan, Ann Arbor, MI

PS-9A-8-108 High Density Multiplexed Microfluidic Platforms for Rapid, Informative Plasma Protein Detection in Cancer DiagnosticsO. VERMESH^{1,2}, AND U. VERMESH¹¹California Institute of Technology, Pasadena, CA, ²The 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. HERREN¹, P. JOTHIMUTHU¹, R. A. WILSON¹, H. WONG², W. R. HEINEMAN¹, AND I. PAPAUTSKY¹¹University of Cincinnati, Cincinnati, OH, ²Cincinnati Childrens Hospital Medical Center, Cincinnati, OH**PS-9A-8-110** Multiplexed, Rapid, Point of Care Device to Quantify Allergen-Specific IgEM. R. MONROE¹, G. DAABOUL¹, A. REDDINGTON¹, S. UNLU¹, AND F. LITTLE¹¹Boston University, Boston, MA**PS-9A-8-111** Device For Minimally Invasive Non-Destructive Analysis of Local Tissue BiomechanicsR. A. GOULD¹, G. TARSİ¹, A. BOZKURT¹, AND J. BUTCHER¹¹Cornell University, Ithaca, NY**PS-9A-8-112** Enhancing MRI Contrast of Fe₃O₄ Nanoparticles via Porous Si EntrapmentJ. M. KINSELLA¹, S. ANANDA¹, AND M. SAILOR¹¹University of California, San Diego, La Jolla, CA**PS-9A-8-113** Biomimetic Separation of Blood Cells on a Microfluidic PlatformA. JAIN^{1,2}, AND L. MUNN¹¹Massachusetts General Hospital, Charlestown, MA, ²Boston University, Boston, MA**PS-9A-8-114** Quantum Dot-Microbeads for Genetic Detection in Non-Amplified DNA SamplesY. GAO¹, W. L. STANFORD¹, AND W. C. CHAN¹¹University of Toronto, Toronto, ON, Canada**PS-9A-8-115** An Intracranial Volume Sensor to Monitor Ventricular EnlargementS. BASATI¹, M. LARIVIERE², R. PENN¹, AND A. LINNINGER¹¹University of Illinois at Chicago, Chicago, IL, ²University 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. YOUNG¹, AND A. G. LACKO²¹North Carolina State, Raleigh, NC, ²University 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. LEE¹, D. SUNG¹, AND S-W. SEO¹¹Biomedical Engineering Interdisciplinary program, School of Medicine, Sungkyunkwan University, Seoul, Korea, Republic of**PS-9A-10-118** Towards the Development of Mucus Penetrating DNA NanoparticlesN. BOYLAN¹, J. SUK², S. LAI^{1,3}, R. JELINEK⁴, M. BOYLE², AND J. HANES^{3,5}¹The Johns Hopkins University, Baltimore, MD, ²The Johns Hopkins University School of Medicine, Baltimore, MD, ³Institute for NanoBioTechnology, Baltimore, MD, ⁴Ben-Gurion University, Beersheba, Israel, ⁵Wilmer 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. LIN¹, G. JIANG¹, AND M. E.H. EL-SAYED¹¹University of Michigan, Ann Arbor, MI**PS-9A-10-120** Understanding the Selective Transfection Mediated by Pentablock Copolymers with Study on Rate Limiting StepsB. ZHANG¹, AND S. K. MALLAPRAGADA¹¹Iowa State University, Ames, IA**PS-9A-10-121** Gene Expression Profiling of Cells Transfected with Nonviral VectorsS. A. PLAUTZ¹, G. BOANCA¹, J-J. M. RIETHOVEN¹, AND A. K. PANNIER¹¹University of Nebraska-Lincoln, Lincoln, NE**PS-9A-10-122** Small Molecular Changes to Gene Delivery Polymers Varies Transfection Efficacy Between 2D and 3DN. S. BHISE¹, R. GRAY¹, J. SUNSHINE¹, S. HTET¹, J. GREEN¹, AND A. EWALD¹¹Johns Hopkins School of Medicine, Baltimore, MD**PS-9A-10-123** The Role of Endocytosis in the Uptake and Internalization of Plasmid DNA Following ElectroporationM. WU¹, AND F. YUAN¹¹Duke University, Durham, NC**PS-9A-10-124** Conjugation of Nucleic Acids to Gold Nanorods for Site-specific Delivery Using Photothermal ReleaseT. A. LARSON¹, S. CHIRIELEISON¹, A. ELLINGTON¹, AND K. SOKOLOV^{1,2}¹UT Austin, Austin, TX, ²MD Anderson Cancer Center, Houston, TX**PS-9A-10-125** Novel Block Copolypeptide Vesicles as Potential Transfection AgentsU-J. CHOE¹, V. Z. SUN¹, A. R. RODRIGUEZ¹, H. DAI¹, T. J. DEMING¹, AND D. T. KAMEI¹¹UCLA, Los Angeles, CA**PS-9A-10-126** Intramyocardial Delivery of Functionalized Nanoparticles for Cardioprotection after InfarctionM. CHENG^{1,2}, C. CHANG¹, W. LIAO², A. TANG², C. YEH³, Y. YANG⁴, AND P. HSIEH⁵¹Biomedical Engineering, Tainan, Taiwan, Taiwan, ²Clinical Medicine & Research Center of Clinical Medicine, Tainan, Taiwan, Taiwan, ³Chemistry, Tainan, Taiwan, Taiwan, ⁴Surgery, Tainan, Taiwan, Taiwan, ⁵Biomedical Sciences, Academia Sinica, Taipei, Taiwan, Taiwan**PS-9A-10-127** Functional Performance of Polyplexes Self-assembled in Microfluidics-generated DropletsC. L. GRIGSBY¹, Y-P. HO¹, AND K. W. LEONG¹¹Duke University, Durham, NC**PS-9A-10-128** In Vivo Gene Delivery with Biodegrading NanoparticlesA. J. DITTO¹, J. J. REHO¹, J. A. SMOLEN¹, J. H. HOLDA¹, R. J. RAMIREZ¹, AND Y. H. YUN¹¹University of Akron, Akron, OH**PS-9A-10-129** Synthesis and Biological Evaluation of Multifunctional Peptide-HPMA Copolymers as Nucleic Acid Delivery VehiclesR. N. JOHNSON¹, J. SHI¹, R. BURKE¹, A. HOFFMAN¹, P. STAYTON¹, AND S. H. PUN¹¹University of Washington, Seattle, WA**PS-9A-10-130** Apoptosis of Human Colon Cancer Cells by Silencing Eukaryotic Translation Initiation Factor 2 AlphaC-H. WANG¹, AND C-A. PENG¹¹Michigan Technological University, Houghton, MI**PS-9A-10-131** The Effect of Swelling and Cationic Character On Gene Transfection by pH-Responsive NanocarriersJ-O. YOU¹, R. E. HORTON¹, AND D. T. AUGUSTE¹¹Harvard University, Cambridge, MA**PS-9A-10-132** Well-defined Synthetic Polymers for DNA Vaccine Delivery: Uptake and Subcellular Trafficking in Dendritic CellsD. PANUS¹, W. JI¹, AND C. WANG¹¹University 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. YANG¹, S. ASKAROVA¹, W. SHENG¹, G. YAO¹, G. SUN¹, AND J. LEE¹¹University of Missouri, Columbia, MO**PS-9A-11-134 The Effects of Substrate Rigidity on Neuronal Precursor Cells**M. L. PREVITERA¹, M. HUI¹, M. S. DESAI¹, D. VERMA¹, R. S. SCHLOSS¹, AND N. A. LANGRANA¹¹Rutgers University, Piscataway, NJ**PS-9A-11-135 Poly(3,4-ethylene dioxythiophene) Enables 38.5 μm² Recording Site for Carbon Fiber Based Electrodes**T. D. KOZAI¹, P. R. PATEL¹, N. B. LANGHALS¹, X. DENG¹, H. ZHANG¹, J. LAHANN¹, N. A. KOTOV¹, AND D. R. KIPKE¹¹University of Michigan, Ann Arbor, MI**PS-9A-11-136 An Integrated Probe for Sensing Neurotransmitters**H. CAO¹, Y-B. PENG¹, AND J-C. CHIAO¹¹University 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. FARAJIDAVAR¹, C. HAGAINS¹, Y. PENG¹, AND J-C. CHIAO¹¹THE 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. JANG¹, AND Y. NAM¹¹KAIST, Daejeon, Chungnam, Korea, Republic of**PS-9A-11-139 A Preliminary Study of Motor Unit Discrimination from Surface EMG Using EMGLAB**F. J. NEZHAD¹, X. LI¹, W. Z. RYMER^{1,2}, AND P. ZHOU^{1,2}¹Rehabilitation Institute of Chicago, Chicago, IL, ²Northwestern University, Chicago, IL**PS-9A-11-140 In Vitro stability and In Vivo performance of PEDOT coatings for neural microstimulation**S. J. WILKS¹, A. S. KOIVUNEMI^{1,2}, AND K. J. OTTO¹¹Purdue University, West Lafayette, IN, ²Indiana University, Indianapolis, IN**PS-9A-11-141 Improving the Assessment of Tremor and Bradykinesia Using the Tablet PC**M. ZHANG¹, S. ASKARI¹, AND D. S. WON¹¹California State University, Los Angeles, Los Angeles, CA**PS-9A-11-142 Impulsive Pressurization of Neuronal Cells for Studying Traumatic Brain Injury**J. LEE¹, M. NIENABER¹, R. FENG¹, AND J. LIM¹¹University of Nebraska, Lincoln, NE**PS-9A-11-143 Development of a High-Throughput Screen for Novel Biomaterials in Neural Tissue Engineering**C. DUMONT¹, P. KARANDE¹, AND D. THOMPSON¹¹Rensselaer Polytechnic Institute, Troy, NY**PS-9A-11-144 3-D Integrated Neuromorphic Processor**J. PARK¹, T. YU^{1,2}, S. JOSHI¹, AND G. CAUWENBERGHS^{1,2}¹UCSD, La Jolla, CA, ²Institute of Neural Computation, La Jolla, CA**PS-9A-11-145 Tape-Transfer Assisted Cryosectioning for the Mouse Brain Architecture Project**V. PINSKIY^{1,2}, J. JONES¹, H. WANG¹, H. COX¹, AND P. MITRA¹¹Cold Spring Harbor Laboratory, Cold Spring Harbor, NY, ²Stony Brook University, Stony Brook, NY**PS-9A-11-146 Development of Mental Fatigue in Simulated Air Traffic Control Tasks Studied by EEG**D. DASARI¹, C. CROWE¹, C. LING¹, M. ZHU¹, L. BAILEY², J. CRUTCHFIELD², AND L. DING¹¹University of Oklahoma, Norman, OK, ²Federal Aviation Academy, Oklahoma City, OK**PS-9A-11-147 Improved Modeling and Application of Transcranial Magnetic Stimulation**T. KRIEG¹, AND D. MOGUL¹¹Illinois Institute of Technology, Chicago, IL**PS-9A-11-148 Monitoring the Depth of Anesthesia using the Time-Varying Spectral Features of EEG**E. E. KANG¹, H. EL BEHEIRY^{1,2}, J. WONG³, M. DEL CAMPO³, P. L. CARLEN^{1,3}, AND B. L. BARDAKJIAN¹¹University of Toronto, Toronto, Ontario, Canada, ²Trillium Health Centre, Toronto, Ontario, Canada, ³University Health Network, Toronto, Ontario, Canada**PS-9A-11-149 Electrical High Frequency Nerve Block of the Urethral Sphincter for Bladder Voiding**M. FRANKE^{1,2}, A. S. BOGER^{1,2}, N. BHADRA^{1,2}, AND K. J. GUSTAFSON^{1,2}¹Case Western Reserve University, Cleveland, OH, ²Louis 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. PU¹, L. SOLOMON², AND A. HUBBARD¹¹Boston University, Boston, MA, ²US Army Research Laboratory, Adelphi, MD**PS-9A-11-151 Methodology and Characteristics of Micropatterned Neural Networks**E. W. FRANCA¹, S. ALGAPAN¹, L. PAN¹, K. VARGHESE¹, G. J. BREWER², AND B. WHEELER¹¹University of Florida, Gainesville, FL, ²Southern Illinois University School of Medicine, Springfield, IL**PS-9A-11-152 IV Administered Copolymer Surfactant Poloxamer 188 Accelerates Peripheral Axon Regeneration**R. C. LEE¹¹University of Chicago, Chicago, IL**PS-9A-11-153 Carbon Nanotube Thread Supports Attachment and Differentiation of Murine Neural Cells in Culture**T. HOPKINS¹, J. VENNEMEYER¹, C. JAYASINGHE¹, V. SHANOV¹, AND S. PIXLEY¹¹University of Cincinnati, Cincinnati, OH**PS-9A-11-154 Novel Microchannel Device for Real Time Monitoring Tumor Cell Migration**S. VASUDEVAN¹, D. TAMULY¹, D. P. DAVE¹, S. M. IQBAL¹, R. BACHOO², AND Y-T. KIM¹¹University of Texas at Arlington, Arlington, TX, ²University 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. STUART¹, J. PADERI¹, M. STUREK², AND A. PANITCH¹¹Purdue University, West Lafayette, IN, ²Indiana 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. LINTON¹, R. C. SIMS¹, AND C. D. MILLER¹¹Utah State University, Logan, UT

PS-9A-12-157 A Temperature-Responsive Synthetic Antibody for Reversible Cell LabelingJ. ZHOU¹, B. SOONTORNWORAJIT¹, AND Y. WANG¹¹University of Connecticut, Storrs, CT**PS-9A-12-158** Self-assembling Peptides as Chemically Defined AdjuvantsJ. S. RUDRA¹, Y. F. TIAN¹, J. P. JUNG¹, AND J. H. COLLIER¹¹University of Chicago, Chicago, IL**PS-9A-12-159** Tunable Signal Processing in Synthetic MAP Kinase ModulesE. C. O'SHAUGHNESSY¹, S. PALANI², J. J. COLLINS¹, AND C. A. SARKAR²¹Howard Hughes Medical Institute and Boston University, Boston, MA, ²University 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 AmbulationJ. G. BLEDSOE¹, J. BUCHHEIT¹, S. OWEN¹, AND L. CANNADA¹¹Saint Louis University, St Louis, MO**PS-9A-13-161** Factors Influencing Tibial Loading Following Total Knee Arthroplasty: A Finite Element StudyS. TOKUNAGA¹, S. R. SMALL², R. D. ROGGE¹, M. E. BEREND², AND M. A. RITTER²¹Rose-Hulman Institute of Technology, Terre Haute, IN, ²JRSI Foundation, Inc., Mooresville, IN**PS-9A-13-162** Understanding Nanotopography Mediated Osteoblast Responses by Experiments and Mathematical ModelingL. YANG¹, V. CHINTHAPENTA¹, Q. LI¹, B. W. SHELDON¹, AND T. J. WEBSTER¹¹Brown University, Providence, RI**PS-9A-13-163** A Mechanistic Model of the Nanoscratch Test to Determine the In Situ Toughness of BoneA. ISLAM¹, X. DONG¹, AND X. WANG¹¹University of Texas at San Antonio, San Antonio, TX**PS-9A-13-164** Microdamage Induced Collagen Denaturation in BoneM. BANKA¹, M. APPLEFORD¹, AND X. WANG¹¹University of Texas at San Antonio, San Antonio, TX**PS-9A-13-165** High Initial Stability in Porous Titanium Acetabular Cup Designs: A Biomechanical StudyM. E. BEREND¹, S. R. SMALL¹, L. HOWARD², R. D. ROGGE², C. A. BUCKLEY², AND M. A. RITTER¹¹JRSI Foundation, Inc., Mooresville, IN, ²Rose-Hulman Institute of Technology, Terre Haute, IN**PS-9A-13-166** The role of Osteocalcin and Osteopontin in Fatigue Induced Microdamage Formation and MorphologyO. NIKEL¹, R. A. DAVIGNON¹, C. M. GUNDBERG², AND D. VASHISHTH¹¹Rensselaer Polytechnic Institute, Troy, NY, ²Yale School of Medicine, New Haven, CT**PS-9A-13-167** An Inverse FEA to Assess Bone Fracture Healing in Mice Receiving Mesenchymal Stem Cell TransplantationJ. A. WEIS¹, F. GRANERO-MOLTÓ², T. J. MYERS², A. SPAGNOLI², AND M. I. MIGA¹¹Vanderbilt University, Nashville, TN, ²University of North Carolina at Chapel Hill, Chapel Hill, NC**PS-9A-13-168** The Influence of the Frontal Sinus on Fracture ToleranceJ. CORMIER¹, S. MANOOGIAN¹, J. BISPLINGHOFF², S. ROWSON², A. SANTAGO², C. MCNALLY², J. BOLTE IV³, AND S. DUMA²¹Biodynamic Research, San Antonio, TX, ²Virginia Tech – Wake Forest Center for Injury Biomechanics, Blacksburg, VA, ³The Ohio State University Transportation Research Center, Columbus, OH**PS-9A-13-169T** The Tolerance of the Nasal Bone to Blunt ImpactJ. CORMIER¹, S. MANOOGIAN¹, J. BISPLINGHOFF², S. ROWSON², A. SANTAGO², C. MCNALLY², J. BOLTE IV³, AND S. DUMA²¹Biodynamic Research, San Antonio, TX, ²Virginia Tech – Wake Forest Center for Injury Biomechanics, Blacksburg, VA, ³The Ohio State University Transportation Research Center, Columbus, OH**PS-9A-13-170** Variation of Mineral Crystal Orientation Under Uniaxial Load Using Synchrotron X-Ray ScatteringA. R. PATERSON¹, A. BELZUNG², X. DONG², J. ALMER³, AND X. WANG²¹University of Texas at San Antonio, San Antonio, TX, ²UTSA, San Antonio, TX, ³Argonne 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 MediaF. J. SHEER¹, AND S. GHADIALI¹¹Ohio State University, Columbus, OH**PS-9A-14-172** Real-Time Monitoring of Exercise Induced Changes in Respiratory Resistance Using the Airflow Perturbation DeviceP. CHAPAIN^{1,2}, A. JOHNSON¹, J. VOSSOUGHT², AND S. MAJD²¹University of Maryland College Park, College Park, MD, ²Engineering and Scientific Research Associates, Olney, MD**PS-9A-14-173** In Vivo Detection of Airway Narrowing and Occlusion in Obstructive Sleep Apnea/Hypopnea using UltrasoundM. AL-ABED¹, P. ANTICH², D. E. WATENPAUGH³, G. BHAVE¹, A. BASHABOYINA¹, R. ALEX¹, S. IYER¹, E. ALTUWAJRI¹, AND K. BEHBEHANI¹¹University of Texas at Arlington, Arlington, TX, ²University of Texas Southwestern Medical Center at Dallas, Dallas, TX, ³Sleep Consultants, Inc., Fort Worth, TX**PS-9A-14-174** Odorant Uptake and Transport in the Human Nasal Nose Under Unsteady AirflowJ. JIANG¹, AND K. ZHAO¹¹Monell Chemical Sense Center, Philadelphia, PA**PS-9A-14-175** A Study of Physiological Effects of Sleep Apnea on Cerebral Blood Flow VelocityG. BHAVE¹, D. E. WATENPAUGH², R. ZHANG³, A. BASHABOYINA⁴, M. AL-ABED¹, S. IYER⁵, E. ALTUWAJRI¹, AND K. . BEHBEHANI¹¹The University of Texas, Arlington, Arlington, TX, ²Sleep Consultants Inc., Ft. Worth, TX, ³Presbyterian Hospital, Institute for Exercise and Environmental Medicine, Dallas, TX,**PS-9A-14-176** A Pressure Measuring SyringeJ. SPIEGEL¹¹BIDMC, 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 DataL. BRUMFIELD¹¹NC State University, Raleigh, NC**PS-9A-15-178** Systems Analysis of NoxI Activation by Angiotensin II in Vascular Smooth Muscle CellsW. YIN¹, AND E. O. VOIT¹¹Georgia Institute of Technology, Atlanta, GA**PS-9A-15-179** Modeling of Potassium Accumulation at the Immunological Synapse and its Effect on T-cell FunctionG. MARTIN¹, Y. YUN², AND L. CONFORTI¹¹University of Cincinnati, Cincinnati, OH, ²North Carolina A&T State University, Greensboro, NC

PS-9A-15-180 Design of an Ultrasensitive Activity Assay for Protein-Kinase Signaling NetworksK. J. HOLMBERG¹, AND K. A. JANES¹¹University of Virginia, Charlottesville, VA**PS-9A-15-181** Silver Salts: Effective Antibiotic PotentiatorsJ. R. MORONES-RAMIREZ^{1,2}, AND J. J. COLLINS^{1,2}¹Howard Hughes Medical Institute, Boston, MA, ²Boston University, Boston, MA**PS-9A-15-182** Quantitative Signaling Analysis of Monocyte Differentiation into Osteoclasts or MacrophagesM. O. PLATT¹, AND W. A. LI¹¹Georgia Institute of Technology, Atlanta, GA**PS-9A-15-183** Toward Automated Quantitative Analysis of Macrophage Activation While Retaining Spatial ContextE. HIGHLEY¹, S. Y. KWAN¹, AND P. G. CAMPBELL¹¹Carnegie Mellon University, Pittsburgh, PA**PS-9A-15-184** A Computational Toolbox to Analyze *In-Vitro* Cell Differentiation HeterogeneityE. HIGHLEY¹, E. KER¹, L. E. WEISS¹, AND P. G. CAMPBELL¹¹Carnegie Mellon University, Pittsburgh, PA**PS-9A-15-185** Temporal Changes in ERK1/2 Signaling in Huvecs Cultured on Combinations of ECM ComponentsC. PAUKEN¹, AND M. CAPLAN¹¹Arizona State University, Tempe, AZ**PS-9A-15-186** Spatial Dynamics of TNF- α Induced Hydrogen PeroxideA. F. GARDEZI¹, AND M. L. KEMP²¹Georgia Institute of Technology, Atlanta, GA, ²Georgia Institute of Technology/Emory University, Atlanta, GA**PS-9A-15-187** Serpin-derived Anti-angiogenic Peptides as Therapeutic Agents for Breast CancerJ. E. KOSKIMAKI¹, E. V. ROSCA¹, N. V. PANDEY¹, E. V. KARAGIANNIS¹, AND A. S. POPEL¹¹Johns Hopkins University School of Medicine, Baltimore, MD**PS-9A-15-188** ShReD: A Novel Metric for Determining Reciprocal Interactions Between Biochemical Network ComponentsG. SRIDHARAN¹, D. WEAVER¹, S. HASSOUN¹, AND K. LEE¹¹Tufts University, Medford, MA**Track: Tissue Engineering – PS-9A-16****Biosensors and Tissue Engineering****PS-9A-16-189** Mechanically Directed Endothelial MorphogenesisY. LIU^{1,2}, D. A. MARKOV², J. P. WIKSWO², AND L. J. MCCAWLEY²¹West Virginia University, Morgantown, WV, ²Vanderbilt University, Nashville, TN**PS-9A-16-190** A Wireless Platform for Wound Condition MonitoringY-S. SEO¹, H. CAO¹, S. K. THAKAR¹, C. M. NGUYEN¹, AND J-C. CHIAO¹¹University of Texas at Arlington, Arlington, TX**PS-9A-16-191** *In Vivo* and *In Silico* Validation of a Novel Implantable Oxygen SensorH. V. JAIN¹, H. BYRNE², AND N. I. MOLDOVAN³¹Mathematical Biosciences Institute, The Ohio State University, Columbus, OH, ²School of Mathematical Sciences, University of Nottingham, Nottingham, UK, United Kingdom, ³Davis 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. ABRAHAM¹, R. FEI¹, B. M. CUMMINS¹, M. A. GRUNLAN¹, AND G. L. COTE¹¹Texas A&M University, College Station, TX**PS-9A-16-193** Electrochemical Glucose Biosensor Based on Multi-walled Carbon Nanotubes (MWNTs) Modified Electrode.D. M. SAVANI¹, A. SANTIAGO¹, AND P. PATRA¹¹University 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. CHAN¹, AND D. MOONEY¹¹Harvard University, Cambridge, MA**PS-9A-17-195** Improved Haemocompatibility of Polyethylene Terephthalate Films Modified by NTPDase ImmobilizationV. MUTHUVIJAYAN¹, AND R. S. LEWIS²¹Oklahoma State University, Stillwater, OK, ²Brigham Young University, Provo, UT**PS-9A-17-196** Integrin-Directed Modulation of Macrophage Response to BiomaterialsT. ZAVERI¹, N. DOLGOVA¹, M. CLARE-SALZLER¹, AND B. KESELOWSKY¹¹University of Florida, Gainesville, FL**PS-9A-17-197** Immunogenicity of Bovine and Leporine Meniscus Cells and Articular ChondrocytesJ. SANCHEZ-ADAMS¹, D. J. HUEY¹, V. P. WILLARD¹, AND K. A. ATHANASIOU²¹Rice University, Houston, TX, ²UC Davis, Davis, CA**PS-9A-17-198** Biological Response to Submicron Cobalt Chromium Alloy Particles in a Rabbit ModelM. L. HARPER¹, V. SINGH¹, F. W. CHAN¹, AND N. HALLAB²¹Medtronic, Spinal and Biologics, Memphis, TN, ²Rush 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. CHUNG¹, AND M. N. RYLANDER¹¹Virginia Tech, Blacksburg, VA**PS-9A-18-200** Aligned Collagen-GAG Scaffolds for Tendon Tissue EngineeringS. R. CALIARI¹, M. RAMIREZ¹, AND B. A. HARLEY¹¹University of Illinois at Urbana-Champaign, Urbana, IL**PS-9A-18-201** Skeletal Muscle NanoactuatorK. D. MCKEON-FISCHER¹, D. H. FLAGG¹, AND J. W. FREEMAN¹¹Virginia Polytechnic Institute and State University, Blacksburg, VA**PS-9A-18-202** Force Generation in Engineered Muscle Tissue is Significantly Affected by Cell-matrix InteractionsS. HINDS¹, W. BIAN¹, AND N. BURSAC¹¹Duke University, Durham, NC**PS-9A-18-203** Composite Electrospun/Hydrogel Scaffold for Cartilage Tissue EngineeringL. WRIGHT¹, K. D. MCKEON-FISCHER¹, L. S. NAIR², AND J. W. FREEMAN¹¹Virginia Tech, Blacksburg, VA, ²University of Connecticut, Farmington, CT**PS-9A-18-204** MicroCT Assessment of Bone Organ Culture Viability and Development in a Neonatal Rat Femur ModelK. GURLEY¹, A. GOBIN², AND M. SAUNDERS¹¹University of Kentucky, Lexington, KY, ²University of Louisville, Louisville, KY**PS-9A-18-205** Improved Cell Infiltration into Electrospun Bone Tissue Scaffolds via Sacrificial Fiber RemovalB. WHITED¹, J. WHITNEY¹, Y. XU¹, AND M. N. RYLANDER¹¹Virginia Polytechnic Institute and State University, Blacksburg, VA

PS-9A-18-206 Novel Glucosamine Analogs for Recovery of Chondrocytes from IL-1 TreatmentJ. M. COBURN¹, J. CRIST¹, L. WO¹, K. J. YAREMA¹, AND J. H. ELISSEFF¹¹Johns Hopkins University, Baltimore, MD**PS-9A-18-207** Characterization of Electrospun Osteon-like ScaffoldsT. ANDRIC¹, A. C. SAMPSON¹, AND J. W. FREEMAN¹¹Virginia Tech, Blacksburg, VA**PS-9A-18-208** Synthesis of Collagenase-Sensitive Polyureas for Ligament Tissue EngineeringT. J. TOUCHET¹, H. A. BENHARDT¹, AND E. M. COSGRIFF-HERNANDEZ¹¹Texas A&M University, College Station, TX**PS-9A-18-209** Cartilage Tissue Engineering Using Neonatal Human Dermal FibroblastsM. SINGH¹, F. K. KASPER¹, AND A. G. MIKOS¹¹Rice University, Houston, TX**PS-9A-18-210** Soluble Mini-agrin Increases Contractility of Engineered Skeletal Muscle TissuesW. BIAN¹, AND N. BURSAC¹¹Duke University, Durham, NC**PS-9A-18-211** Histological Sections - Can Major and Minor Centroidal Axes Serve as Absolute Reference PointsS. H. MCBRIDE¹, S. DOLEJS¹, U. KNOTHE², AND M. KNOTHE TATE¹¹Case Western Reserve University, Cleveland, OH, ²Cleveland 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. THOMAS¹, Z. A. SCHILLER¹, C. C. BANOS¹, AND C. K. KUO¹¹Tufts University, Medford, MA**PS-9A-18-213** Prolotherapy Based Increases in Cellular Proliferation and Collagen Deposition in MC3T3-E1 CellsY. M. EMPSON¹, E. C. EKWUEME¹, AND J. W. FREEMAN¹¹Virginia Tech, Blacksburg, VA**PS-9A-18-214** Multivariate Analysis of Microporosity and BMP on Bone Regeneration in Biphasic CaP ScaffoldsS. POLAK¹, S. LAN LEVENGOOD², A. MAKI¹, S. CLARK¹, M. WHEELER¹, AND A. WAGONER JOHNSON¹¹University of Illinois at Urbana-Champaign, Urbana, IL, ²University of Wisconsin, Madison, WI**PS-9A-18-215** Orientation of Collagen Fibers in the ECM of Osteoblastic Cells by Mechanical TransductionJ. A. BOADA¹, J. JEREZ¹, I. DE JESUS¹, J. VALERA¹, R. ROMAÑACH¹, N. DIFFOOT-CARLO¹, AND P. A. SUNDARAM¹¹University of Puerto Rico, Mayaguez, Puerto Rico**PS-9A-18-216** Effect of a Mechanical Stimulation Bioreactor on Tissue Engineered Scaffold-Free CartilageS. TRAN¹, AND S. ELDER¹¹Mississippi State University, Mississippi State, MS**PS-9A-18-217** Highly Cellular Region of Scaffold-Free Engineered Cartilage Fails Under Compressive Shearing LoadsG. WHITNEY¹, K. JAYARAMAN¹, J. E. DENNIS¹, AND J. M. MANSOUR¹¹Case Western Reserve University, Cleveland, OH**PS-9A-18-218** Novel Hydrogels of Photo-Crosslinkable PEG Macromers and Chitosan for Cartilage Tissue EngineeringB. J. KLEIN¹, A. HARLEY¹, AND J. A. COOPER¹¹Rensselaer Polytechnic Institute, Troy, NY**PS-9A-18-219** Synovium-Derived Stem Cells for Cartilage Tissue EngineeringS. R. SAMPAT¹, G. O'CONNELL¹, J. FONG¹, AND C. T. HUNG¹¹Columbia University, New York, NY**PS-9A-18-220** *In Vitro* Evaluation of Magnesium Alloys for the Regeneration of Ligament and Ligament-Bone InterfaceH. LIU¹, Z. XU², AND S. L-Y. WOO¹¹University of Pittsburgh, Pittsburgh, PA, ²North 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. KIM¹, H. LEE¹, AND S. SEO¹¹SungKyunkwan University, Seoul, Seoul, Korea, Republic of**PS-9A-19-222** Computational Prediction of Breast Features after Partial MastectomyD. THANOON¹, M. GARBEY¹, AND B. L. BASS²¹University of Houston, Houston, TX, ²The Methodist Hospital System, Houston, TX**PS-9A-19-223** Comparing the Biomechanical Response of Porcine, Bovine, and Human Liver TissueA. SANTAGO¹, A. KEMPER¹, J. SPARKS², AND S. DUMA¹¹Virginia Tech - Wake Forest School For Biomedical Engineering and Sciences, Blacksburg, VA, ²Virginia 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. CHAPURIN¹, A. NEUMANN¹, N. S. LOR², K. SAYED¹, B. DAVIS³, M. C. GOUDE³, AND J. BUTCHER¹

¹Cornell University, Ithaca, NY, ²East Carolina University, Greenville, NC, ³University of Florida, Gainesville, FL

PS-9B-1-2 Optimization of a Lab-on-chip Sensor for Highly Electronegative Heavy Metals

J. L. HERREN¹, P. JOTHIMUTHU¹, R. WILSON¹, W. R. HEINEMAN¹, AND I. PAPAUSKY¹
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PS-9B-1-3 HOXA1 Regulation of an Athero-susceptible Phenotype in Endothelium

P. ISLAM¹, Y. FANG¹, AND P. F. DAVIES¹
¹University of Pennsylvania, Philadelphia, PA

PS-9B-1-4 Platelet-targeted Liposomal Nanoconstructs for Site-specific Drug Delivery in Vascular Disease

C. MODERY¹, M. RAVIKUMAR¹, AND A. SEN GUPTA¹
¹Case Western Reserve University, Cleveland, OH

PS-9B-1-5 Optimization of Growth of *Gluconobacter* sp. 33 and PQQ-Dependent Enzyme Purification

D. W. STERN¹, AND S. D. MINTTEER²
¹Bucknell University, Lewisburg, PA, ²Saint Louis University, Saint Louis, MO

PS-9B-1-6 A Simple Microfluidic Device for *C. elegans* Immobilization Fabricated Using Household Materials

B. G. WONG¹, O. CINQUIN¹, AND E. E. HUI¹
¹University of California, Irvine, Irvine, CA

PS-9B-1-7 Assessment of Silicate Cross-linked Poly(ethylene oxide) Hydrogels for Orthopedic Tissue Repair

J. CANTER¹, S. A. DAMMU¹, S. VAID¹, A. GAHARWAR¹, AND G. SCHMIDT¹
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PS-9B-1-8 Synthesis of a Biodegradable Methacrylated Ester for Bone Graft Fabrication

C. J. WILSON¹, R. MOGLIA², AND E. COSGRIFF-HERNANDEZ²
¹Texas Lutheran University, Seguin, TX, ²Texas A&M University, College Station, TX

PS-9B-1-9 Cytokine Regulation of CD4 T cell Memory Development

R. A. AMEZQUITA^{1,2}, H. D. MARSHALL³, AND S. M. KAECH³
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PS-9B-1-10 A High Throughput Workflow For The Analysis Of Diaxial Shifts In *Escherichia Coli* In A Paired Carbon Substrate Environment

A. CHAUDHARI¹, N. LEWIS¹, J. LERMAN¹, AND B. PALSSON¹
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PS-9B-1-11 Surface Capture and Imaging of H1N1 Virus

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PS-9B-1-12 Multiphoton Microscopy Histology of Cleared Mouse Organs

S. G. PARRA¹, T. H. CHIA¹, J. P. ZINTER¹, AND M. J. LEVENE¹
¹Yale University, New Haven, CT

PS-9B-1-13 Galectin-I and Human Umbilical Cord Mesenchymal Stromal Cell (HUCMSC) Differentiation *In Vitro*

E. J. LEE¹, L. JING¹, L. A. SETTON^{1,2}, AND J. CHEN¹
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PS-9B-1-14 Assessment of FRET Probes for High-Content Screening of Anti-AIDS Inhibitors

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PS-9B-1-15 Design and Development of a Hemodynamic Pump for Arterial Wall Shear Stress Measurements

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PS-9B-1-16 Phospholipid Composition Affects CLC-ec1 Chloride-transport Activity

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PS-9B-1-17 Thread as a Matrix for Biomedical Assays

R. DASGUPTA¹, M. RECHES¹, AND G. WHITESIDES¹
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PS-9B-1-18 Vinculin Adhesion Strength Regulation of Matrix Stiffness-Induced Stem Cell Differentiation

D. S. VIJAYRAGHAVAN¹, A. W. HOLLE¹, AND A. J. ENGLER¹
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PS-9B-1-19 Design and Implementation of Novel Silicone Cup Attachment for Ambulatory EEG Electrode

S. M. BOST¹, M. A. LONG¹, F. GILLIAM², K. A. BIERYLA¹, AND J. V. TRANQUILLO¹
¹Bucknell University, Lewisburg, PA, ²Geisinger Medical Center, Danville, PA

PS-9B-1-20 Optimization of a Novel Method to Estimate Synovial Fluid Volume

B. J. HINTON¹, B. C. HANSEN², J. P. CAFFREY², AND R. L. SAH²
¹University of Minnesota-Twin Cities, Minneapolis, MN, ²University of California-San Diego, La Jolla, CA

PS-9B-1-21 A Novel Microfluidic Experimental System for Investigating Neutrophil Decision Making in Chemotaxis

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¹Franklin W. Olin College of Engineering, Needham, MA, ²Center for Engineering in Medicine, Massachusetts General Hospital, Charlestown, MA, ³Harvard Medical School, Cambridge, MA

PS-9B-1-22 Stability Characterization of PEG-Conjugated Nanoshells for Improved Passive Tumor Accumulation

L. M. TANENBAUM¹, A. J. COUGHLIN¹, AND J. L. WEST¹
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PS-9B-1-23 MindBot: Robotic Control via Wireless Neural Headset

T. E. LAIRD¹, AND N. L. JOHNSON¹
¹Clemson University, Clemson, SC

PS-9B-1-24 Prediction of Future Glucose Concentrations Using Linear Time-Series Models

L. MARXKORS¹, M. ORUKLU², AND A. CINAR²
¹Saint Louis University, St. Louis, MO, ²Illinois Institute of Technology, Chicago, IL

PS-9B-1-25 Mechanobiology of the Periosteum: Finite Element Modeling and Histological Analysis

R. M. MILLER¹, S. DOLEJS¹, S. H. MCBRIDE¹, U. KNOTHE², AND M. L. KNOTHE TATE¹
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PS-9B-1-26 Cross-linked PEG-poly(amino acid) Nanoassemblies for Controlled Drug Delivery

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¹University of Kentucky, College of Engineering, Lexington, KY, ²University of Kentucky, College of Pharmacy, Lexington, KY

PS = Poster Session
OP = Oral Presentation

PS-9B-I-27 Pentablock Copolymers for Sustained Gene DeliveryM. Q. FLEMING¹, B. ZHANG², AND S. MALLAPRAGADA²¹University of Texas at Austin, Austin, TX, ²Iowa State University, Ames, IA**PS-9B-I-28** Functionalized Macrocycles: A Journey toward a New Class of Insulin MimeticsV. RAMBARAN¹, C. RAMKISSOON², AND K. MUNGAL²¹The University of Trinidad and Tobago, Arima, Trinidad and Tobago, ²University of Trinidad and Tobago, Arima, Trinidad and Tobago**PS-9B-I-29** Effect of Cryopreservation on Periosteal TissueS. EVANS¹, S. MCBRIDE¹, AND M. L. KNOTHE TATE¹¹Case Western Reserve University, Cleveland, OH**PS-9B-I-30** Development of Eye Injury Risk Functions for Multiple Projectile Diameters using the FOCUS HeadformR. CHAKLADER¹, E. THIEL¹, AND E. KENNEDY¹¹Bucknell 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. CARLSGAARD¹, B. P. RAJWA¹, N. R. LEWIS¹, V. P. PATSEKIN¹, C. M. HOLDMAN¹, K. E. RAGHEB¹, P. RIGBY¹, D. KRAMER¹, AND J. P. ROBINSON¹¹Purdue University, West Lafayette, IN**PS-9B-I-32** Influence of Cell-Substrate Chemistry on Stem Cell Adhesion Using Novel TIRF MicroscopeD. CARLIN¹, S. RAMACHANDRAN², S. VARGHESE², AND R. LAL²¹California Polytechnic State University San Luis Obispo, San Luis Obispo, CA, ²University 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. PITRE¹, E. YAMAGUCHI¹, B. J. SMITH¹, O. FOROUZAN¹, S. S. SHEVKOPLYAS¹, AND D. P. GAVER, III¹¹Tulane University, New Orleans, LA**PS-9B-I-34** Computational Insight on the Influence of Subunit Packing on the Thermostability of Lactate OxidaseN. J. HAMS¹, L. PENG², AND D. GOUGH²¹University of Missouri - Columbia, Columbia, MO, ²University of California - San Diego, La Jolla, CA**PS-9B-I-35** Computational Study of Infarct Reinforcement and Its Impact on Left Ventricular FunctionJ. R. MACDANGDANG¹, J. W. HOLMES¹, AND G. M. FOMOVSKY¹¹University of Virginia, Charlottesville, VA**PS-9B-I-36** Improvement of Registration of 2D X-ray Mammograms and 3D Speed of Sound ImagesJ. BONN^{1,2}, T. HOPP¹, N. RUITER¹, AND N. DURIC³¹Karlsruhe Institute of Technology, Karlsruhe, Baden-Württemberg, Germany, ²University of Cincinnati, Cincinnati, OH, ³Barbara Ann Karmanos Cancer Institute, Detroit, MI**PS-9B-I-37** An Investigation into Sex-related Differences in Pulmonary HemodynamicsR. H. CLAYMAN¹, A. ROLDAN¹, AND N. C. CHESLER¹¹University of Wisconsin, Madison, WI**PS-9B-I-38** Study of Biopolymer Tissue Scaffold DegradationE. MCMULLIN¹, AND K. C. YAN¹¹The College of New Jersey, Ewing, NJ**PS-9B-I-39** Study of Heart Tissue Damage via Dynamic Heart PhantomM. McDONOUGH¹, AND K. C. YAN¹¹The College of New Jersey, Ewing, NJ**PS-9B-I-40** Pressure-Area Relationship of the Carpal Tunnel: A Cadaveric StudyT. L. MASTERS¹, T. A. MONDELLO¹, AND Z-M. LI¹¹Cleveland Clinic, Cleveland, OH**PS-9B-I-41** Promoting Peripheral Nerve Repair Using Basement Membrane-Polycaprolactone Nanofiber ScaffoldsD. ABEYAYEHU¹, R. A. NEAL¹, AND E. BOTCHWEY¹¹U. of Virginia, Charlottesville, VA**PS-9B-I-42** Droplet Based Microfluidics for Single Cell Genetic AnalysisR. J. KIMMERLING¹, T. BAKOWSKI¹, AND H. STREY¹¹Stony Brook University, Stony Brook, NY**PS-9B-I-43** Immobilization of Trypsin in a PDMS Channel for Protein Digestion and AnalysisT. LOCKE¹, C. GOODWIN¹, C. MARASCO¹, J. WIKSWO¹, AND J. MCLEAN¹¹Vanderbilt 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. AKSELRAD¹, M. IRVIN¹, P. SAMSON¹, A. POZZI¹, AND J. WIKSWO¹¹Vanderbilt University, Nashville, TN**PS-9B-I-45** Development of an Inexpensive Device for Non-contact Measurement of Skin TemperatureS. E. NAYLOR¹, D. NELSON¹, AND S. LEAVESLEY¹¹University 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. PENG¹, J. C. SUNSHINE², AND J. J. GREEN²¹Johns Hopkins University, Baltimore, MD, ²Johns Hopkins University School of Medicine, Baltimore, MD**PS-9B-I-47** Self-Cleaning Micropatterned Nanocomposite HydrogelsJ. T. GEORGE¹, R. FEI¹, A. HAN¹, M. S. HAHN¹, AND M. A. GRUNLAN¹¹Texas A&M University, College Station, TX**PS-9B-I-48** Quantifying the Effects of Cerebrospinal Fluid Pulsations on Intrathecal Drug DeliveryT. J. HARRIS¹, Y. HSU¹, M. HETTIARACHCHI¹, AND A. LINNINGER¹¹University 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. ZHANG¹, J. CHEN¹, AND S. WANG¹¹The City College Of New York / CUNY, New York, NY**PS-9B-I-50** Stabilization of Enzymes via Binding to PeptidesA. PRASAD^{1,2}, J. FU^{1,3}, AND N. WOODBURY^{1,3}¹The Biodesign Institute at Arizona State University, Tempe, AZ, ²Ira A. Fulton School of Engineering at Arizona State University, Tempe, AZ, ³College of Liberal Arts and Sciences at Arizona State University, Tempe, AZ**PS-9B-I-51** PDMSstar-PEG Hydrogels as Tissue Engineering ScaffoldsK. HUI¹, B. M. BAILEY¹, AND M. A. GRUNLAN¹¹Texas A&M University, College Station, TX**PS-9B-I-52** Development of a Microfluidic Platform for Neural Stem Cell Differentiation and ProliferationS. DRIA¹, I. YANG¹, N. THAKOR¹, AND A. NATH¹¹Johns Hopkins University, Baltimore, MD**PS-9B-I-53** Developing New Expansion and Differentiation Media for Human Adipose Tissue-derived Mesenchymal Stem CellsK. KATHIRIA^{1,2}, D. WAGNER², AND H. WEISS²¹Florida International University, Miami, FL, ²University of Notre Dame, Notre Dame, IN**PS-9B-I-54** Generation of Predictive Models for Anti-Proliferative Drug Release from a Biodegradable ElastomerA. L. PELINESCU¹, Y. HONG^{1,2}, AND W. R. WAGNER^{1,2}¹University of Pittsburgh, Pittsburgh, PA, ²McGowan Institute for Regenerative Medicine, Pittsburgh, PA**PS-9B-I-55** The Use of Quantum Dots for Labeling Neural Cell LinesM. SMYTH¹, R. WILLITS², AND A. HARKINS³¹Vanderbilt University, Nashville, TN, ²University of Akron, Akron, OH, ³Saint Louis University, St. Louis, MO

PS-9B-I-56 Localized and Automated Chemical and Oxygen Delivery System for Microfluidic Brain Slice DevicesG. J. YU¹, A. BLAKE², AND D. EDDINGTON²¹University of Illinois at Urbana-Champaign, Urbana, IL, ²University of Illinois at Chicago, Chicago, IL**PS-9B-I-57** Effects of Cyclic Stretch on Expression of Pro-Inflammatory GenesS. VANDERZYL¹, H.-J. HSU¹, A. W. ORR², AND R. KAUNAS¹¹Texas A&M University, College Station, TX, ²LSU Health Sciences Center - Shreveport, Shreveport, LA**PS-9B-I-58** Deficiencies in Mechanical Properties of Peripheral Nerves in Fibrillin-2 Knockout MiceD. REDMOND-WHITE¹, R. STAHL², D. CAREY², AND D. M. EBENSTEIN¹¹Bucknell University, Lewisburg, PA, ²Weis 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. KABANI¹, C. MARASCO¹, AND J. WIKSWO¹¹Vanderbilt University, Nashville, TN**PS-9B-I-60** A Novel Nanoparticle-Enhanced Biophysical Stimulus for Bone Tissue EngineeringY. TALUKDAR¹, K. SCHAEFER¹, P. AVTI¹, J. P. LONGTIN¹, AND B. SITHARAMAN¹¹State University of New York at Stony Brook, Stony Brook, NY**PS-9B-I-61** Fabricating Biodegradable Paclitaxel-Loaded Spheroidal Microparticles for Drug Delivery ApplicationsO. SHEMI¹, M. HESLINGA², AND O. ENIOLA-ADEFESO²¹University of Maryland, Baltimore County, Catonsville, MD, ²University of Michigan, Ann Arbor, MI**PS-9B-I-62** A Novel Method to Create Macrochannels in Three-Dimensional Hydrogels for Enhanced Cell ProliferationJ. W. KIM¹, AND B. M. WU¹¹University of California, Los Angeles, Los Angeles, CA**PS-9B-I-63** Mechanical Contribution of Smooth Muscle Cells in Large Elastic ArteriesB. CORLEY¹, V. LE¹, AND J. WAGENSEIL¹¹Saint 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. OSTROWSKI¹, J. ENDERS¹, C. GOODWIN¹, C. MARASCO¹, K. T. SEALE¹, J. MCLEAN¹, AND J. WIKSWO¹¹Vanderbilt University, Nashville, TN**PS-9B-I-65** Mapping Local Strains in *Mytilus edulis* Bysal ThreadsN. KO¹, AND D. M. EBENSTEIN¹¹Bucknell University, Lewisburg, PA**PS-9B-I-66** Characterization and Optimization of Enzymatically-Degradable Microgels for Pulmonary Drug DeliveryA. E. BERGERON¹, P. WANAKULE¹, AND K. ROY¹¹The University of Texas at Austin, Austin, TX**PS-9B-I-67** Aspirin Inhibits Activation of Aortic Valve Endothelial Cells by Angiotensin IIA. RUHL¹, C. MCINTOSH¹, AND J. N. WARNOCK¹¹Mississippi State University, Mississippi State, MS**PS-9B-I-68** Analyzing Immune Effects of Staphylococcal Enterotoxin B in a Microfluidic-Ion Mobility-Mass Spectrometer PlatformA. GARZA¹, C. MARASCO¹, C. GOODWIN¹, J. ENDERS¹, K. SEALE¹, J. MCLEAN¹, AND J. WIKSWO¹¹Vanderbilt University, Nashville, TN**PS-9B-I-69** Effect of Cell-matrix Interface on Organization and Myogenic Differentiation of Stem CellsS. VARGHESE¹, R. POWERS¹, A. AUNG¹, M. GADDE¹, AND S. SHROFF¹¹University of California, San Diego, La Jolla, CA**PS-9B-I-70** Real-time Monitoring of -Factor Induced Mating Response in *S. cerevisiae* SecretomesA. KOLE¹, E. CURTIS¹, B. NGUYEN², J. ENDERS¹, T. GRAHAM¹, K. SEALE¹, J. MCLEAN¹, AND J. WIKSWO¹¹Vanderbilt University, Nashville, TN, ²Belmont University, Nashville, TN**PS-9B-I-71** Investigation of CEACAM1 Dynamics by Single Cell ImagingL. POLONI¹, AND C. M. YIP^{2,3}¹Division of Engineering Science, University of Toronto, Toronto, Ontario, Canada, ²Institute of Biomaterials and Biomedical Engineering, University of Toronto, Toronto, Ontario, Canada, ³Department 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. RAJGARIAH¹, R. M. OLABISI², C. L. SIMPSON², AND J. L. WEST²¹Duke University, Durham, NC, ²Rice University, Houston, TX**PS-9B-I-73** Decellularized Lipoaspirate as a Naturally-Derived Scaffold for Adipose Tissue EngineeringD. O. IBRAHIM¹, A. YOUNG¹, AND K. L. CHRISTMAN¹¹UCSD, La Jolla, CA**PS-9B-I-74** Studies on Cardiomyocyte Health and Embryonic Stem Cell Differentiation Within a Microfluidic PlatformC. ALLAMNENI¹, S. FALEY², AND A. HATZOPOULOS³¹Vanderbilt University, Searle SyBBURE Program, Nashville, TN, ²Vanderbilt University Department of Cardiovascular Medicine, Nashville, TN, ³Vanderbilt University Department of Cardiovascular Medicine, Nashville, TN**PS-9B-I-75** Effect of Varying PLGA Molecular Weight Blends on Small-Molecule Drug ReleaseA. OLEAR¹, L. SOLORIO¹, J. HAMILTON², AND A. EXNER¹¹Case Western Reserve University, Cleveland, OH, ²Johns Hopkins University, Baltimore, MD**PS-9B-I-76** Bone and Cartilage Compensation in Response to Diet-Induced ObesityA. H. TSOI¹, M. E. BOTROS¹, E. M. FIEVISOHN¹, M. E. CHAN¹, AND C. T. RUBIN¹¹Stony Brook University, Stony Brook, NY**PS-9B-I-77** Local Schwann Cell-Produced Extracellular Matrix Can Direct Local Neurite OutgrowthA. L. MCGREGOR¹, A. M. SEGGIO¹, AND D. M. THOMPSON¹¹Rensselaer Polytechnic Institute, Troy, NY**PS-9B-I-78** Designing Synapse Morphometry Tools for the Drosophila Brain Connectome ProjectA. L. MCGREGOR^{1,2}, P. K. RIVLIN², AND L. K. SCHEFFER²¹Rensselaer Polytechnic Institute, Troy, NY, ²Janelia Farm Research Campus, Howard Hughes Medical Institute, Ashburn, VA**PS-9B-I-79** Development of Semi-Automated Algorithm for Bone Marrow Adiposity MeasurementM. BOTROS¹, A. TSOI¹, E. FIEVISOHN¹, E. CHAN¹, AND C. RUBIN¹¹Stony Brook University, Stony Brook, NY**PS-9B-I-80** Toward Understanding Nitric Oxide Release in Lymphatic Endothelial CellsK. NIXON¹, AND M. FROST¹¹Michigan Tech, Houghton, MI**PS-9B-I-81** Regeneration of Periosteum in Denuded BoneM. YU¹, U. KNOTHE², AND M. KNOTHE TATE¹¹Case Western Reserve University, Cleveland, OH, ²Cleveland Clinic Foundation, Cleveland, OH

PS-9B-I-82 Poly Lactic-co-Glycolic Acid Carbon Nanofiber Materials for Cardiac Patch ApplicationsD. A. STOUT^{1,2}, AND T. J. WEBSTER¹¹Brown University, Providence, RI, ²California State University, Long Beach, CA**PS-9B-I-83 Single Pore System for Classification of Cells**R. A. KHAN¹, W. ASGHAR², Y. WAN³, AND S. M. IQBAL⁴¹Department of Electrical Engineering, Honors College, University of Texas at Arlington, Arlington, TX, ²Department of Electrical Engineering, NanoFab, University of Texas Arlington, Arlington, TX, ³Department of Bioengineering, NanoFab, University of Texas Arlington, Arlington, TX, ⁴University of Texas Arlington, Arlington, TX**PS-9B-I-84 Geometrical Effects of Flow Chambers on Chemokine Secreting Cancer Cells**P. DELNERO¹, J. TEO², U. HAESSLER², AND M. SWARTZ²¹Vanderbilt University, Nashville, TN, ²École Polytechnique Fédérale de Lausanne (EPFL), Lausanne, Switzerland**PS-9B-I-85 Quantifying Elastin and Collagen in Developing Mouse Arteries**A. WEBSTER¹, V. LE², AND J. WAGENSEIL²¹University of Wisconsin, Madison, WI, ²Saint Louis University, St. Louis, MO**PS-9B-I-86 The Salifier: A New Device for Saliva Collection from Infants for DNA Analysis**E. FRANZ¹, G. BOON III¹, G. GERHARD², J. BAISH¹, AND D. EBENSTEIN¹¹Bucknell University, Lewisburg, PA, ²Weis 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^{1,2}, L. MCCAWLEY^{1,2}, D. MARKOV¹, AND S. GARBETT²¹Vanderbilt Institute for Integrative Biosystems Research and Education (VIIBRE), Nashville, TN, ²Department 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. MULCAHY¹, M. AMIN², AND J. WAGENSEIL²¹University of Minnesota, Minneapolis, MN, ²Saint Louis University, St. Louis, MO**PS-9B-I-89 Mechanisms Governing Vascular Endothelium under Pulsatile and Oscillatory Conditions**M. SOSA¹, P. VANDRANGI¹, AND V. RODGERS¹¹University of California Riverside, Riverside, CA**PS-9B-I-90 A Polymeric siRNA Delivery System to Induce Differentiation in hMSCs**M. E. BOUTIN¹, AND D. S. BENOIT¹¹University of Rochester, Rochester, NY**PS-9B-I-91 Constructing a Realistic Brain phantom to Validate the Independent Component Analysis of EEG Data**T. G. HARVEY¹, B. DEAN², AND D. DEAN²¹South Carolina Governor's School for Science and Mathematics, Hartsville, SC, ²Clemson University, Clemson, SC**PS-9B-I-92 Mechanical Properties of Mesenchymal Cells during Vascular Smooth Muscle Cell Differentiation**M. M. TONEY¹, A. LINDBURG¹, AND D. DEAN¹¹Clemson University, Clemson, SC**PS-9B-I-93 High-speed Scanning Control Algorithms for MEMS-based Confocal Image Acquisition**M. RAJ¹, Y. WANG¹, AND J. X. ZHANG¹¹The University of Texas at Austin, Austin, TX**PS-9B-I-94 Direct Measurements of Nanoparticle and Cell Interactions using Atomic Force Microscopy**L. M. IKONOMOV¹, W. MCALLISTER², AND D. DEAN²¹Southside High School Center for International Studies, Greenville, SC, ²Clemson University, Clemson, SC**PS-9B-I-95 Effect of X-Ray on Porcine Articular Cartilage Biomechanics**H. ROBERTS¹, A. LINDBURG², AND D. DEAN²¹South Carolina State University, Orangeburg, SC, ²Clemson University, Clemson, SC**PS-9B-I-96 Effects of Ibotenic Acid Lesions of the Globus Pallidus on Sleep in the Rat**K. DZURISIN¹, D. W. BARNETT², AND A. M. ANCH²¹University of Akron, Parma, OH, ²Saint 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. KESWANI¹, J. E. SAIK¹, AND J. L. WEST¹¹Rice University, Houston, TX**PS-9B-I-98 Specificity and Safety of Drug (4-phenylbutyrate) Action in Cardiac Tissue**J. E. GUNTHER¹, Z. JIA¹, AND E. ENTCEVA¹¹Stony Brook University, Stony Brook, NY**PS-9B-I-99 Measuring Periosteal Permeability in Frozen and Fresh Tibiae**X. ZHEN¹, AND M. L. KNOTHE TATE²¹Worcester Polytechnic Institute, Worcester, MA, ²Case 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. OLSOVSKY¹, M. A. SALDUA¹, AND K. C. MAITLAND¹¹Texas A&M University, College Station, TX**PS-9B-I-102 Determining the Mechanical Role of Elastin and Collagen in Mouse Carotid Arteries**E. MARIN¹, AND J. WAGENSEIL¹¹Saint Louis University, St. Louis, MO**PS-9B-I-103 Quantitative Live Imaging of Avian Embryonic Morphogenesis via Micro-Computed Tomography**A. L. HENNING¹, M. X. JIANG¹, T. KAUSHIK¹, M. RICCIO¹, C. SCHAFFER¹, M. JIN¹, AND J. T. BUTCHER¹¹Cornell University, Ithaca, NY**PS-9B-I-104 Scanning System Design and Synchronization for a Two-Photon and SHG Hybrid Confocal Microscope**L. SCHMIDT¹, Y. SHAO², R. WANG¹, H. LIU¹, AND B. GAO¹¹Clemson University, Clemson, SC, ²Shenzhen University, Shenzhen, Guangdong, China, People's Republic of**PS-9B-I-105 Developing a Glucose Biosensor for Monitoring Patients with Brain Injuries**L. WILES¹, M. ROGERS², AND M. BOUTELLE²¹Clemson University, Clemson, SC, ²Imperial College London, London, United Kingdom**PS-9B-I-106 On-chip analysis of -factor induced mating response in *S. cerevisiae***E. CURTIS¹, A. KOLE¹, B. NGUYEN², J. ENDERS¹, T. GRAHAM¹, K. SEALE¹, J. MCLEAN¹, AND J. WIKSWO¹¹Vanderbilt University, Nashville, TN, ²Belmont University, Nashville, TN**PS-9B-I-107 Novel Noninvasive Technique for Measurement of Change in Interstitial Fluid Volume**J. C. VO¹, J. M. BARBA¹, Q. T. NGUYEN¹, R. M. DONGAONKAR¹, R. H. STEWART¹, G. A. LAINE¹, AND C. M. QUICK¹¹Michael 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. THOMPSON¹, V. NGASSAM², A. N. PARIKH², AND A. E. OLIVER²¹Rice University, Houston, TX, ²University of California, Davis, CA**PS-9B-I-109 Biodegradable Microparticle-Mediated Delivery of PAX3 Protein to Induce Myogenic Differentiation of Stem Cells**L. LIU¹, C-W. CHANG¹, AND S. VARGHESE¹¹University 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. BOGDANOWICZ¹, B. BEHAN¹, D. DEWITT¹, A. KOPPEL¹, AND D. THOMPSON¹
¹Rensselaer Polytechnic Institute, Troy, NY**PS-9B-I-111** Structure Based Design for Ultra Fast Acting Insulin AnalysisM. WEISS¹, V. RAMANUJAM², AND V. PANDAYARAJAN¹
¹Case Western Reserve, Cleveland, OH, ²Case Western Reserve, South Euclid, OH**PS-9B-I-112** Mechanisms Underlying Collective Cell Migration in VitroK. SUMMERS¹, M. BINDSCHADLER¹, H. CHUNG¹, B. NEHILLA¹, AND J. MCGRATH¹
¹University of Rochester, Rochester, NY**PS-9B-I-113** Diagnostic Peptide-nanoparticle Probes for Multiplexed Profiling of Tumor Protease ActivityG. A. KWONG¹, G. VON MALTZAHN¹, O. ABUDAYYEH¹, S. MO¹, G. MURUGAPPAN¹, I. PAPAYANNOPOULOS¹, AND S. N. BHATIA^{1,2}
¹Massachusetts Institute of Technology, Cambridge, MA, ²Howard Hughes Medical Institute, Cambridge, MA**PS-9B-I-114** Design of a High Volumetric Mixer for a Continuous Microformulator DeviceW. J. MATLOFF¹, J. SCHERRER¹, R. REISERER¹, K. SEALE¹, AND J. WIKSWO¹
¹Vanderbilt University, Nashville, TN**PS-9B-I-115** VASP Negatively Regulates Breast Cancer Cell Motility Utilizing Profilin ID. GAU¹, Z. DING¹, C. BATY¹, AND P. ROY¹
¹University of Pittsburgh, Pittsburgh, PA**PS-9B-I-116** Improving Clinical Balance Measures in Older Adults via Wii Fit TrainingN. M. DOLD¹, AND K. A. BIERYLA¹
¹Bucknell 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. BURKHOLDER¹, AND D. HOU²
¹Bucknell University, Lewisburg, PA, ²Saint Josephs Translational Research Institute, Atlanta, GA**PS-9B-I-118T** Studying the Effects of Endothelial Progenitor Cells Upon Cardiomyocytes in a Microfluidic PlatformR. KORMAN¹, S. FALEY¹, K. SEALE¹, AND A. HATZOPOULOS¹
¹Vanderbilt University, Nashville, TN**PS-9B-I-119** Characterization of Graft Copolymers that Augment Delivery of Antisense OligodeoxynucleotidesR. CHOU¹, L. PEDDADA², AND C. ROTH²
¹University of Texas at Austin, Austin, TX, ²Rutgers University, Piscataway, NJ**PS-9B-I-120** Development of pH-Responsive Nanoparticles for Targeted, Controlled Release of 5-FluorouracilR. L. SCHEUERLE¹, M. C. MOORE¹, AND N. A. PEPPAS¹
¹The 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. FONG¹, S. K. ALFORD¹, S. R. PEYTON¹, AND D. A. LAUFFENBURGER¹
¹Massachusetts Institute of Technology, Cambridge, MA**PS-9B-I-122** In Vitro Characterization of Polysialic Acid Glycomimetics Immobilized on Collagen ScaffoldsI. J. PERRON¹, S. MASAND¹, AND D. I. SHREIBER¹
¹Rutgers University, Piscataway, NJ**PS-9B-I-123** Simulated Overcrowding Extrudes Live Cells from an EpitheliumP. D. LOFTUS¹, G. T. EISENHOFER², AND J. ROSENBLATT²
¹University of Utah, Salt Lake City, UT, ²Huntsman Cancer Institute, Salt Lake City, UT**PS-9B-I-124** Ultrasonic Nebulization as a Tool for Creating Multilayered, Multi-component Anti-Infective NanocoatingsM. COWDERY¹, K. MCNAMARA², Y. LVOV², AND D. MILLS²
¹University of Puget Sound, Tacoma, WA, ²Louisiana Tech University, Ruston, LA**PS-9B-I-125** The Effect of Pluronic and Hyperthermia on Cancer Cell PermeabilityJ. D. HUANG¹, AND A. EXNER²
¹University Hospitals Case Medical Center, Shaker Heights, OH, ²University Hospitals Case Medical Center, Cleveland, OH**PS-9B-I-126** The Use of Magnetic Nanoparticles for Antibacterial Properties and Increasing Osteoblast FunctionsJ. YOO¹, H. F. TROSS¹, E. N. TAYLOR¹, AND T. J. WEBSTER¹
¹Brown University, Providence, RI**PS-9B-I-127** The Inhibitory Effects of Magnetite Nanoparticles on Amyloid-beta Protein Fibril Formation in Alzheimer's DiseaseS. E. CHASTAIN¹, D. SOTO-ORTEGA², M. A. MOSS², J. MANGUAL², AND J. RITTER²
¹Newberry College, Newberry, SC, ²University of South Carolina, Columbia, SC**PS-9B-I-28** A Novel Multichannel Telemetric System for Recording ECoG Activities in Freely Behaving AnimalsP. G. MCCORKLE¹, A. FARAJIDAVAR¹, T. W. WIGGINS¹, AND J.-C. CHIAO¹
¹University of Texas at Arlington, Arlington, TX**PS-9B-I-129** Assembly of Mirrored Pyramidal Wells and Their Application with MicroscopyL. QU¹, K. QIN¹, R. REISEIRER², G. WRIGHT², AND C. JANETOPOULOS²
¹Vanderbilt University, Nashville, TN, ²Vanderbilt, Nashville, TN**PS-9B-I-130** Differentiation of Mouse Embryonic Stem Cells in Stirred Tank and Rotary Wall BioreactorsR. AMBLER¹, K. FRIDLEY¹, I. FERNANDEZ¹, AND K. ROY¹
¹University of Texas at Austin, Austin, TX**PS-9B-I-131** Role of Simvastatin Treatment on Epithelial Cell Injury During Cyclic Airway ReopeningG. EICKERT¹, AND S. GHADIALI¹
¹The Ohio State University, Columbus, OH**PS-9B-I-132** Controlled Release of Biomolecules From Silica Sol-gel Thin FilmsS. VAIDYANATHAN¹, S. SOMMAKIA¹, J. L. RICKUS¹, AND K. J. OTTO¹
¹Purdue University, West Lafayette, IN**PS-9B-I-133** Osteoblastic Response to Bioactive NanocoatingsK. MCNAMARA¹, M. COWDERY², Y. LVOV¹, AND D. MILLS¹
¹Louisiana Tech University, Ruston, LA, ²University of Puget Sound, Tacoma, WA**PS-9B-I-134** Using Synthesized Porous Membranes to Induce Electroosmosis for Cell InjectionZ. W. JOHNSON¹, P. HOBLITZELL², X. SUN³, B. HINDS³, AND K. ANDERSON³
¹Valparaiso University, Valparaiso, IN, ²University of Louisville, Louisville, KY, ³University of Kentucky, Lexington, KY**PS-9B-I-135** Leukocyte Separation Using Cross Flow in a Microfluidic DeviceE. M. WERNER¹, C. MARASCO¹, AND K. T. SEALE¹
¹Vanderbilt University, Nashville, TN**PS-9B-I-136** Areal Strain of Giant Unilamellar Vesicles in a Magnetic Force TransducerS. STRAIN^{1,2}, D. STARK¹, AND R. RAPHAEL¹
¹Rice University, Houston, TX, ²University of Texas, Austin, TX

PS-9B-I-137 Pancreatic Digestive Enzymes Activity in the Ischemic IntestineH. TAM¹, M. CHANG², AND G. W. SCHMID-SCHÖNBEIN²¹Rose Hulman, Terre Haute, IN, ²University of California San Diego, La Jolla, CA**PS-9B-I-138** Patient Specific Biomechanics Models of Surgical Ventricular Reconstruction SurgeryS. J. LIVNE¹, A. MCCULLOCH², AND D. HUNT²¹Tufts University, Medford, MA, ²UCSD, La Jolla, CA**PS-9B-I-139** Nanoscale Surface Modification of the Skin-Implant Interface to Enhance Keratinocyte AttachmentS. MATTESSICH¹, C. TING¹, I. IVANOV¹, A. KHAING¹, T. CAMESANO¹, C. LAMBERT¹, W. MCGIMPSEY¹, AND G. PINS¹¹Worcester 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-ACUÑA¹, E. J. HOWARD², AND J. H. OMENS²¹University of Puerto Rico, Mayagüez Campus, Mayagüez, PR, Puerto Rico, ²University of California, San Diego, CA**PS-9B-I-141** Design and Initial Performance of a Dedicated Cone-Beam CT Scanner for Musculoskeletal ExtremitiesY. DING¹, W. ZBIJEWSKI¹, P. DEJEAN¹, P. PRAKASH¹, J. W. STAYMAN¹, N. PACKARD², R. SENN², D. YANG², J. YORKSTON², A. MACHADO¹, J. CARRINO¹, AND J. H. SIEWERDSEN¹¹Johns Hopkins University, Baltimore, MD, ²Carestream Health Inc., Rochester, NY**PS-9B-I-142** Collagen-binding Peptidoglycan's Influence on Fibrillogenesis & MechanicsA. K. RAMASWAMY¹, J. PADERI¹, K. STUART¹, AND A. PANITCH¹¹Purdue University, West Lafayette, IN**PS-9B-I-143** Quantifying Protein Kinase-Specific Phosphatase ActivityA. K. BOSE¹, K. HOLMBERG¹, AND K. JANES¹¹University of Virginia, Charlottesville, VA**PS-9B-I-144** Decoupling PEG Hydrogel Modulus and Mesh Size Toward Rational Scaffold DesignB. GRIGORYAN¹, D. MUNOZ-PINTO¹, AND M. HAHN¹¹Texas 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. SADEGHI¹, D. A. MARKOV¹, AND L. J. MCCAWLEY²¹Vanderbilt University, Nashville, TN, ²Vanderbilt University Medical Center, Nashville, TN**PS-9B-I-146** The Effect of Media Dilution on Cell Growth Rate in *Saccharomyces cerevisiae*K. J. ROTH¹, K. SEALE¹, AND T. GRAHAM¹¹Vanderbilt University, Nashville, TN**PS-9B-I-147** Low Intensity NIR Light Treatment for Attenuating Oxidative Stress induced by Amyloid Beta PeptideB. L. BUNGART¹, AND J. LEE¹¹University of Missouri, Columbia, MO**PS-9B-I-148** Development of Polymeric Microcapsules for Neural Stem Cell Culture and Tissue EngineeringK. L. BRIGGS¹, C. B. HIGHLEY¹, S. H. BAKHRU¹, AND S. ZAPPE¹¹Carnegie Mellon University, Pittsburgh, PA**PS-9B-I-149** Design and Optimization of a Diffusion-based Microfluidic Blood Filtration DeviceB. REINEMUND¹, M. BENEFORD¹, S. HONG¹, J. KAMEOKA¹, AND G. COTE¹¹Texas A&M University, College Station, TX**PS-9B-I-150** A Novel Method for Measuring the Micromechanics of Soft Tissue using Digital Image CorrelationD. LEE¹, M. MCDONOUGH¹, M. PALIWAL¹, AND K. YAN¹¹The 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-MIRANDA¹, AND F. TIAN²¹University of Puerto Rico at Mayaguez, Toa Baja, PR, ²Penn State College of Medicine, Hershey, PA**PS-9B-I-152** Investigation of the Effect of Cement Viscosity in TKA using Digital Image CorrelationK. ABBRUZZESE¹, R. O'LAUGHLIN¹, D. LEE¹, M. PALIWAL¹, AND D. G. ALLAN²¹The College of New Jersey, Ewing, NJ, ²SIU School of Medicine, Springfield, IL**PS-9B-I-153** Building Mathematical Models for Nanoparticle-Induced Reactive Oxygen Species ProductionP. A. SMITH¹, I. IVANOV¹, AND C. M. SAYES¹¹Texas A&M University, College Station, TX**PS-9B-I-154** Drugs Effect on the Dynamics of Stress Fiber Orientation under Cyclic StretchC. M. HAASE¹, C-F. LEE¹, M. ARCHIBONG², AND R. R. KAUNAS¹¹Texas A&M University, College Station, TX, ²University of Florida, Tallahassee, FL**PS-9B-I-155** Young's Modulus of Multipotent Stem Cells from Different Age GroupsH. S. CHEUNG¹, N. ZIEBARTH¹, J. P. RUIZ¹, AND D. PELAEZ¹¹University 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^{1,2}, D. W. CHEW^{1,2}, A. XAVIER^{1,2}, D. CLEARY^{1,2}, J. MUTHU^{1,2}, AND D. A. VORP^{1,2}¹University of Pittsburgh, Pittsburgh, PA, ²McGowan Institute for Regenerative Medicine, Pittsburgh, PA**PS-9B-I-157** The Effects of Proton Radiation on UHMWPE Material Properties for Total Joint ReplacementsC. S. CUMMINGS¹, E. M. LUCAS¹, T. M. KIEU¹, J. A. MARRO¹, AND J. D. DESJARDINS¹¹Clemson University, Clemson, SC**PS-9B-I-158** Re-design of a Mold for Cellular Aggregation to Create Smooth Muscle Tissue RingsB. ALPHONSE¹, T. GWYTHYER², J. HU², AND M. W. ROLLE²¹University of Rhode Island, Kingston, RI, ²Worcester Polytechnic Institute, Worcester, MA**PS-9B-I-159** Visualizing the Complex 3D Geometry of the Border Zone in Isolated Rabbit HeartS. VELAMAKANNI¹, R. M. SMITH¹, A. BLACK¹, T. AKKIN¹, AND E. G. TOLKACHEVA¹¹University of Minnesota, Minneapolis, MN**PS-9B-I-160** A Protective Sheath for Stem Cell Delivery to the HeartK. M. VAZQUEZ¹, N. DUFFY¹, J. GUYETTE¹, M. D. PHANEUF², S. G. PATHAN², S. M. ALI², AND G. R. GAUDETTE¹¹Worcester Polytechnic Institute, Worcester, MA, ²BioSurface Inc, Ashland, MA**PS-9B-I-161** Distance Measurements for Automated High-Throughput Compound ScreeningN. R. LEWIS¹, J. ROBINSON¹, V. DAVISSON¹, V. PATSEKIN¹, R. FATIG¹, B. RAJWA¹, P. CARLSGAARD¹, L. AVRAMOVA¹, C. HOLDMAN¹, K. RAGHEB¹, P. RIGBY¹, J. STURGIS¹, AND A. JUAN-GARCIA¹¹Purdue University, West Lafayette, IN**PS-9B-I-162** Peripheral Nerve Regeneration Using a Tension-inducing ScaffoldR. E. WILSON^{1,2}, J. P. FISHER², AND S. SHAH²¹Case Western Reserve University, Cleveland, OH, ²University of Maryland, College Park, MD**PS-9B-I-163** Biological Sutures for Cell Delivery to the Heart: Assessment of Delivery ScaffoldS. ROWLINSON¹, J. GUYETTE², S. SHAW², D. SOOD², K. MINN², A. DEMARTINO², B. CHOATE², A. KAZANOVICZ², M. ROLLE², G. PINS², AND G. GAUDETTE²¹University of Miami, Coral Gables, FL, ²Worcester Polytechnic Institute, Worcester, MA

PS-9B-I-164 Palladium-Carbon Nanotube Electrocatalyst for Methanol Oxidation in Fuel CellsH. LIN¹, Z. ZHU², AND S. ZHOU²¹The Cooper Union, Manhattan, NY, ²Worcester Polytechnic Institute, Worcester, MA**PS-9B-I-165** Effect of Reaction Conditions on Size and Yield of Poly(ethylene glycol) (PEG) MicrogelsJ. STUKEL¹, AND R. WILLITS^{1,2}¹Saint Louis University, St. Louis, MO, ²University of Akron, Akron, OH**PS-9B-I-166** Adipose Progenitor Cells Promote Breast Cancer via their Extracellular MatrixJ. X. WANG¹, E. M. CHANDLER¹, AND C. FISCHBACH¹¹Cornell University, Ithaca, NY**PS-9B-I-167** Dental Materials and Oral Bacterial InteractionH. SHIH¹, K. S. GREGSON², AND R. L. GREGORY^{2,3}¹Indiana-University Purdue-University Indianapolis, Indianapolis, IN, ²Indiana University School of Dentistry, Indianapolis, IN, ³Tobacco 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. SHAH¹, M. FRANCIS-SEDLAK², M. CALT¹, AND C. L. HALL¹¹The College of New Jersey, Ewing, NJ, ²Illinois Institute of Technology, Chicago, IL**PS-9B-I-169** Employing Chondroitin as an Enzyme EncapsulationB. MINDEN - BIRKENMAIER¹, R. ARECHEDERRA¹, AND S. MINTER¹¹St. Louis University, St. Louis, MO**PS-9B-I-170** Endothelial Inflammation Response under Cyclic Stretch Profiles on Micro-patterned LinesP. MATHIEU^{1,2}, M. ASMUTH³, AND B. HELMKE¹¹University of Virginia, Charlottesville, VA, ²North Carolina State University, Raleigh, NC, ³Vanderbilt University, Nashville, TN**PS-9B-I-171** Diffusion Tensor Imaging Voxel-based Analysis of Pediatric Traumatic Brain InjuryK. W. AYOUB^{1,2}, E. A. WILDE², E. D. BIGLER³, Z. CHU⁴, T. C. WU⁵, J. V. HUNTER⁴, A. C. VASQUEZ², AND H. S. LEVIN²¹Rice University, Houston, TX, ²Baylor College of Medicine, Houston, TX, ³Brigham Young University, Provo, TX, ⁴Texas Childrens Hospital, Houston, TX, ⁵Brigham Young University, Provo, UT**PS-9B-I-172** The Effect of Hypoxia on the Motion of Jurkat T-cells in a Multi-Trap NanophysiometerK. HOLUB¹, A. DHUMMAKUP², AND K. SEALE²¹Valparaiso University, Valparaiso, IN, ²Vanderbilt University, Nashville, TN**PS-9B-I-173** Does Substrate Stiffness Influence Non-Viral Plasmid DNA Trafficking?R. W. DONNELLY¹, M. HOTIC¹, T. K. DEACY¹, A. R. RUIZ¹, AND R. C. GEIGER¹¹Florida 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. SULLIVAN¹, J. BLANCHETTE¹, AND P. TOPIWALA¹¹University of South Carolina, Columbia, SC**PS-9B-I-175** Characterization of Gold Nanoparticle-quantum Dot Assemblies and Their Potential Applications as BiosensorsE. L. PALMA¹, A. STADLER², P. SUN², AND O. GANG²¹Stony Brook University, Stony Brook, NY, ²Brookhaven National Laboratory, Upton, NY**PS-9B-I-176** Exploring the Dimensions of the Olfactory CodeG. SHAMSAN¹, AND B. RAMAN¹¹Washington University in St. Louis, St. Louis, MO**PS-9B-I-177** Multi-Step Development of Anatomical Urethane Phantoms for Optical ExperimentationC. GREGG¹, J. RYAN¹, K. POTERALA¹, H. BABIKER¹, D. COLLINS¹, A. KREVER¹, AND D. FRAKES¹¹Arizona State University, Tempe, AZ**PS-9B-I-178** Digital Transcriptome Screening to Identify Universal Tumor Antigens for Mantle Cell LymphomaR. REKHI¹, H. QIN², AND L. KWAK²¹Rice University, Houston, TX, ²MD Anderson Cancer Center, Houston, TX**PS-9B-I-179** Determination of Kinetic Parameters for Modeling Poly(ethylene glycol) Diacrylate Hydrogel FormationJ. JAMES¹, C-Y. LEE¹, M. TURTURRO¹, F. TEYMOUR¹, AND G. PAPAVALIOU¹¹Illinois Institute of Technology, Chicago, IL**PS-9B-I-180** Phosphoproteomic Profiling & Conservation Analysis of Phosphotyrosine Sites in Renal Collecting DuctB. ZHAO^{1,2}, T. PISITKUN², C-L. CHOU², AND M. A. KNEPPER²¹University of Michigan, Ann Arbor, MI, ²National Heart, Lung, and Blood Institute, NIH, Bethesda, MD**PS-9B-I-181** Boronic Acid Functionalized Gold Nanoparticles for Determining Protein GlycationD. KIM¹, C. ZHANG¹, B. HAN¹, AND V. PEREZ-LUNA¹¹Illinois Institute of Technology, Chicago, IL**PS-9B-I-182** A Simple Mock Circulatory System for Testing Direct Mechanical Ventricular ActuationK. SWARTZMILLER¹, B. SCHMITT¹, D. REYNOLDS¹, R. DARNER¹, AND M. ANSTADT¹¹Wright State University, Dayton, OH**PS-9B-I-183** Microfluidic Bandage for Localized Oxygen-Enhanced Wound HealingZ. H. MERCHANT¹, J. LO², AND D. T. EDDINGTON²¹University of Pennsylvania, Philadelphia, PA, ²University of Illinois, Chicago, IL**PS-9B-I-184** Dependence of Stress on Geometry and Stiffness of Calcified Plaque in Arterial ModelsP. ROGERSON¹, C. BUFFINTON¹, AND D. EBENSTEIN¹¹Bucknell University, Lewisburg, PA**PS-9B-I-185** High Speed Insertion Mechanics of Microelectrode Arrays for Implantable Neural ProsthesesB. LAU¹, Y. XIAO², AND M. HAN³¹University of California, Los Angeles, Los Angeles, CA, ²University of California, Berkeley, Berkeley, CA, ³Huntington Medical Research Institutes, Pasadena, CA**PS-9B-I-186** Mechanical Analysis of Cell Contracted Collagen for the Strengthening of Vascular GraftsS. R. SOOD¹, D. SHREIBER¹, AND I. GAUDET¹¹Rutgers University, Piscataway, NJ**PS-9B-I-187** A Method for Measuring Hydrostatic Pressure in Microfluidic Devices by Compressibility of GasesK. ROMAN¹, K. SEALE², AND J. WIKSWO²¹Vanderbilt University, Madison, TN, ²Vanderbilt University, Nashville, TN**PS-9B-I-188** Novel Parthenolide Delivery System for Acute Myeloid Leukemia TreatmentH. C. WATKINS¹, AND D. BENOIT¹¹University of Rochester, Rochester, NY**PS-9B-I-189** Optimizing the Temperature Gradients used in DNA Melting AnalysisD. P. SINGH¹, AND N. CREWS¹¹Louisiana Tech University, Ruston, LA**PS-9B-I-190** Investigation of Radical Production from Cells using EPR Spin TrappingR. CRUZ-ACUÑA¹, AND F. VILLAMENA²¹University of Puerto Rico, Mayaguez, Puerto Rico, ²The Ohio State University, Columbus, OH

PS-9B-I-191 Methods of Enhancing Cell Viability in Three Dimensional Tissue EngineeringD. B. SNYDER¹, AND S. WANG¹¹Louisiana Tech University, Ruston, LA**PS-9B-I-192** Investigating Molecular Communication Between Microglia and CD4+ T-cells Using a Microfluidic PlatformL. E. CHATFIELD¹, R. THOBHANI¹, S. FALEY¹, K. SEALE¹, AND J. WIKSWO¹¹Vanderbilt University, Nashville, TN**PS-9B-I-193** Effects of Left Ventricular Pacing Location on Cardiac Function in a Dyssynchronously Failing HeartR. M. LUEVANOS¹, J. OMENS², AND E. HOWARD²¹University of California Santa Barbara, La Jolla, CA, ²University 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. IRVING¹, AND J. KAPPA²¹University of Notre Dame, South Bend, IN, ²Yale University, New Haven, CT**PS-9B-I-195** A Study of Hemorheological Disorders in Diabetic Patients with End Stage Renal DiseaseR. A. MUNOZ¹, P. DHAR², M. HAMMES³, AND K. CASSEL⁴¹University of Arizona, Tucson, Arizona, ²Illinois Institute of Technology, Chicago, IL, ³University of Chicago, Chicago, IL, ⁴Illinois, Chicago, IL**PS-9B-I-196** Sensory Integration of Visual and Vestibular Cues in Recognition of Roll-tilt MotionA. ADATIA^{1,2}, R. CLARET-YAKOVENKO^{2,3}, F. KARMALI^{2,4}, K. LIM², AND D. MERFELD^{2,4}¹University of Saskatchewan, Saskatoon, Saskatchewan, Canada, ²Massachusetts Eye and Ear Infirmary, Boston, MA, ³Swiss Federal Institute of Technology of Lausanne, Lausanne, Vaud, Switzerland, ⁴Harvard Medical School, Cambridge, MA**PS-9B-I-197** Designing a Surface Eroding Multilayered Plasticized Film for Drug DeliveryR. VAN STELLE¹, C. RABEK², S. SUNDARARAJ², D. PULEO², AND T. DZIUBLA²¹Georgia Institute of Technology, Atlanta, GA, ²University of Kentucky, Lexington, KY**PS-9B-I-198** Mapping Harmonic Response for Current-Control in Miniature Wireless Stimulators for Medical ApplicationsV. D. LOPEZ KLEIN¹, B. TOWE¹, D. GULICK¹, AND P. LARSON¹¹Arizona State University, Tempe, AZ**PS-9B-I-199** Assessing Intracellular Oxidative Stress in Co-Exposures of Carbon Black & Iron Oxide NanoparticlesS. H. HO¹, J. M. BERG¹, W. HWANG¹, R. TAYLOR¹, B. GUO¹, AND C. M. SAYES¹¹Texas A&M University, College Station, TX
¹Carnegie 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. FRANCISCO¹, J. W. OGLE¹, C. L. GILCHRIST¹, J. CHEN¹, S. L. CRAIG¹, AND L. A. SETTON¹

¹Duke University, Durham, NC

10:45AM OP-9-1-1B In Situ Forming Transient-Network Hydrogels for Tissue Morphogenesis

B. LIU¹, Y. LIU¹, AND W. SHEN¹

¹University of Minnesota, Minneapolis, MN

11:00AM OP-9-1-1C Hydrogels with Time-Dependent Mechanical Properties Enhance Cardiomyocyte Differentiation In Vitro

J. L. YOUNG¹, AND A. J. ENGLER¹

¹UC San Diego, La Jolla, CA

11:15AM OP-9-1-1D Click Chemistry for Synthesis of Modular Poly(ethylene glycol) (PEG) Scaffolds

P. K. NGUYEN¹, AND D. L. ELBERT¹

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

11:30AM OP-9-1-1E Tuning Mechanical Properties of Multiphoton-Fabricated, Biological Macromolecular Scaffolds

E. SPIVEY¹, C. E. SCHMIDT¹, AND J. B. SHEAR¹

¹The University of Texas at Austin, Austin, TX

11:45AM OP-9-1-1F Fabrication of Chemoselectively Crosslinked Hydrogels via Staudinger Ligation

K. M. GATTAS-ASFURA¹, AND C. L. STABLER¹

¹University 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. ZHANG¹, AND J.-C. LIAO¹

¹Columbia University, New York, NY

10:45AM OP-9-1-2B Development of Small Molecules Models for the AMOEBA Polarizable Force Field

J. C. WU¹, AND P. Y. REN¹

¹The University of Texas at Austin, Austin, TX

11:00AM OP-9-1-2C Editing and Aligning Complex Molecular Pathways Using 3D Models

B. YANKAMA¹, R. UMETON^{1,2}, S. AYYADURAI¹, AND C. F. DEWEY¹

¹Massachusetts Institute of Technology, Cambridge, MA, ²University 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. HANCOCK¹, M. L. KUTYS¹, AND J. FRICKS¹

¹Penn 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'AURIA¹, G. M. DONATO¹, M. C. GRAY¹, E. L. HEWLETT¹, AND J. A. PAPIN¹

¹University 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. KOO¹, A. SURENDRAN^{1,2}, J. M. WENTZ¹, M. I. LEGRAND¹, J. E. YAZBEK¹, AND C. F. DEWEY JR¹

¹Massachusetts Institute of Technology, Cambridge, MA, ²National 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. OH¹, S. O. ISIKMAN¹, M. LEE¹, AND A. OZCAN^{1,2}

¹Electrical Engineering Department, University of California, Los Angeles, CA, ²California 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. COSKUN¹, I. SENCAN¹, T.-W. SU¹, AND A. OZCAN¹

¹UCLA 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. ISIKMAN¹, I. SENCAN¹, O. MUDANYALI¹, W. BISHARA¹, C. OZTOPRAK¹, AND A. OZCAN^{1,2}

¹UCLA Electrical Engineering Dept., Los Angeles, CA, ²California 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. LIDSTONE¹, V. CHAUDHRY¹, A. KOHL¹, L. TRUMP¹, L. B. SCHOOK¹, AND B. T. CUNNINGAM¹

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

11:30AM OP-9-1-3E Multiplexed and Reiterative Fluorescence Labeling via DNA-Circuit Technologies

D. Y. DUOSE¹, R. M. SCHWELLER¹, W. N. HITTELMAN², AND M. R. DIEHL¹

¹Rice University, Houston, TX, ²M.D Anderson Cancer Center, Houston, TX

11:45AM OP-9-1-3F Lensfree Incoherent Microscopy on Nano-Structured Chips

B. KHADEMOSSEINIEH¹, I. SENCAN¹, G. BIENER¹, T.-W. SU¹, A. COSKUN¹, D. TSENG¹, AND A. OZCAN^{1,2}

¹UCLA, Los Angeles, CA, ²California 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. SOLANKI¹, AND R. F. KIRSCH^{1,2}

¹Case Western Reserve University, Cleveland, OH, ²Cleveland Functional Electrical Simulation Center, Cleveland, OH

10:45AM OP-9-1-4B Trunk Dynamics in Response to Position Perturbations

E. MILLER¹, B. BAZRGARI², B. HENDERSHOT¹, M. NUSSBAUM², AND M. MADIGAN²
¹Virginia Tech - Wake Forest, Blacksburg, VA, ²Virginia 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. MOLLAZADEH¹, V. AGGARWAL¹, A. LAW², A. DAVIDSON², M. SCHIEBER², AND N. THAKOR¹

¹Johns Hopkins University, Baltimore, MD, ²University of Rochester, Rochester, NY

11:15AM OP-9-1-4D Spike Distribution Analysis of Surface EMG from Stroke Survivors

X. LI¹, N. SURESH¹, F. J. NEZHAD¹, W. Z. RYMER^{1,2}, AND P. ZHOU^{1,2}

¹Rehabilitation Institute of Chicago, Chicago, IL, ²Northwestern University, Chicago, IL

11:30AM OP-9-1-4E Role of Tendon Vibration in Multijoint Reflex Coupling of the Hemiparetic Arm Post Stroke

B. GADHOKE¹, AND B. D. SCHMIT¹

¹Marquette University, Milwaukee, WI

11:45AM OP-9-1-4F Recording Swallowing Patterns for Activating a Functional Electrical Stimulation System for Dysphagia

A. J. HADLEY^{1,2}, K. KRIVAL³, AND D. TYLER^{1,2}

¹Case Western Reserve University, Cleveland, OH, ²Functional Electrical Stimulation Center, Cleveland, OH, ³Kent 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. AMIRAM¹, F. GARCIA QUIROZ¹, AND A. CHILKOTI

¹Duke University, Durham, NC

10:45AM OP-9-1-5B Engineering a Human Methionine Lyase as a Cancer Therapeutic

O. M. PALEY¹, E. STONE¹, B. EKERDT¹, S. YANG¹, AND G. GEORGIU¹

¹University of Texas, Austin, Austin, TX

11:00AM OP-9-1-5C Hydrogel Encapsulated Glucose Oxidase: Effect on Cell Growth and Proliferation

R. M. KHAN¹, A. GUISEPPi-ELIE², AND P. VADGAMA¹

¹Queen Mary University of London, London, United Kingdom, ²Clemson University, Clemson, SC

11:15AM OP-9-1-5D Light-induced Activation of Caged Morpholino Oligonucleotides in Embryonic Zebrafish

C. M. JARREAU¹, E. MENELAU¹, K. SVOBODA¹, AND T. MONROE¹

¹Louisiana 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. LEE¹, W. E. SONNTAG², AND Y. W. LEE

¹Virginia Tech-Wake Forest University, Blacksburg, VA, ²University 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. AMIN¹, A. MAJUMDAR¹, AND B. SUK¹

¹Boston 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. TSE¹, AND A. J. ENGLER¹

¹University 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. MOLDOVAN¹, AND N. I. MOLDOVAN¹

¹Davis 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. SHIH¹, AND S. YAMADA¹

¹University of California, Davis, CA

11:15AM OP-9-1-6D Epidermal Growth Factor Regulates Medulloblastoma *In Vitro* Migration

V. DUDU¹, V. ROTARI¹, Q. KONG², AND M. VAZQUEZ¹

¹City College of New York, New York, NY, ²University of Illinois at Urbana-Champaign, Urbana, IL

11:30AM OP-9-1-6E Dynamic Actin Densities in the Axon of Sensory Neurons

J. CHETTA¹ AND S. SHAH¹

¹University of Maryland, College Park, MD

11:45AM OP-9-1-6F Mechanics of Leukocyte Transmigration through Endothelial Cell Monolayers

K. M. STROKA¹, AND H. ARANDA-ESPINOZA¹

¹University 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. LE¹, AND J. WAGENSEIL¹

¹Saint Louis University, St. Louis, MO

10:45AM OP-9-1-7B Three-Dimensional Microscopy to Study Regional Microstructural Changes during Aneurysm Development

S. SAATCHI¹, J. AZUMA¹, N. WANCHOO¹, P. S. TSAO¹, S. J. SMITH¹, P. G. YOCK¹, AND C. A. TAYLOR¹

¹Stanford 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^{1,2}, J. A. PHILLIPPI^{1,3}, T. G. GLEASON^{1,3}, AND D. A. VORP^{1,2}

¹University of Pittsburgh, Pittsburgh, PA, ²McGowan Institute for Regenerative Medicine, Pittsburgh, PA, ³HLESI, Pittsburgh, PA

11:15AM OP-9-1-7D Comparison of the Postnatal Somatic Growth Patterns between the Pulmonary Trunk and Ascending Aorta

B. FATA¹, D. GOTTLIEB², A. COIS³, G. STETTEN¹, J. MAYER², AND M. SACKS¹

¹University of Pittsburgh, Pittsburgh, PA, ²Children's Hospital of Boston, Harvard Medical School, Boston, MA, ³Carnegie Mellon University, Pittsburgh, PA

11:30AM OP-9-1-7E A New Constitutive Model of Arterial Wall Based on Finite-Strain Micromechanical MethodH. CHEN¹, Y. LIU¹, X. ZHAO¹, AND G. S. KASSAB¹¹Indiana University-Purdue University, Indianapolis, IN**11:45AM OP-9-1-7F** The Mechanical Behavior of Arteries Under TorsionS. D. LAMM¹, J. R. GARCIA¹, AND H-C. HAN¹¹University 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. JEAN¹, A. PARKAR¹, N. MASOUMI¹, AND G. C. ENGELMAYR¹¹The 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. BELLINI¹, AND E. S. DI MARTINO¹¹University 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. JOSHI¹, K-M. JAN², AND D. RUMSCHITZKI¹¹City College of New York, New York, NY, ²College 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. RAGHU¹, AND C. TAYLOR¹¹Stanford University, Stanford, CA**11:30AM OP-9-1-8E** Fully automated 3D mesh Generation from Multi-domain Voxel ImagesT. C. DOEHRING¹¹Drexel University, Philadelphia, PA**11:45AM OP-9-1-8F** Numerical Study of Blood Flow after Embolization of Cerebral Aneurysm with Yield Stress FluidsW. WANG¹, F. GRAZIANO², V. M. RUSSO², AND D. B. KHISMATULLIN¹¹Tulane University, New Orleans, LA, ²Louisiana 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. HUANG¹, M. CRAWFORD², P. NANA-SINKAM², AND S. GHADIALI¹¹Biomedical Engineering, Columbus, OH, ²Department of Internal Medicine, Columbus, OH**10:45AM OP-9-1-9B** Expanding on Lung SlicesS. UHLIG¹, C. MARTIN¹, S. RAUSCH², R. METZKE², O. PACK¹, AND W. WALL²¹RTWH Aachen University, Aachen, NRW, Germany, ²Technische 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. BIRUKOV¹¹The 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. DARQUENNE¹, J. M. OAKES¹, AND M. SCADENG¹¹University of California, San Diego, La Jolla, CA**11:30AM OP-9-1-9E** High Magnitude Stretch Decreases MLC Phosphorylation in Alveolar EpitheliaB. C. DI PAOLO¹, AND S. S. MARGULIES¹¹University of Pennsylvania, Philadelphia, PA**11:45AM OP-9-1-9F** Changes in Cell Mechanics During Airway Reopening Alter Pulmonary Epithelial Barrier FunctionA-M. JACOB¹, AND D. P. GAVER¹¹Tulane 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. LAKE¹, AND V. H. BAROCAS¹¹University of Minnesota, Minneapolis, MN**10:45AM OP-9-1-10B** Effect of Cyclic Compressive Loading on Muscle Mechanical Properties Following Eccentric ExerciseC. M. HAAS¹, F. HAO¹, Y. ZHAO¹, T. A. BUTTERFIELD², AND T. M. BEST¹¹The Ohio State University, Columbus, OH, ²University of Kentucky, Lexington, KY**11:00AM OP-9-1-10C** Contributions of Neural Tone to Muscle-Tendon Unit Stress-Relaxation Biomechanical PropertiesS. MANNAVA^{1,2}, W. F. WIGGINS^{1,2}, J. STITZEL², M. F. CALLAHAN¹, L. A. KOMAN¹, T. L. SMITH¹, AND C. J. TUOHY¹¹Wake Forest University School of Medicine, Winston Salem, NC, ²Wake 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. MARTURANO¹, J. D. ARENA¹, AND C. K. KUO¹¹Tufts University, Medford, MA**11:30AM OP-9-1-10E** Damage Evolution Process in LigamentsZ. GUO¹, J. BARRETT², AND R. DE VITA¹¹Virginia Tech, Blacksburg, VA, ²Virginia-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^{1,2}, S. HAYON³, T. SMITH¹, C. TUOHY¹, AND S. MANNAVA¹¹Wake Forest University School of Medicine, Winston-Salem, NC, ²VT-WFU School of Biomedical Engineering and Sciences, Winston-Salem, NC, ³Wake Forest University, Winston-Salem, NC

Track: Devices: Nano to Micro – 9-1-I**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. FINE¹, A. GRATTONI¹, S. HOSAL², A. ZIEMYS¹, E. DE ROSA¹, J. GILL¹, M. KOJIC¹, R. MEDEMA², M. MILOSEVIC³, L. BROUSSEAU, III¹, L. HUDSON², R. GOODALL², M. FERRARI^{1,4}, AND X. LIU¹¹The University of Texas Health Science Center at Houston, Houston, TX, ²NanoMedical Systems, Inc., Austin, TX, ³R & D Center for Bioengineering, Kragujevac, Šumadija, Serbia, ⁴The 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. LEE¹, F. GENTILE², A. VAN DE VEN³, M. FERRARI³, AND P. DECUZZI³¹University of Texas at Austin, Austin, TX, ²University of Magna Graecia at Catanzaro, Catanzaro, Italy, ³The 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. WANG¹, S. K. LAI¹, L. ENSIGN¹, R. CONE¹, AND J. HANES¹¹The 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. FISCHER¹, R. H. DANIELS², E. LI², V. COWLES³, J. L. MILLER³, AND T. A. DESAI¹¹UCSF, San Francisco, CA, ²Nanosys, Inc, Palo Alto, CA, ³Depomed, Menlo Park, CA**11:30AM OP-9-1-11E** Development of a Nano/Micro Particle Protein Delivery SystemJ. COLEMAN¹, AND A. LOWMAN¹¹Drexel University, Philadelphia, PA**11:45AM OP-9-1-11F** Thermoresponsive Nanocomposite Double Network Hydrogels with Cell-Releasing BehaviorR. FEI¹, J. T. GEORGE¹, AND M. A. GRUNLAN¹¹Texas 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. MURTHY¹, J. M. TAM¹, J. O. TAM¹, D. INGRAM¹, M. SCHULZE¹, R. NGUYEN¹, L. L. MA¹, K. V. SOKOLOV¹, AND K. P. JOHNSTON¹¹University of Texas at Austin, Austin, TX**10:45AM OP-9-1-12B** Multifaceted Nano- and Micropatterned Surfaces Created with Laser Scanning LithographyJ. H. SLATER¹, J. S. MILLER², S. S. YU³, AND J. L. WEST¹¹Rice University, Houston, TX, ²University of Pennsylvania, Philadelphia, PA, ³Vanderbilt University, Nashville, TN**11:00AM OP-9-1-12C** Single Walled Carbon Nanotube Peapods as Photothermal Agents for Laser Cancer TherapyJ. WHITNEY¹, J. ZHANG¹, S. NAHA², S. TORTI³, H. DORN¹, AND M. N. RYLANDER¹¹Virginia Tech, Blacksburg, VA, ²ADA Technologies, Littleton, CO, ³Wake 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^{1,2}, Y. LEE¹, A. KOHLI^{1,2}, K. A. KELLY³, AND A. BELCHER^{1,2}¹Massachusetts Institute of Technology, Cambridge, MA, ²Koch Institute of Integrative Cancer Research, MA Institute of Technology, Cambridge, MA, ³University 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^{1,2}, S. S. YU^{1,2}, AND T. D. GIORGIO^{1,3}¹Vanderbilt University Department of Biomedical Engineering, Nashville, TN, ²Vanderbilt Institute of Nanoscale Science and Engineering, Nashville, TN, ³Vanderbilt University Department of Chemical and Biomolecular Engineering, Nashville, TN**11:45AM OP-9-1-12F** Monodisperse, Stable Nanoparticles based on Amphiphilic Peptide-Polymer ConjugatesT. XU¹¹University 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. SHUKLA¹, A. C. ENGLER¹, AND P. T. HAMMOND¹¹Massachusetts Institute of Technology, Cambridge, MA**10:45AM OP-9-1-13B** Polymeric Nanoparticles for Anti-angiogenic Peptide DeliveryR. B. SHMUELI¹, J. E. KOSKIMAKI¹, J. SUNSHINE¹, P. A. CAMPOCHIARO¹, A. S. POPEL¹, AND J. J. GREEN¹¹Johns Hopkins University, Baltimore, MD**11:00AM OP-9-1-13C** Exploring Multi-Domain Peptides and Gelatin Microparticles as an Osteogenic Factor Delivery SystemD. M. YOON¹, B. Y. LU¹, E. L. BAKOTA¹, F. KASPER¹, J. D. HARTGERINK¹, AND A. G. MIKOS¹¹Rice University, Houston, TX**11:15AM OP-9-1-13D** Low Viscosity Highly Concentrated Dispersions of Stable IgG Particles Formed by SWIFT FreezingM. A. MILLER¹, B. WILSON¹, J. MAYNARD¹, AND K. P. JOHNSTON¹¹The University of Texas at Austin, Austin, TX**11:30AM OP-9-1-13E** GLP-1 polymer Drug Depots for Treatment of Type-2 DiabetesM. AMIRAM¹, AND A. CHILKOTI¹¹Duke University, Durham, NC**11:45AM OP-9-1-13F** Swelling and Insulin Release of Glucose-Responsive Microparticles and NanogelsS. R. MAREK¹, AND N. A. PEPPAS¹¹The 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. MANN¹, T. TANAKA^{1,2}, R. NIEVES-ALICEA¹, X. LIU^{1,2}, G. LOPEZ-BERESTEIN³, A. SOOD³, AND M. FERRARI^{1,2}¹University of Texas Health Science Center at Houston, Houston, TX, ²University of Texas at Austin, Austin, TX, ³University 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-Interventions**S. KONA^{1,2}, H. XU^{1,2}, Y-T. TSAI^{1,2}, L-C. SU^{1,2}, J-F. DONG³, L. TANG^{1,2}, AND K. T. NGUYEN^{1,2}¹University of Texas at Arlington, Arlington, TX, ²The University of Texas Southwestern Medical Center, Dallas, TX, ³Baylor College of Medicine, Houston, TX**11:00AM OP-9-1-14C - Improving Protein Pharmacokinetics by Engineering Erythrocyte Affinity**S. KONTOS¹, AND J. A. HUBBELL¹¹Swiss Federal Institute of Technology, Lausanne, VD, Switzerland**11:15AM OP-9-1-14D - Biomarker-Triggered Aptamer Regulation Strategy for Targeted Therapeutics**N. LI¹, AND C-M. HO²¹University of Miami, Coral Gables, FL, ²University 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. CHAN¹, J-W. RHEE², G. GOLOMB³, R. LANGER¹, AND O. FAROKHZAD²¹Massachusetts Institute of Technology, Cambridge, MA, ²Harvard Medical School, Boston, MA, ³Hebrew University of Jerusalem, Jerusalem, Jerusalem, Israel**11:45AM OP-9-1-14F Doxorubicin-loaded Nanoscale Liposomes Targeted to E-selectin Ligands on Circulating Tumor Cells**V. PONMUDI¹, AND M. R. KING¹¹Cornell 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. CARRION¹, C. HUANG², AND A. J. PUTNAM¹¹University of Michigan, Ann Arbor, MI, ²University of California, Irvine, Irvine, CA**10:45AM OP-9-1-15B Human Mesenchymal Stem Cell Neural Differentiation by Synergistic Topographical & Sustained Biochemical Signaling**X. JIANG¹, AND S-Y. CHEW¹¹Nanyang Technological University, Singapore, Singapore, Singapore**11:00AM OP-9-1-15C Development of a Chondrogenic Pellet Preculture System for Cartilage Tissue Engineering Applications**E. J. LEVORSON¹, F. K. KASPER¹, AND A. G. MIKOS¹¹Rice University, Houston, TX**11:15AM OP-9-1-15D Combinatorial Development of Synthetic Polymeric Substrates for Clonal Growth of Human Pluripotent Stem Cells**K. SAHA¹, Y. MEI², R. LANGER², R. JAENISCH¹, AND D. ANDERSON²¹Whitehead Institute/MIT, Cambridge, MA, ²MIT, Cambridge, MA**11:30AM OP-9-1-15E Hematopoietic Stem Cell Culture on an Adipogenic Feeder Layer**D. L. GLETTIG¹, AND D. L. KAPLAN¹¹Tufts University, Medford, MA**11:45AM OP-9-1-15F Neural Progenitor Cell Response to Flow-Stimulated Endothelial Cell Extracellular Matrix Production**C. M. ZWOLINSKI¹, K. S. ELLISON¹, N. DEPAOLA², AND D. M. THOMPSON¹¹Rensselaer Polytechnic Institute, Troy, NY, ²Illinois 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. NOVAK¹, F. YUAN¹, AND W. M. REICHERT¹¹Duke University, Durham, NC**10:45AM OP-9-1-16B Novel Near-infrared Fluorescence (NIR) Nanoparticles for In Vivo Imaging of Inflammatory Diseases**J. ZHOU¹, Y-T. TSAI¹, H. WENG¹, AND L. TANG¹¹University 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 Circulation**S. M. WHITE¹, C. HUGHES¹, S. GEORGE¹, AND B. CHOI¹¹University of California, Irvine, Irvine, CA**11:15AM OP-9-1-16D Parsing Inflammatory Cues in Angiogenesis Using Bioactive Hydrogels**A. L. ZACHMAN¹, S. W. CROWDER¹, H. K. KLEINMAN², J. B. KOHN³, AND H-J. SUNG¹¹Vanderbilt University, Nashville, TN, ²NIH, Bethesda, MD, ³Rutgers University, Piscataway, NJ**11:30AM OP-9-1-16E Dendritic Cell Response to a Library of Terpolymers with Graded Variations in Material Properties**P. KOU¹, A. JOY^{2,3}, B. CUNNINGHAM^{2,3}, J. KOHN^{2,3}, AND J. BABENSEE¹¹Georgia Institute of Technology, Atlanta, GA, ²Rutgers University, Piscataway, NJ, ³New Jersey Center for Biomaterials, Piscataway, NJ**11:45AM OP-9-1-16F In Vivo Imaging of Biomaterial-induced Reactive Oxygen Species**W. F. LIU^{1,2}, M. MA¹, D. G. ANDERSON¹, AND R. LANGER¹¹MIT, Cambridge, MA, ²UC 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. KOURIS¹, J. SQUIRRELL¹, AND B. OGLE^{1,2}¹University of Wisconsin - Madison, Madison, WI, ²University of Wisconsin-Madison, Madison, WI

10:45AM OP-9-I-17B Injectable, Macroporous Hydrogels for Controlled Stem Cell DeploymentN. HUEBSCH^{1,2}, C. MADL¹, M. XU¹, AND D. J. MOONEY^{1,2}¹Harvard University, Cambridge, MA, ²Wyss Institute for Biologically Inspired Engineering, Boston, MA**11:00AM OP-9-I-17C** Engineering Cell Derived MaterialsJ. C. WOLCHOK¹, AND P. TRESKO¹¹University of Utah, Salt Lake City, UT**11:15AM OP-9-I-17D** Microspotting of Adeno-Associated Virus for Combinatorial Genetic TestingK. I. MCCONNELL¹, R. SCHWELLER¹, M. DIEHL¹, AND J. SUH¹¹Rice University, Houston, TX**11:30AM OP-9-I-17E** Analysis of Promoters and Expression-targeted Gene Therapy, Optimization Based on Cell BehaviorX. ZHANG¹, AND W. T. GODBEY¹¹Tulane University, New Orleans, LA**11:45AM OP-9-I-17F** Matrix-mediated Non-viral Gene DeliveryC. CHU¹, AND H. KONG¹¹University 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. JONES¹, S. R. SMALL², J. B. MEDING², AND K. S. TOOHEY¹¹Rose-Hulman Institute of Technology, Terre Haute, IN, ²Joint 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. MENDOZA¹, M. H. KIM¹, AND K. ROY¹¹University 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. XU¹, N. D. HUEBSCH^{1,2}, AND D. J. MOONEY^{1,3}¹Harvard University, Cambridge, MA, ²Harvard-MIT Division of Health Sciences and Technology, Cambridge, MA, ³Wyss 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. MCNAMARA¹, M. KNOTHE TATE¹, AND H. CHANG¹¹Case Western Reserve University, Cleveland, OH**11:30AM OP-9-I-18E** Engineered Nanoparticles for Targeted Tumor DeliveryS. KADALI¹, Á. MERCADO¹, AND E. JABBARI¹¹University of South Carolina, Columbia, SC**11:45AM OP-9-I-18F** - Compression-induced Changes in Nuclear Rheology: Linking Force Response to Genome OrganizationT. A. ALCOSER¹, E. A. BOOTH-GAUTHIER¹, AND K. N. DAHL¹¹Carnegie 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. PANILAITIS¹, L. SUN¹, V. YADAV¹, AND D. KAPLAN¹
¹Tufts University, Medford, MA

1:45PM OP-9-2-1B Engineered Aprotinin for Enhanced Stability of Fibrin Biomaterials

K. LORENTZ¹, P. FREY^{1,2}, AND J. A. HUBBELL¹
¹Swiss Federal Institute of Technology (EPFL), Lausanne, VD, Switzerland, ²Centre 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^{1,2}, A. HUBER^{1,2}, R. HASHIZUME^{1,2}, N. J. AMOROSO¹, S. F. BADYLAK^{1,2}, AND W. R. WAGNER^{1,2}
¹McGowan Institute for Regenerative Medicine, University of Pittsburgh, Pittsburgh, PA, ²Department 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. CAVES¹, W. CUI¹, J. WEN¹, V. A. KUMAR^{1,2}, A. W. MARTINEZ^{1,2}, AND E. L. CHAIKOF^{1,2}
¹Emory University, Atlanta, GA, ²Georgia 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. HIGHLEY¹, S. H. BAKHRU¹, AND S. F. ZAPPE¹
¹Carnegie 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. ANNAMALAI¹, D. R. ARMANT¹, AND H. W. MATTHEW¹
¹Wayne 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. MARASCO¹, J. ENDERS¹, K. SEALE¹, J. MCLEAN¹, AND J. WIKSWO¹
¹Vanderbilt University, Nashville, TN

1:45PM OP-9-2-2B Computational Analysis of Extracellular Matrix Degradation in Tumor Microenvironments

M. O. PLATT¹, Z. T. BARRY¹, AND C. L. WILDER¹
¹Georgia Institute of Technology, Atlanta, GA

2:00PM OP-9-2-2C Modeling the Electrophysiology of the Mammalian Circadian Clock

C. DIEKMAN¹, AND D. FORGER¹
¹University of Michigan, Ann Arbor, MI

2:15PM OP-9-2-2D A Computational Model of Interactions between Human APOBEC3G and HIV Vif

I. HOSSEINI¹, AND F. MAC GABHANN¹
¹Johns Hopkins University, Baltimore, MD

2:30PM OP-9-2-2E Network Analysis-directed Assessment of FDA Approved Drugs for Antileishmanial Activity

A. K. CHAVALI¹, AND J. A. PAPIN¹
¹University 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. BESTE¹, N. DOYLE¹, A. STARZINSKI-POWITZ², D. A. LAUFFENBURGER¹, K. B. ISAACSON³, AND L. G. GRIFFITH¹
¹Massachusetts Institute of Technology, Cambridge, MA, ²Goethe Universität, Frankfurt am Main, Germany, ³Newton-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. HULAND¹, R. RAMASAMY², T. SOUTHARD¹, S. MUKHERJEE², W. W. WEBB¹, AND C. XU¹
¹Cornell University, Ithaca, NY, ²Weill Cornell Medical College, New York, NY

1:45PM OP-9-2-3B Molecular Imaging with Pump-Probe Optical Coherence Microscopy

Q. WAN¹, AND B. APPLGATE¹
¹TAMU, College Station, TX

2:00PM OP-9-2-3C MEMS Based Hyperspectral Imaging System Towards Imaging of Biological Tissue

S. BISH¹, Y. WANG¹, J. W. TUNNELL¹, AND J. X. ZHANG¹
¹University of Texas at Austin, Austin, TX

2:15PM OP-9-2-3D Ultrashort Pulse Nonlinear Optical Microscopy Spectral Imaging System

A. LEE¹, S. VITHA¹, A. HOLZENBURG¹, AND A. YEHI¹
¹Texas 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. BILLEH¹, M. LIU², AND T. BUMA²
¹University of Michigan, Ann Arbor, MI, ²University 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. PARK¹, B. E. APPLGATE¹, S. SHRESTA¹, P. PANDE¹, AND J. A. JO¹
¹Texas 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. BAKHRU¹, AND A. S. NAIN²
¹Carnegie Mellon University, Pittsburgh, PA, ²Virginia Tech, Blacksburg, VA

1:45PM OP-9-2-4B Perfusion System for Enhanced Viability and Local Chemical Stimulation of Organotypic Brain SlicesH. H. CAICEDO¹, M. VIGNES^{2,3}, B. BRUGG², AND J. M. PEYRIN²¹University of Illinois at Chicago, Chicago, IL, ²Université Pierre et Marie Curie, Paris, France, ³Institut Curie, Paris, France**2:00PM OP-9-2-4C** Dissecting *C. elegans* Neural Circuitry and Behavior in Microfluidic ArenasD. R. ALBRECHT¹, AND C. BARGMANN¹¹The Rockefeller University, New York, NY**2:15PM OP-9-2-4D** PEDOT Improves Sensitivity and Fidelity of *In Situ* Nerve Conduction SignalsC. M. FROST¹, K. EWING¹, B. WEI¹, Z. BAGHMANLI¹, P. CEDERNA¹, AND M. URBANCHEK¹¹University of Michigan, Ann Arbor, MI**2:30PM OP-9-2-4E** Novel Packaging and Interconnect Techniques for Implantable MEMS Devices for the BrainJ. SUTANTO¹, S. ANAND¹, A. SRIDHARAN¹, AND J. MUTHUSWAMY¹¹Arizona State University, Tempe, AZ**2:45PM OP-9-2-4F** An Optoelectronic Hybrid Device for *In Vivo* Stimulation and Recording of Neural MicrocircuitsJ. WANG¹, AND D. BORTON¹¹Brown 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. SMITH¹¹Ryerson University, Toronto, ON, Canada**1:45PM OP-9-2-5B** Program Improvement through Assessment and EvaluationL. HERZ¹¹Lehigh 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. YAZDI¹, S. ACHARYA¹, A. POLSANI¹, A. J. KHANNA¹, R. H. ALLEN¹, M. B. SACHS¹¹Johns Hopkins University, Baltimore, MD**2:15PM OP-9-2-5D** Digital Ink in the BME Classroom: Application in Quantitative PhysiologyS. A. CAREY¹, S. DANIEL¹, AND C. A. REINHART-KING¹¹Cornell University, Ithaca, NY**2:30PM OP-9-2-5E** Implementation of Problem-Based Learning in Two Sophomore Bioengineering CoursesA. SATERBAK¹, J. JACOT¹, AND T. VOLZ¹¹Rice University, Houston, TX**2:45PM OP-9-2-5F** Acquiring Experimental Design Skills Through Problem-Based LearningS. M. GEORGE¹, AND B. B. FASSE¹¹Georgia 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.¹, C-M. CHENG², AND P. LEDUC¹¹Carnegie Mellon University, Pittsburgh, PA, ²Harvard University, Cambridge, MA**1:45PM OP-9-2-6B** Nanoscale Mechanical Manipulation of the Endothelial Cell Surface Reveals Mechanical Coupling of Membrane RaftsD. FUENTES¹, C. BAE², AND P. J. BUTLER¹¹Penn State University, University Park, PA, ²State University of New York at Buffalo, Buffalo, NY**2:00PM OP-9-2-6C** Suggested Structure of Activated VinculinJ. GOLJI¹, AND M. MOFRAD¹¹UC Berkeley, Berkeley, CA**2:15PM OP-9-2-6D** The Primary Cilium: A Potential Receptor Antenna in Human Adipose Stem Cells?J. C. BODLE¹, A. R. SAKHARE¹, S. H. BERNACKI¹, J. QI², A. J. BANES³, AND E. G. LOBOA¹¹North Carolina State University, Raleigh, NC, ²Flexcell International Inc., Hillsborough, NC, ³University of North Carolina, Hillsborough, NC**2:30PM OP-9-2-6E** Mechanochemical Regulation of Actin Depolymerization KineticsC-Y. LEE^{1,2}, J. LOU^{1,3}, K-K. WEN⁴, S. ONO², S. G. ESKIN^{1,2}, P. A. RUBENSTEIN⁴, C. ZHU^{1,2}, AND L. V. MCINTIRE^{1,2}¹Georgia Institute of Technology, Atlanta, GA, ²Emory University, Atlanta, GA, ³Chinese Academy of Sciences, Beijing, China, People's Republic of, ⁴University of Iowa, Iowa City, IA**2:45PM OP-9-2-6F** Stem Cell Durotaxis - Trafficking to Fibrotic ScarsM. RAAB¹, AND D. DISCHER¹¹University 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. CHEN¹, D. BHATT², AND G. KASSAB³¹Purdue University, Indianapolis, IN, ²Harvard Medical School, Boston, MA, ³Indiana University School of Medicine, Indianapolis, IN**1:45PM OP-9-2-7B** Modelling and Experiments to Aid Performance Assessment of Biodegradable Metallic StentsJ. GROGAN¹, S. LEEN¹, AND P. MCHUGH¹¹NUI Galway, Galway, Galway, Ireland**2:00PM OP-9-2-7C** *In Vitro* and *In Vivo* Characterization of Biodegradable Polymer-based Drug Eluting StentS. K. YAZDANI¹, M. VORPAHL¹, S-H. SU², J. SHULZE², F. D. KOLODIE¹, AND R. VIRMANI¹¹CVPath Institute, Gaithersburg, MD, ²Biosensors International, Singapore, Singapore, Singapore**2:15PM OP-9-2-7D** Exploiting the Differential Cellular Effects of Elastin as a Device CoatingB. D. WILSON¹, L. K. SORENSEN¹, C. C. GIBSON¹, M. YOKLAVICH², L. L. KELLEY¹, Y-T. SHIU¹, AND D. Y. LI¹¹University of Utah, Salt Lake City, UT, ²OrbusNeich 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. LEE¹, K. GENOVESE², AND J. D. HUMPHREY¹¹Texas A&M University, College Station, TX, ²Università 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. CONNOR¹, W. I. DOUGLAS², AND M. W. MOHIUDDIN¹¹Michael E. DeBakey Institute, TX A&M University, College Station, TX, ²The 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. MORGAN¹, G. PENG¹, E. R. PFEIFFER¹, T. L. THIRKILL¹, G. C. DOUGLAS¹, D. A. STARR¹, AND A. I. BARAKAT¹¹University 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. SHI¹, AND J. M. TARBELL¹¹City 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. LEE¹, D. E. CONWAY², S. G. ESKIN¹, A. K. SHAH¹, AND L. V. MCINTIRE¹¹Georgia Institute of Technology, Atlanta, GA, ²University of Virginia, Charlottesville, VA**2:15PM OP-9-2-8D** Shear Stress Suppresses TNF Induced Apoptosis; In Part by Modulating DAPK Expression and ActivityK. RENNIER¹, AND J. Y. JI¹¹Indiana 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. FANG¹, C. SHI¹, E. MANDUCHI¹, M. CIVELEK¹, AND P. F. DAVIES¹¹University of Pennsylvania, Philadelphia, PA**2:45PM OP-9-2-8F** Atherosclerosis and Flow – The End Game?C. F. DEWEY JR¹¹MIT, 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. HEISE¹, AND S. GARANTZIOS¹¹National 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. PARAMESWARAN¹, M. MORIOKA², S. ITO², AND B. SUKI¹¹Boston University, Boston, MA, ²Nagoya University, Nagoya, Aichi Prefecture, Japan**2:00PM OP-9-2-9C** Mechanical Properties of Migrating Alveolar Epithelial CellsA. BADA¹, C. E. COZAD¹, L. M. CROSBY², E. ROAN¹, AND C. M. WATERS²¹University of Memphis, Memphis, TN, ²University of Tennessee Health Science Center, Memphis, TN**2:15PM OP-9-2-9D** *In Vivo* Optical Coherence Elastography of the TracheaC. J. ROBERTSON¹, Y-C. AHN¹, S-W. LEE¹, S. MAHON¹, Z. CHEN¹, M. BRENNER¹, AND S. C. GEORGE¹¹UCI, Irvine, CA**2:30PM OP-9-2-9E** PTEN and Akt Mediated Biomechanical Mechanisms of Lung Epithelial Cell Migration and Wound RepairC. COSMIN¹, S. BAO², D. KNOELL², AND S. GHADIALI²¹The Ohio State University, Columbus, OH, ²Ohio 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. NOEL¹, N. HONG¹, K. DEBOLT¹, A. FISHER¹, AND S. CHATTERJEE¹¹University 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^{1,2}, B. E. POLLOT², AND J. ONG²¹Wake Forest Institute for Regenerative Medicine, Winston-Salem, NC, ²University 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. LIU¹, S. GOVINDARAJAN¹, S. SETT¹, B. VEECKMANS², P. LOPES², AND E. BOELEN²¹Dassault Systemes Simulia Corp, Providence, RI, ²Materialise, Leuven, Flemish Brabant, Belgium**2:00PM OP-9-2-10C** Acetabular Cup Design and Orientation Affect Periacetabular Loading DistributionM. E. BEREND¹, S. R. SMALL¹, L. HOWARD², D. TUNC², C. A. BUCKLEY², AND M. A. RITTER¹¹JRSI Foundation, Inc., Mooresville, IN, ²Rose-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. KIM¹, C. GRIFFITH², S. LEUNG², L. GITAJN³, L. MURPHY³, A. H. HSIEH^{1,2}, R. V. O'TOOLE², AND V. D. PELLEGRINI²¹University of Maryland, College Park, MD, ²University of Maryland, Medical Center, Baltimore, MD, ³University of Maryland, Baltimore, MD**2:30PM OP-9-2-10E** Deletion of Osteocalcin and Osteopontin from Extracellular Matrix Leads to Increased Bone FragilityA. A. POUNDARIK¹, C. GUNDBERG², AND D. VASHISHTH¹¹Rensselaer Polytechnic Institute, Troy, NY, ²Yale University, New Haven, CT**2:45PM OP-9-2-10F** Measurement of Osteopontin and Osteocalcin from Laser Microdissected Microdamaged Regions in BoneL. KARIM¹, G. SROGA¹, AND D. VASHISHTH¹¹Rensselaer 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. LEE¹, A. K. GILL¹, M. BERGSNEIDER¹, AND J. W. JUDY¹
¹UCLA, Los Angeles, CA

1:45PM OP-9-2-11B Electronic Nanobiosensors for Genomic and Proteomic Biomarkers Analysis at Single Cell Level

S. PRABHULKAR¹, AND C-Z. LI¹
¹Florida International University, Miami, FL

2:00PM OP-9-2-11C An Implantable Biochip to Influence Patient Outcomes Following Trauma-induced Hemorrhage

A. GUISEPPI-ELIE¹
¹Clemson University, Clemson, SC

2:15PM OP-9-2-11D NanoCluster Beacon (NCB): a DNA-silver Nanocluster Probe that Fluoresces Upon Hybridization

H-C. YEH¹, J. SHARMA¹, J. J. HAN¹, J. S. MARTINEZ¹, AND J. H. WERNER¹
¹Los Alamos National Laboratory, Los Alamos, NM

2:30PM OP-9-2-11E Nanoscale Growth of Individual Bacteria with Hydrodynamic Sensing

P. KINNUNEN¹, I. SINN¹, D. NEWTON¹, M. BURNS¹, B. H. MCNAUGHTON¹, AND R. KOPELMAN¹
¹University of Michigan, Ann Arbor, MI

2:45PM OP-9-2-11F On-chip Labeling via Enzymatic DNA Polymerization for Nucleic Acid Detection

V. TJONG¹, H. YU¹, A. HUCKNALL¹, S. RANGARAJAN¹, AND A. CHILKOTI¹
¹Duke 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. SHARMA¹, Y. HU¹, M. STOLLER¹, R. S. RUOFF¹, M. FELDMAN², M. FERRARI³, AND X. ZHANG¹
¹Univ of Texas at Austin, Austin, TX, ²Univ of Texas Health Science Center at San Antonio, San Antonio, TX, ³Univ 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. ZHANG¹, H. GASKINS¹, AND P. J. KENIS¹
¹University 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. TEH¹, AND A. P. LEE¹
¹University of California, Irvine, Irvine, CA

2:15PM OP-9-2-12D Controlled Perturbation of Cells Using Magnetic Nanorods

A. CELEDON¹, AND D. WIRTZ²
¹Catholic University/Johns Hopkins, Santiago, Metropolitana, Chile, ²Johns Hopkins University, Baltimore, MD

2:30PM OP-9-2-12E Thermoresponsive Nanocomposite Hydrogels as Self-Cleaning Membranes for Glucose Biosensors

M. A. GRUNLAN¹, R. FEI¹, G. COTE¹, AND A. A. ABRAHAM¹
¹Texas 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. SEIL¹, AND T. J. WEBSTER¹
¹Brown 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. DEMENTO¹, N. BONAFE², W. CUI¹, S. M. KAECH¹, M. J. CAPLAN¹, E. FIKRIG¹, M. LEDIZET², AND T. M. FAHMY¹
¹Yale University, New Haven, CT, ²L² Diagnostics, New Haven, CT

1:45PM OP-9-2-13B Lupus Immunotherapy Using a CD4 Targeted, Hydrogel-Based Nanoparticle System

M. LOOK¹, E. STERN¹, Q. WANG¹, L. DIPLACIDO¹, J. E. CRAFT¹, AND T. M. FAHMY¹
¹Yale University, New Haven, CT

2:00PM OP-9-2-13C Comprehensive Immunomodulatory Treatment via Targeted Drug Delivery to ICAM-1

S. KANG¹, AND M. M. JIN¹
¹Cornell University, Ithaca, NY

2:15PM OP-9-2-13D Transcellular Transport of Nanocarriers Across Gastrointestinal Epithelial Cells by Targeting ICAM-1

R. GAFFARIAN¹, T. BHOWMICK¹, AND S. MURO¹
¹University of Maryland, College Park, MD

2:30PM OP-9-2-13E Development of Novel Single Chain Antibodies for Fibrin-targeted Theranostics

S. E. STABENFELDT¹, W. E. BROWN¹, L. CAO¹, AND T. H. BARKER¹
¹Georgia Institute of Technology / Emory University, Atlanta, GA

2:45PM OP-9-2-13F T Cell Vehicles Enhance Tumor Accumulation of Gold Nanoparticles

L. CARPIN^{1,2}, A. BEAR^{2,3}, J. YOUNG¹, N. LEWINSKI¹, A. FOSTER^{2,3}, AND R. DREZEK¹
¹Rice University, Houston, TX, ²Baylor College of Medicine, Houston, TX, ³Texas 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. KAMM¹
¹Massachusetts Institute of Technology, Cambridge, MA

1:45PM OP-9-2-14B Engineering the Differentiation of Multicellular Stem Cell Systems

T. C. MCDEVITT¹
¹Georgia Institute of Technology, Atlanta, GA

2:00PM OP-9-2-14C Electrophysiological Sorting of Pluripotent Stem Cell-Derived Cardiomyocytes in a Microfluidic PlatformF. B. MYERS¹, O. J. ABILEZ², C. K. ZARINS², AND L. P. LEE¹¹University of California, Berkeley, Berkeley, CA, ²Stanford University, Stanford, CA**2:15PM OP-9-2-14D** Enabling Technologies for Development and Characterization of Integrated Cellular SystemsR. BASHIR¹¹UIUC, Urbana, IL**2:30PM OP-9-2-14E** Mechanical Regulation of Tissue MorphogenesisN. GJOREVSKI¹, AND C. M. NELSON¹¹Princeton University, Princeton, NJ**2:45PM OP-9-2-14F** Synthetic Biology: From Modules to SystemsR. WEISS¹¹MIT, 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. FRIDLEY¹, I. FERNANDEZ¹, R. AMBLER¹, AND K. ROY¹¹The University of Texas at Austin, Austin, TX**1:45PM OP-9-2-15B** Role of Substrate Stiffness on ESC Differentiation into Endoderm LineageM. JARAMILLO¹, S. SINGH¹, J. CANDIELLO¹, P. KUMTA¹, AND I. BANERJEE¹¹University of Pittsburgh, Pittsburgh, PA**2:00PM OP-9-2-15C** Endoderm Expression in Embryonic Stem Cells is Driven by Scaffold StructureW. HELEN¹, C. C. KING¹, AND A. J. ENGLER¹¹UC San Diego, San Diego, CA**2:15PM OP-9-2-15D** Quantification and Enhancement of Contractile Characteristics in hESC and iPSC Derived CardiomyocytesS. D. LUNDY¹, M. J. BLOEMINK², M. A. GEEVES², M. A. LAFLAMME¹, AND M. REGNIER¹¹University of Washington, Seattle, WA, ²University 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. WANG¹, Z. TANG¹, I-H. PARK², Y. ZHU¹, S. PATEL¹, G. Q. DALEY³, AND S. LI¹¹UC Berkeley, Berkeley, CA, ²Yale School of Medicine, New Haven, CT, ³Harvard Medical School, Boston, MA**2:45PM OP-9-2-15F** Generation of Hematopoietic progenitors from Induced Pluripotent Stem Cells under Feeder Free SystemI. FERNANDEZ¹, J. LIN², AND K. ROY²¹University of Texas at Austin, Austin, TX, ²University 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. RANE¹, J. S. CHUANG¹, A. SHAH¹, D. P. HU¹, N. D. DALTON¹, Y. GU¹, K. L. PETERSON¹, J. H. OMENS¹, AND K. L. CHRISTMAN¹¹University of California San Diego, La Jolla, CA**1:45PM OP-9-2-16B** Cell-Seeded Fibrin Scaffolds for Cardiac Tissue EngineeringK. S. THOMSON¹, G. D. ROBINSON¹, F. S. KORTE¹, C. M. GIACHELLI¹, B. D. RATNER¹, M. SCATENA¹, AND M. REGNIER¹¹University of Washington, Seattle, WA**2:00PM OP-9-2-16C** Evaluating the Mechanical Contribution of De-novo Matrix in Engineered Heart Valve ScaffoldsJ. A. STELLA¹, N. J. AMOROSO¹, J. E. MAYER², W. R. WAGNER¹, AND M. S. SACKS¹¹University of Pittsburgh, Pittsburgh, PA, ²Children's Hospital Boston, Boston, MA**2:15PM OP-9-2-16D** In Situ Regeneration of the Heart ValveD. RAGHAVAN¹, J. K. WILLIAMS¹, J. YOO¹, S. J. LEE¹, J. E. JORDAN¹, AND A. ATALA¹¹Wake Forest University, Winston-Salem, NC**2:30PM OP-9-2-16E** Characterization of Sex-related Differences in the Phenotype of Valvular Interstitial CellsC. M. MCCOY¹, AND K. S. MASTERS¹¹University of Wisconsin-Madison, Madison, WI**2:45PM OP-9-2-16F** Comparison of Fibrin-based Engineered Tissue from Neonatal Versus Adult Human Dermal FibroblastZ. SYEDAIN¹, AND R. TRANQUILLO¹¹University 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. SMITH¹, P. W. WHITLOCK¹, T. M. SEYLER¹, C. N. NORTHAM¹, M. E. VAN DYKE¹, G. G. POEHLING¹, AND L. A. KOMAN¹¹Wake 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. YEATTS¹, AND J. P. FISHER¹¹University of Maryland, College Park, MD**2:00PM OP-9-2-17C** Mechanical Loading of Mesenchymal Stem Cells on Electrospun Scaffolds for Ligament Tissue EngineeringR. SHAFFER¹, J. KLUGE², L. DAHLGREN³, A. GOLDSTEIN¹, AND D. KAPLAN⁴¹Virginia Tech, Blacksburg, VA, ²University of Pennsylvania, Philadelphia, PA, ³Virginia-Maryland Regional College of Veterinary Medicine, Blacksburg, VA, ⁴Tufts University, Medford, MA**2:15PM OP-9-2-17D** In Situ Bioluminescence Imaging of BMP-2 Expression in a Perfusion BioreactorS. J. LAPP¹, H. SHEN¹, L. A. BASHUR¹, G. WANG¹, AND A. S. GOLDSTEIN¹¹Virginia Tech, Blacksburg, VA

2:30PM OP-9-2-17E Engineering Biomimetic Microenvironments for the Functional Regeneration of Vocal Fold Lamina PropriaA. J. FARRAN¹, A. K. JHA¹, R. L. DUNCAN¹, AND X. JIA¹¹University of Delaware, Newark, DE**2:45PM OP-9-2-17F** Characterization of Engineered Tissue Development with Biaxial Mechanical Testing and MicroscopyY. BAI¹, J. D. HUMPHREY¹, AND A. T. YEH¹¹Texas 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. LIPMAN¹, K. R. NIGHTINGALE¹, S. GRANT², D. MACLEOD², AND M. L. PALMERI^{1,2}¹Duke University, Durham, NC, ²Duke University Medical Center, Durham, NC**1:45PM OP-9-2-18B** Experimentation and Modeling of Beta-cell Ca²⁺ OscillationsP. EICH¹, N. TAMARINA¹, L. FRIDYLAND¹, AND L. PHILIPSON¹¹University of Chicago, Chicago, IL**2:00PM OP-9-2-18C** - Developing a Microbead-based, maAPC Platform to Generate Antigen-Specific Cytotoxic LymphocytesA. A. TU¹, Y-L. CHIU¹, M. OELKE², AND J. SCHNECK²¹Johns Hopkins University, Baltimore, MD, ²Johns Hopkins University School of Medicine, Baltimore, MD**2:15PM OP-9-2-18D** Monovalent PEGylated Fibrin 'A' Knob Peptides Inhibit Hemostatic Clot FormationN. M. ABOUJAMOUS¹, S. E. STABENFELDT¹, A. SOON¹, AND T. H. BARKER¹¹Georgia Institute of Technology, Atlanta, GA**2:30PM OP-9-2-18E** Cranberry Juice Does Not Alter Bacterial Growth but May Inhibit Bacterial AdhesionR. A. RICHARD¹, A. TAO², Y. ZHANG², AND T. CAMESANO²Bay Path College, Longmeadow, MA, ²Worcester 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. WAN¹, B. C. TAI¹, K. NARAYANAN¹, M. F. LEONG¹, J. K. TOH¹, H. LU¹, C. DU¹, K.-J. LECK¹, S. GAO¹, AND J. Y. YING¹¹Institute 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. KIM¹, H. G. SUNDARARAGHAVAN¹, AND J. A. BURDICK¹¹University of Pennsylvania, Philadelphia, PA**3:45PM OP-9-3-1C** Tunable Silk Fibers: Mimicking Natural Silkworm Processing with MicrofluidicsM. E. KINAHAN¹, E. FILIPPIDI², S. KÖSTER³, H. M. EVANS⁴, T. PFOHL⁵, D. L. KAPLAN⁶, AND J. Y. WONG¹¹Boston University, Boston, MA, ²New York University, New York, NY, ³Georg-August-Universität Goettingen, Goettingen, Germany, ⁴Max-Planck-Institute for Dynamics and Self-Organization, Goettingen, Germany, ⁵Universität Basel, Basel, Switzerland, ⁶Tufts University, Medford, MA**4:00PM OP-9-3-1D** Active Porous Scaffolds for Triggered Drug and Cell DeliveryX. ZHAO¹, C. A. CEZARI¹, AND D. J. MOONEY¹¹Harvard University, Cambridge, MA**4:15PM OP-9-3-1E** Trifunctional Porogens for the Development of an Injectable Putty to Treat Traumatic Bone DefectsR. BUCHANAN^{1,2}, M. MURPHY², D. YOON³, X. LIU^{1,2}, K. KASPER³, P. SIMMONS², A. MIKOS³, M. FERRARI^{1,2}, E. TASCIOTTI², A. HENSLEE³, AND M. NAIR³¹The University of Texas at Austin, Austin, TX, ²The University of Texas Health Science Center at Houston, Houston, TX, ³Rice University, Houston, TX**4:30PM OP-9-3-1F** Replicating the Topography of Intestinal Basement MembraneC. PFLUGER¹, AND R. CARRIER¹¹Northeastern 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. FOLEY¹, R. SKUKSPY², A. ARKIN^{1,2}, AND D. V. SCHAFFER¹¹UC Berkeley, Berkeley, CA, ²Lawrence Berkeley National Lab, Berkeley, CA**3:30PM OP-9-3-2B** A Comprehensive Computational Model of Mycoplasma GenitaliumJ. SANGHVI¹, J. KARR¹, AND M. COVERT¹¹Stanford University, Stanford, CA**3:45PM OP-9-3-2C** Temporal Cascades of Perturbed Biological Processes in Engineered Liver MimicsC. D. LASHER¹, Y. KIM¹, T. MURALI¹, AND P. RAJAGOPALAN¹¹Virginia 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. CHATTERJEE¹, J. E. PURVIS¹, AND S. L. DIAMOND¹¹University 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^{1,2}, D. CAMACHO¹, AND J. J. COLLINS^{1,2}¹Howard Hughes Medical Institute, Boston, MA, ²Boston University, Boston, MA**4:30PM OP-9-3-2F** Computational Analysis of the Compartmentalization of Phosphatase-Mediated Regulation of EGFRC. S. MONAST¹, AND M. J. LAZZARA¹¹University 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. HOLLINGSWORTH¹, K. L. MOODY¹, K. FENG¹, M. P. MCDUGALL¹, AND S. M. WRIGHT¹¹Texas A&M University, College Station, TX**3:30PM OP-9-3-3B** - A 64-Channel Parallel MRI TransmitterK. FENG¹, N. A. HOLLINGSWORTH¹, J. C. BOSSHARD¹, C.-W. CHANG¹, K. L. MOODY¹, M. P. MCDUGALL¹, AND S. M. WRIGHT¹¹Texas A&M University, College Station, TX**3:45PM OP-9-3-3C** - Automatic Color Segmentation of Histological Images for Cancer DiagnosisS. KOTHARI¹, Q. CHAUDRY¹, J. H. PHAN², A. N. YOUNG³, AND M. D. WANG²¹Georgia Tech, Atlanta, GA, ²Georgia Tech and Emory University, Atlanta, GA, ³Emory University, Atlanta, GA**4:00PM OP-9-3-3D** - TissueWikiMobile: An Easy Way to Access Large-scale Histology Image Data Using iPhoneC. CHENG¹, T. H. STOKES¹, S. HANG¹, AND M. D. WANG¹¹Georgia Institute of Technology, Atlanta, GA**4:15PM OP-9-3-3E** - Soft-threshold Filtering Approach for Compressive Sampling based Computed Tomography ReconstructionH. YU¹, AND G. WANG²¹Wake Forest University Health Sciences, Winston-Salem, NC, ²Virginia Tech., Blacksburg, VA**4:30PM OP-9-3-3F** - Pregnant Female Anthropometry from Computed Tomography Scan for Finite Element Model DevelopmentK. L. LOFTIS¹, M. G. HALSEY², E. Y. ANTHONY², S. M. DUMA³, AND J. D. STITZEL¹¹VT-WFU Center for Injury Biomechanics, Winston-Salem, NC, ²Wake Forest University School of Medicine, Winston-Salem, NC, ³VT-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^{1,2}¹University of Pittsburgh, Pittsburgh, PA, ²McGowan Institute for Regenerative Medicine, Pittsburgh, PA**3:30PM OP-9-3-4B** Integrating the Prodrug Approach for Therapeutic Interventions at the Neural InterfaceW. HE¹, AND Y. CAO¹¹The University of Tennessee, Knoxville, TN**3:45PM OP-9-3-4C** Biodegradable Electronic Materials and Devices for Neural InterfacesC. J. BETTINGER¹¹Carnegie Mellon University, Pittsburgh, PA**4:00PM OP-9-3-4D** In Situ Analysis of Brain Tissue-Implant InterfacesJ. WILLIAMS¹¹Univ. of Wisconsin- Madison, Madison, WI**4:15PM OP-9-3-4E** Biological Constraints on Reliable Neural InterfacingR. V. BELLAMKONDA¹¹Georgia 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^{1,2}, K. A. POTTER^{1,2}, AND B. GUI^{1,2}¹Case Western Reserve University, Cleveland, OH, ²L. 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. BUTCHER¹¹Cornell University, Ithaca, NY**3:30PM OP-9-3-5B** Introducing Cellular Labs in BME Undergraduate CoursesS. ARCHER¹¹Cornell 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. VOSS¹, AND M. ALI¹¹UT at Austin, Austin, TX**4:00PM OP-9-3-5D** Project Modules in a Course on Cellular BioengineeringA. L. SIEMINSKI¹¹Franklin 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. CLARKE¹, AND P. F. SKIBA²¹Massachusetts Institute of Technology, Cambridge, MA, ²Jersey Shore University Medical Center, Neptune, NJ**4:30PM OP-9-3-5F** Engineers Be Taught To Be Creative?J. TRANQUILLO¹¹Bucknell 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. WIRTZ¹¹Johns 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. ZERVANTONAKIS¹, W. J. POLACHEK¹, J. L. CHAREST², AND R. D. KAMM¹¹Massachusetts Institute of Technology, Cambridge, MA, ²The 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-RUSH¹, S. CAREY¹, J. CALIFANO¹, AND C. REINHART-KING¹¹Cornell University, Ithaca, NY**4:00PM OP-9-3-6D** Cell Stiffness Dictates Cytoskeleton Dependent Cancer Cell Invasion and SignalingV. SWAMINATHAN¹, K. MYTHREYE², E. O'BRIEN¹, G. C. BLOBE², AND R. SUPERFINE¹¹University of North Carolina, Chapel Hill, NC, ²Duke University, Durham, NC**4:15PM OP-9-3-6E** Vascular Recruitment of Retinoblastoma Stem Cells by Multicellular Adhesive Interactions with Circulating LeukocytesY. GENG¹, G. M. SEIGEL², AND M. R. KING¹¹Cornell University, Ithaca, NY, ²State University of New York at Buffalo, Buffalo, NY**4:30PM OP-9-3-6F** Interstitial Flow Affects Invasive Potentials of Metastatic Tumor CellsH. QAZI¹, Z-D. SHI¹, X-Y. JI¹, AND J. M. TARBELL¹¹The 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. MAROM¹, R. HAJ-ALI¹, M. ROSENFELD¹, E. RAANANI², AND H. J. SCHAEFERS³¹Tel-Aviv University, Tel Aviv, Israel, ²Chaim Sheba Medical Center, Tel Hashomer, Israel, ³University 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. GOULD¹, R. SINHA¹, H. AZIZ², R. ROUF², D. JUDGE², AND J. BUTCHER¹¹Cornell University, Ithaca, NY, ²Johns 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. SACKS¹¹University of Pittsburgh, Pittsburgh, PA

4:00PM OP-9-3-7D Vortex Interaction and Dissipation under Edge-to-Edge RepairL. SHI¹, Y. HU¹, AND Z. HE¹¹Texas Tech University, Lubbock, TX**4:15PM OP-9-3-7E** In Vivo Dynamic Stresses in the Functional Mitral ValveC. E. ECKERT¹, M. MORITA², K. KOOMALSINGH², M. MINAKAWA², R. C. GORMAN², J. H. GORMAN III², AND M. S. SACKS¹¹University of Pittsburgh, Pittsburgh, PA, ²University of Pennsylvania, Philadelphia, PA**4:30PM OP-9-3-7F** Remodeling of the Mitral Valve in Response to the Physiological Effects of PregnancyC. PIERLOT¹, A. MOELLER¹, M. LEE¹, AND S. WELLS¹¹Dalhousie 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. SHERIFF¹, G. GIRDHAR¹, M. XENOS¹, J. JESTY¹, AND D. BLUESTEIN¹¹Stony Brook University, Stony Brook, NY**3:30PM OP-9-3-8B** - Dynamic Spreading of Platelets using Reflection Interference Contrast MicroscopyD. LEE¹, K. P. FONG¹, L. F. BRASS¹, AND D. A. HAMMER¹¹University 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. DAYANANDA¹, S. GOGIA¹, G. P. VISENTIN², AND S. NEELAMEGHAM¹¹State University of New York at Buffalo, Buffalo, NY, ²GTI Diagnostics, Waukesha, WI**4:00PM OP-9-3-8D** - Development of a Novel Nano Particle Scaffold to Regenerate Endothelium *In Situ*L-C. SU^{1,2}, R. TRAN^{1,2}, J. YANG^{1,2}, AND K. T. NGUYEN^{1,2}¹University of Texas at Arlington, Arlington, TX, ²University 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. STRONCEK¹, R. LICHENG¹, J. H. LAWSON², B. KLITZMAN¹, AND W. M. REICHERT¹¹Duke University, Durham, NC, ²Duke University Medical Center, Durham, NC**4:30PM OP-9-3-8F** - Thrombogenicity Optimization of Ventricular Assist Devices (VAD) - Case-Study with the HeartAssist 5G. GIRDHAR¹, Y. ALEMU¹, M. XENOS¹, R. BENKOWSKI², M. SLEPIAN³, J. JESTY¹, S. EINAV¹, AND D. BLUESTEIN¹¹Stony Brook University, Stony Brook, NY, ²MicroMed Cardiovascular Inc., Houston, TX, ³University 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. DAROUEUNE¹, AND B. MA²¹University of California, San Diego, La Jolla, CA, ²University of Vermont, Burlington, VT**3:30PM OP-9-3-9B** An Initial Analysis of Enhanced Condensational Growth (ECG) for Respiratory Drug DeliveryG. TIAN¹, G. SU¹, M. HINDLE¹, AND P. W. LONGEST¹¹Virginia 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. KESHAVARZI¹, J. ULTMAN², AND A. BORHAN²¹The Pennsylvania State University, University Park, PA, ²The 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. KABILAN¹, J. P. CARSON², R. E. JACOB², A. P. KUPRAT², K. R. MINARD², R. GLENNY¹, E. M. POSTLETHWAIT³, D. R. EINSTEIN², AND R. A. CORLEY²¹University of Washington, Seattle, WA, ²Pacific Northwest National Laboratory, Richland, WA, ³University 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.¹, AND J. B. GROTBORG¹¹University 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. LIN¹, A. R. LAMBERT¹, M. H. TAWHAI², AND E. A. HOFFMAN¹¹The University of Iowa, Iowa City, IA, ²University 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. WALLER¹, M. J. RAINBOW¹, D. C. MOORE², AND J. T. CRISCO²¹Brown University, Providence, RI, ²Alpert 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. FRIEDMAN¹, A. M. BAILEY¹, AND D. H. KOHN¹¹University 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. HU¹, J. CHENG¹, S. FERRERI¹, F. SERRA-HSU¹, W. LIN¹, AND Y-X. QIN¹¹Stony 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^{1,2}, K. STASCAVAGE¹, M. BROPHY¹, A. LISI¹, T. ERRICO², AND A. RITTER¹¹The Stevens Institute of Technology, Hoboken, NJ, ²NYU Hospital for Joint Diseases, New York, NY**4:15PM OP-9-3-10E** Effects of Muscle Activation on Occupant Kinematics in Frontal Sled TestsS. BEEMAN¹, A. KEMPER¹, M. MADIGAN², AND S. DUMA¹¹Virginia Tech - Wake Forest, Blacksburg, VA, ²Virginia Tech, Blacksburg, VA**4:30PM OP-9-3-10F** The Rat Skull is an "Energy Pathway" to the Brain during Shock Wave ExposureR. BOLANDER¹, C. BIR¹, B. MATHIE¹, AND P. VANDEVORD^{1,2}¹Wayne State University, Detroit, MI, ²John 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. KOTANEN¹, AND A. GUISEPPI-ELIE²¹Clemson University, Anderson, SC, ²Clemson University, Clemson, SC**3:30PM OP-9-3-11B** Magnetoelastic Materials as Novel Bioactive Coatings for Control of Cell AdhesionE. VLAISAVLJEVICH¹, H. HOLMES¹, K. ONG¹, AND R. RAJACHAR¹¹Michigan Technological University, Houghton, MI**3:45PM OP-9-3-11C** In Vivo Glucose Monitoring with Polyethylene Glycole (PEG) Bonded Hydrogel FibersY. HEO^{1,2}, H. SHIBATA^{2,3}, T. OKITSU^{2,4}, Y. TSUDA^{1,4}, T. KAWANISHI^{2,3}, AND S. TAKEUCHI^{1,2}¹The University of Tokyo, Meguro-ku, Tokyo, Japan, ²BEANS Project, Meguro-ku, Tokyo, Japan, ³TERUMO Co., Ashigarakami, Kanagawa, Japan, ⁴Kyoto University, Sakyo, Kyoto, Japan**4:00PM OP-9-3-11D** Large Deflection, Linear Transduction Pressure Sensor for Ventricular ResearchJ. V. CLARK¹, AND A. G. AKINGBA²¹Purdue University, West Lafayette, IN, ²Indiana University, Indianapolis, IN**4:15PM OP-9-3-11E** Surface Plasmon Resonance for Dynamic Analysis of Cell Secreting BehaviorS-H. WU¹, M-T. WEI², A. CHIOU¹, P-K. WEI³, AND X. CHENG²¹National Yang-Ming University, Taipei, Taiwan, ²Lehigh University, Bethlehem, PA, ³Academia Sinica, Taipei, Taiwan, Taiwan**4:30PM OP-9-3-11F** Development of a Minimally Invasive Bladder Pressure Monitoring SystemJ. N. WEAVER¹, J. C. ALSPAUGH¹, AND B. BEHKAM¹¹Virginia 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. SAHA¹, J. HANNA¹, B. PANDO², A. VAN OUDENAARDEN², AND R. JAENISCH¹¹Whitehead Institute/MIT, Cambridge, MA, ²MIT, Cambridge, MA**3:30PM OP-9-3-12B** Proteolytic Activity Matrix (PrAM) Analysis for Simultaneous Determination of Multiple Protease ActivitiesM. A. MILLER¹, L. BARKAL¹, K. JENG², L. G. GRIFFITH¹, AND D. A. LAUFFENBURGER¹¹Massachusetts Inst. of Tech., Cambridge, MA, ²Boston Univ. School of Public Health, Boston, MA**3:45PM OP-9-3-12C** Rapid Miniaturized Assays to Quantify Glycosyltransferase ActivityS. A. PATIL¹, AND S. NEELAMEGHAM¹¹The 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. IZAMIS¹, T. HERMAN¹, B. UYGUN¹, F. BERTHIAUME¹, K. UYGUN¹, AND M. YARMUSH¹¹Massachusetts 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^{1,2}, B. STOJANOVIC^{3,4}, M. KOJIC^{1,5}, A. LIANG⁶, V. J. WEDEEN⁷, AND R. J. GILBERT²¹Harvard School of Public Health, Boston, MA, ²Caritas St. Elizabeth's Medical Center, Boston, MA, ³Research and Development Center for Bioengineering, Kragujevac, Serbia, Yugoslavia, ⁴University of Kragujevac, Kragujevac, Serbia, Yugoslavia, ⁵The University of Texas Health Science Center, Houston, TX, ⁶Massachusetts Institute of Technology, Cambridge, MA, ⁷Massachusetts General Hospital, Charlestown, MA**4:30PM OP-9-3-12F** A Hybrid Game Theoretical Approach for Stochastic Control of Drug Delivery in HIV InfectionJ. WU¹, S. LENAGHAN¹, AND M. ZHANG¹¹University 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. YOON¹, G. Y. LAM¹, B. H. KWAN¹, F. C. CHAO¹, T. P. NICOLAIDES², J. J. PHILLIPS², A. B. MASON³, W. A. WEISS², AND D. T. KAMEI¹¹UCLA, Los Angeles, CA, ²UCSF, San Francisco, CA, ³University of Vermont, Burlington, VT**3:30PM OP-9-3-13B** Nitric Oxide Delivery to Glioblastomas: Specificity and Therapeutic EfficacyS. SAFDAR¹, AND L. J. TAITE¹¹Georgia Institute of Engineering, Atlanta, GA**3:45PM OP-9-3-13C** Development of Enzyme-Activated Nanoconjugates for Hepatic Cancer TherapyS. MEDINA¹, M. CHEVLIKOV¹, D. S. SHEWACH¹, W. D. ENSMINGER¹, AND M. E. EL-SAYED¹¹University of Michigan, Ann Arbor, MI

4:00PM OP-9-3-13D Targeted Virus Nanoparticles for Localized Chemotherapy of Breast CancerF. WEI¹, K. I. MCCONNELL¹, T-K. YU², AND J. SUH¹¹Rice University, Houston, TX, ²The 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. BROOME¹, Y. CHENG¹, J. MEYERS¹, R. S. AGNES¹, M. E. KENNEY¹, C. BURDA¹, AND J. P. BASILION¹¹Case Western Reserve University, Cleveland, OH**4:30PM OP-9-3-13F** Stem Cell-Directed Theranostic Nanovectors for Cancer InterventionJ. O. MARTINEZ¹, F. AMAYA², R. SERDA¹, X. LIU¹, M. FERRARI^{1,3}, M. KOLONIN², AND E. TASCIOTTI¹¹The University of Texas Health Science Center, Houston, TX, ²The University of Texas Health Science Center - Houston, Houston, TX, ³The 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. HOFFMAN¹, C. GRASHOFF¹, M. D. BRENNER², R. ZHOU², M. PARSONS³, M. T. YANG⁴, M. A. MCLEAN², S. G. SLIGAR², C. S. CHEN⁴, T. HA², AND M. A. SCHWARTZ¹¹University of Virginia, Charlottesville, VA, ²University of Illinois, Urbana, IL, ³King's College London, London, SE¹ ¹UL, United Kingdom, ⁴University of Pennsylvania, Philadelphia, PA**3:30PM OP-9-3-14B** Programmed Subcellular to Study the Dynamics of Cell DetachmentB. E. WILDT¹, P. C. SEARSON¹, AND D. WIRTZ¹¹Johns Hopkins University, Baltimore, MD**3:45PM OP-9-3-14C** Mechanical Behavior of Neurons in Live Drosophila EmbryosJ. RAJAGOPALAN¹, A. TOFANGCHI¹, AND T. A. SAIF¹¹University 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. RIBEIRO¹, AND K. N. DAHL¹¹Carnegie Mellon University, Pittsburgh, PA**4:15PM OP-9-3-14E** A Coarse-grained Model of the Functional State of the Nuclear Pore ComplexR. MOUSSAVI BAYGI¹, Y. JAMALI¹, R. KARIMI², AND M. MOFRAD¹¹UC Berkeley, Berkeley, CA, ²Massachusetts 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. CALIFANO¹, AND C. A. REINHART-KING¹¹Cornell 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. PEYTON¹¹MIT, 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. NGUYEN¹, N. SAXENA¹, AND K. ROY¹¹University 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. GUAN¹, F. WANG¹, AND Z. LI¹¹The 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. HAN¹, S. ROW¹, D. D. SWARTZ², AND S. T. ANDREADIS¹¹University at Buffalo, The State University of New York, Amherst, NY, ²Women 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. GRIFFITH¹, A. L'HUILLIER², D. BOLIKAL¹, Y. SHI², J. KOHN¹, AND P. V. MOGHE¹¹Rutgers University, Piscataway, NJ, ²Robert Wood Johnson Medical School, UMDNJ, Piscataway, NJ, ³Robert 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. BORSELLI¹, C. A. CEZAR¹, D. SHVARTSMAN¹, H. H. VANDENBURGH², AND D. J. MOONEY¹¹Harvard University, Cambridge, MA, ²Brown 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. DRINNAN¹, R. S. STOWERS¹, M. A. ALEXANDER¹, AND L. J. SUGGS¹¹University of Texas at Austin, Austin, TX**3:30PM OP-9-3-16B** Sustained Protein Release from Novel Aptamer-Functionalized HydrogelsB. SOONTORNWORAJIT¹, J. ZHOU¹, M. T. SHAW¹, T-H. FAN¹, AND Y. WANG¹¹University of Connecticut, Storrs, CT**3:45PM OP-9-3-16C** Electrospun Fiber – Hydrogel Controlled Release CompositesN. HAN¹, J. JOHNSON¹, K. PARIKH¹, P. BRADLEY¹, A. HISSONG¹, J. LANNUTTI¹, AND J. O. WINTER¹¹The 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. LIANG¹, AND S. T. ANDREADIS¹¹State 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. FAN¹¹The 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. PADERI¹, K. STUART¹, AND A. PANITCH¹¹Purdue University, West Lafayette, IN**3:30PM OP-9-3-17B** Tunable Proteolytic Degradation of Molecularly Engineered PEG Hydrogels to Enhance Cellular InvasionJ. PATTERSON¹, AND J. A. HUBBELL¹¹Ecole 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 QUIROZ¹, AND A. CHILKOTI¹¹Duke University, Durham, NC**4:00PM OP-9-3-17D** Engineering Biomaterial-Associated Complement Activation for Immune ModulationS. N. THOMAS¹, M. A. SWARTZ¹, AND J. A. HUBBELL¹¹Swiss 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. Nguyen¹, M. R. MacEwan¹, L. Li¹, L. V. Wang¹, and D. L. Elbert¹¹Washington 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. HUBER¹, J. LOMAKIN¹, R. THOMAS², Y. ARAKANE³, K. J. KRAMER³, R. W. BEEMAN⁴, M. R. KANOST³, AND S. H. GEHRKE¹¹University of Kansas, Lawrence, KS, ²Haskell Indian Nations University, Lawrence, KS,³Kansas State University, Manhattan, KS, ⁴Grain Marketing and Production Research Center, US Department of Agriculture, Manhattan, KS

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OP – Oral Presentation

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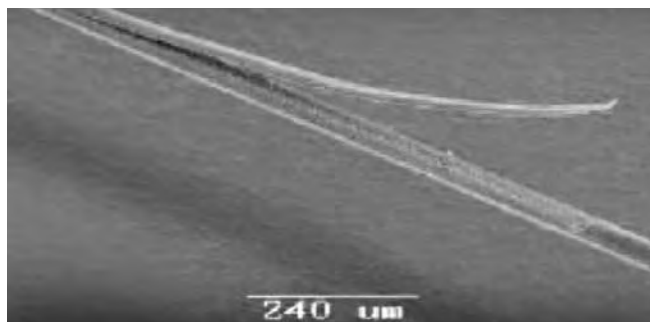
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E milva.ricci@tufts.edu
W www.tufts.edu

Biomedical Engineering at Tufts University draws from core disciplines such as engineering, biology, computer science, physics, chemistry, and physiology emphasizing an interdisciplinary approach to research and education. Strong emphasis is placed on interactions with faculty in Arts and Sciences and the professional schools. The Tissue Engineering Resource Center (TERC) was initiated in August of 2004 as a Resource Center supported through the National Institutes of Health P41 program. The core themes in the Center focus on functional tissue engineering achieved through a systems approach – integrating cells, scaffolds and bioreactors to control the environment *in vitro* for translation *in vivo*.

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EXHIBITS

BOOTH # 109

Tulane University**BIOMEDICAL ENGINEERING**

500 Lindy Boggs Bldg.
New Orleans, LA 70118
P 504-314-2926
E cstewar3@tulane.edu
W www.bmen.tulane.edu

An established department (since 1977) that offers B.S. - Ph.D. degrees. Research includes biomechanics, biotransport, regenerative medicine, biomaterials and devices. Within the School of Science and Engineering, opportunities abound for collaboration with the School of Medicine and numerous centers. Tulane is located in New Orleans, a diverse cultural mecca.

BOOTH # 513

University of Alabama at Birmingham**BIOMEDICAL ENGINEERING**

1075 13th Street South
Birmingham, AL 35294
P 205-482-7003
E pgeorge@uab.edu
W www.uab.edu/bme

The UAB Department of Biomedical Engineering offers undergraduate (BS) and graduate (MS and PhD) opportunities, as well as focused research areas in biomedical implants, imaging, cardiac electrophysiology, tissue engineering, and drug discovery/biotechnology. Significant collaborative research also exists with the UAB Schools of Medicine, Dentistry, Optometry, and other institutional clinical areas.

BOOTH # 107

The University of Arizona**BIOMEDICAL ENGINEERING**

P.O. Box 21240
Tucson, AZ 85721
P 480-965-5485
E SBHSE@asu.edu
W 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
W 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
W 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
W 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
W 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
W 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
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
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
W 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
W 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
W 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 & INNOVATION PROGRAM**

115 Business Loop 70 West
Room 421
Columbia, MO 65203
P 573-884-2058
E jahnsenm@health.missouri.edu
W 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
W 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
W 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
W 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
W 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

W 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

W 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

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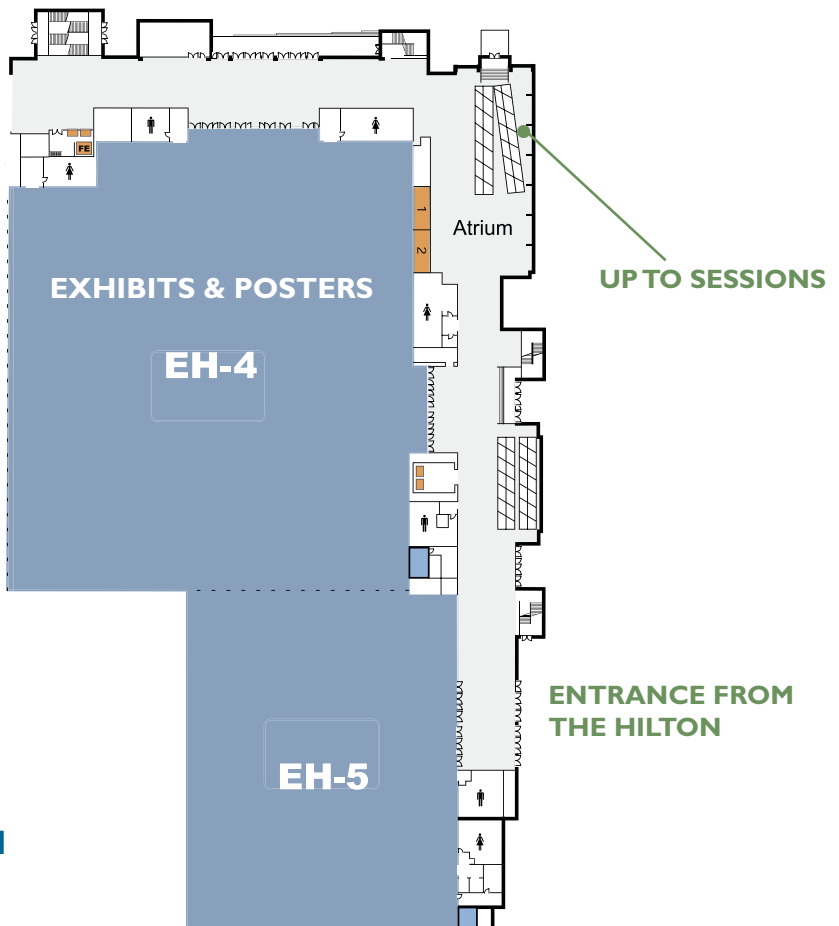
P 941-371-1003

E am@wpiinc.com

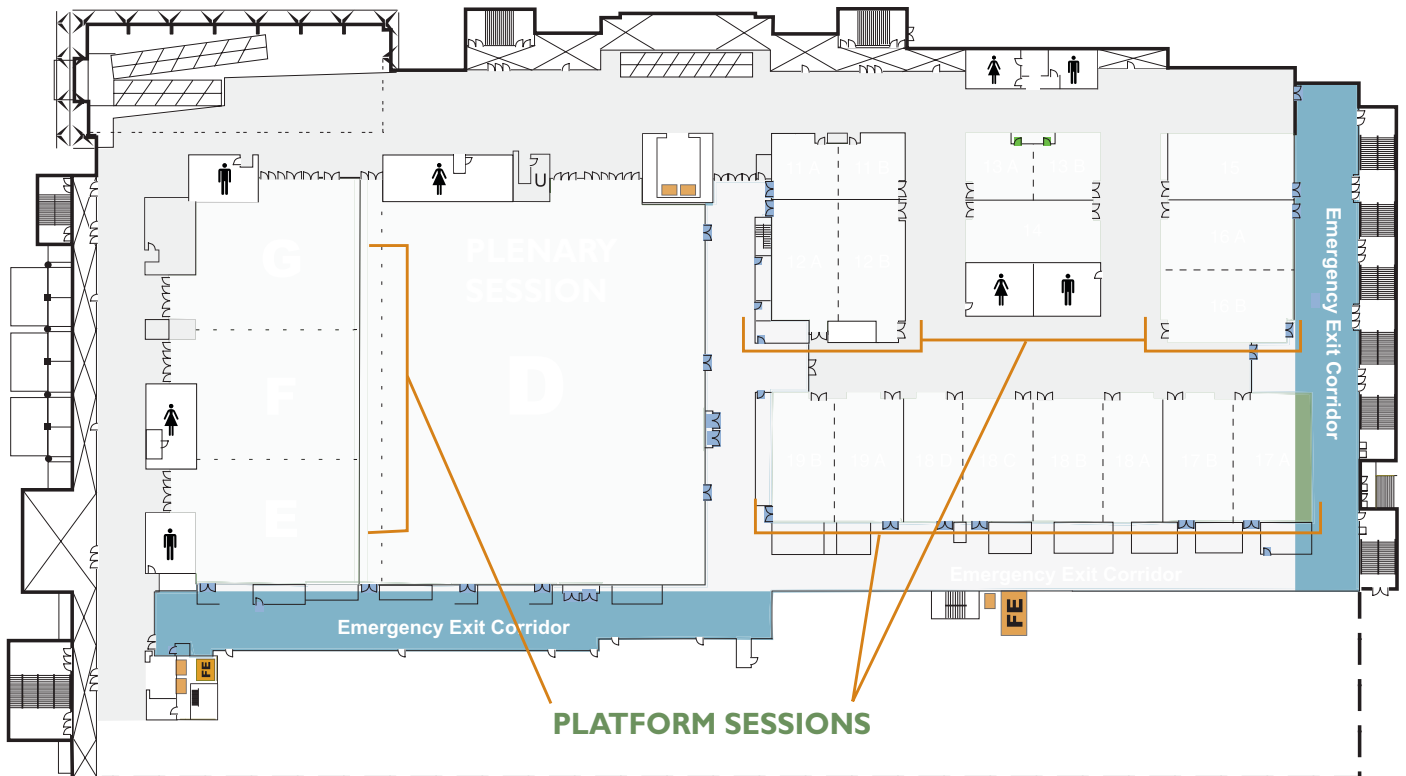
W www.wpiinc.com

Austin Convention Center

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



LEVEL 4 GRAND BALLROOM AND MEETING ROOMS

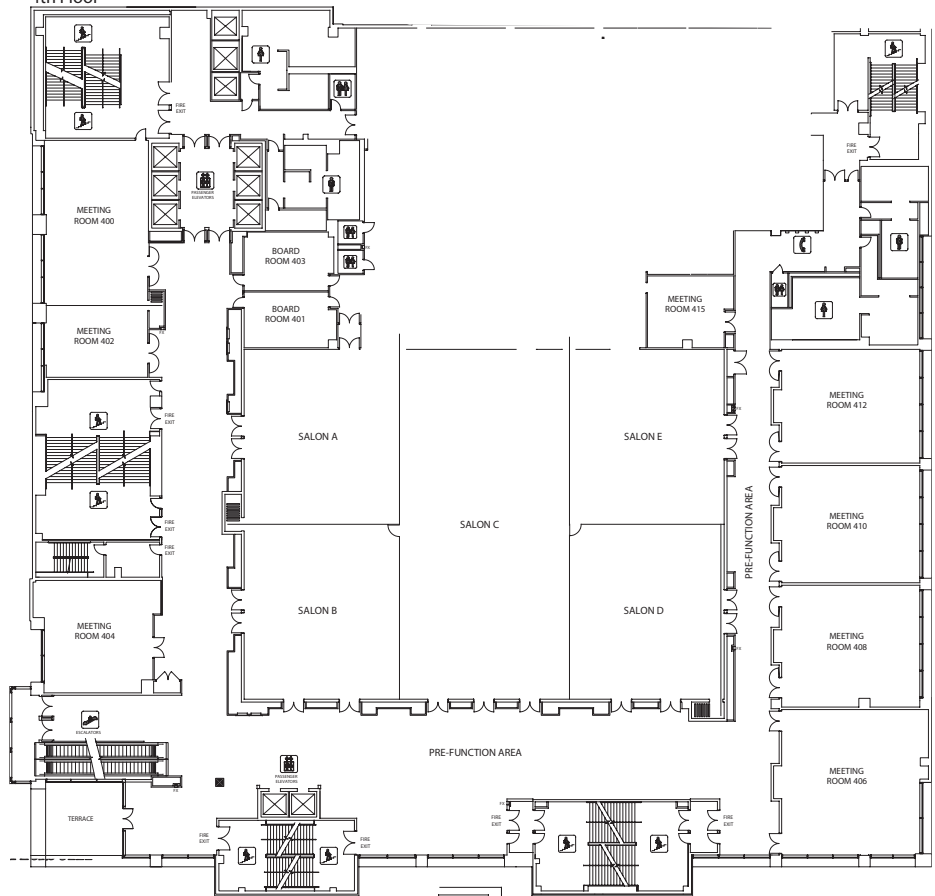


HILTON AUSTIN

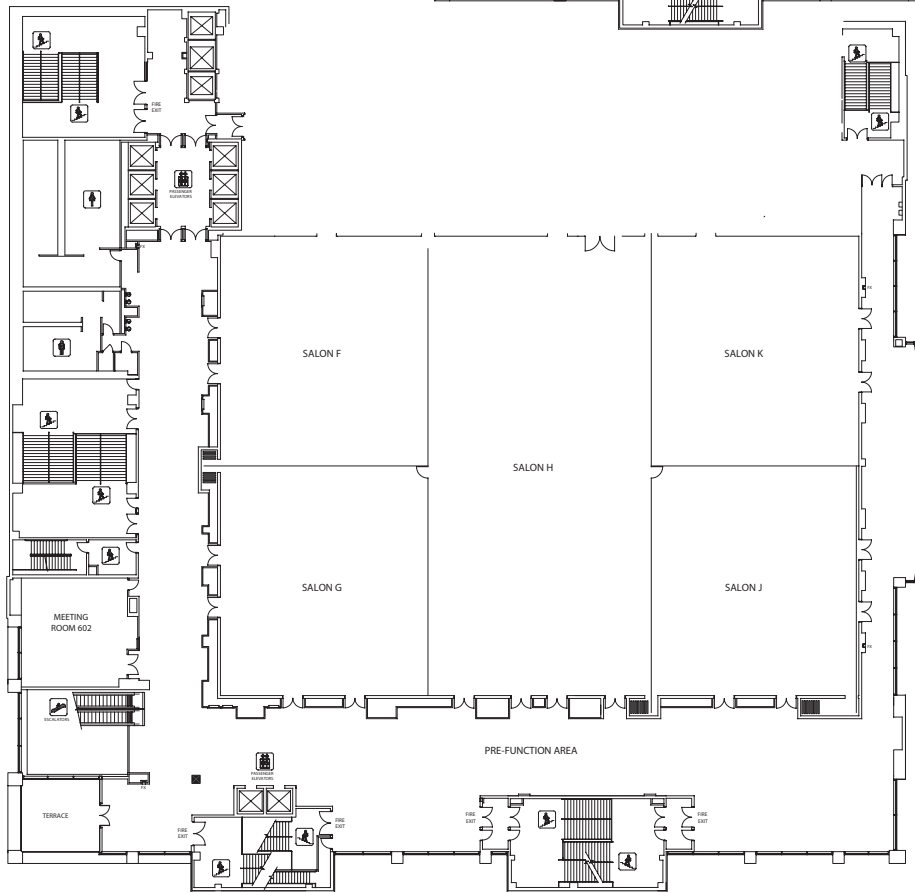
Hilton Austin

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		Cardiovascular Devices – II Room 406	
Biomedical Imaging and Optics	Molecular Imaging I – New Approaches and Technologies Room 12B Imaging in Cancer Using Nanotechnology - I Room 19A	Molecular Imaging II – Synthesis and In Vitro Imaging Room 12B Imaging in Cancer Using Nanotechnology - II Room 19A	Optical and Ultrasound Imaging of Cancer Room 12B CV Imaging Room 19A
Cardiovascular Engineering	Innovations in Cardiovascular Bioengineering I: Cardiac Room 18C Cardiovascular Fluid Dynamics – I Room 18D	Cardiac Electrophysiology Room 18C Cardiovascular Fluid Dynamics – II Room 18D Cardiovascular Tissue Engineering - I Ballroom F	Innovations in Cardiovascular Bioengineering II: Vascular Room 18C Microvasculature, Angiogenesis, and Capillary Patches Room 18D
Cellular and Molecular Engineering	Cellular and Subcellular Imaging Room 18A Cell Adhesion - I Room 18B	Molecular Engineering - I Room 18A Cell Mechanics Room 18B	Molecular Engineering – II Room 18A Mechanotransduction – I Room 18B Acta Biomaterialia Gold Medal Award Session Ballroom G
Devices: Nano to Micro	Biomems and Nanotech for Cellular Engineering Room 16B	Medical Diagnostics: Nano to Micro Devices – I Room 16A Nano to Micro: Fluidic Technologies – I Room 16B	Medical Diagnostics: Nano to Micro Devices – II Room 16A Nano to Micro: Fluidic Technologies – II Room 16B
Drug Delivery and Intelligent Systems	Nucleic Acid Delivery - I Room 14	Nucleic Acid Delivery - II Room 14	Acta Biomaterialia Gold Medal Award Session Ballroom G
Orthopedic and Rehabilitation Engineering	Orthopedic Bioengineering & Imaging Room 17A	Orthopedic Biomaterials Room 17A	Musculoskeletal Cell Mechanotransduction Room 17A
New Frontiers in Bioengineering	Immunobioengineering – I Room 15	Biological Engineering in Cancer Room 15	Synthetic Biology in Health and Medicine Room 15
Neural Engineering	Brain-Computer Interfaces Room 19B Neural Tissue Engineering – I Ballroom F	Motor Neural Prosthetics Room 19B	Engineering the Neural Environment Room 19B
Respiratory Engineering			Complex and Multiscale Behavior in the Lung Room 12A
Systems Biology, Bioinformatics and Computational Biology	High-throughput Computational Biology Room 17B	Signals and Networks in Cancer and Disease - I Room 17B	Molecular and Cellular Design and Evolution Room 17B
Tissue Engineering	Novel Biomaterials and Scaffolds – I Room 12A Nano- and Micro-Engineering in Tissue Engineering – I Ballroom E Neural Tissue Engineering – I Ballroom F Musculoskeletal Tissue Engineering – I Ballroom G	Novel Biomaterials and Scaffolds - II Room 12A Nano- and Micro-Engineering in Tissue Engineering - II Ballroom E Cardiovascular Tissue Engineering - I Ballroom F Musculoskeletal Tissue Engineering – II Ballroom G	Printing and Patterning in Tissue Engineering Ballroom F Acta Biomaterialia Gold Medal Award Session Ballroom G
Other	AIMBE Session , Room 16A Whitaker International Fellows and Scholars Program Hilton, Room 602		Acta Biomaterialia Gold Medal Award Session Ballroom G

Track	10:30am - 12:00noon	1:30pm - 3:00pm
Biomedical Engineering Education		Global Health Room 18A
Biomedical Imaging and Optics	Neuroimaging Room 12B Imaging in Therapeutics - I Room 19A	Imaging in Therapeutics - II Room 12B Biophotonics - I Room 19A
Cardiovascular Engineering	Vascular Permeability Room 18C Heart Valve I: Mechanobiology and Pathology Room 18D	Vascular Structure and Function I: Pathology Room 18C Cardiovascular Computational Modeling and Measurement - I Room 18D Cardiovascular Tissue Engineering - II Ballroom F
Cellular and Molecular Engineering	Cellular Engineering and Modeling Room 18A Cell-Cell Interactions Room 18	Cell Adhesion - II Room 18B
Devices: Nano to Microg	Medical Diagnostics: Nano to Micro Devices – III Room 16A Nano to Micro: Fluidic Technologies – III Room 16B	Drug Delivery Technologies: Nano to Micro Devices - I Room 16A Micro and Nanostructured Biomaterials – I Room 16B
Drug Delivery and Intelligent Systems	Novel Materials & Self-Assembling Systems Room 14 Translational Drug Delivery Room 15	Novel Materials & Self-Assembling Systems: Cancer Applications Room 14
Orthopedic and Rehabilitation Engineering		Rehabilitation Engineering Room 17B
New Frontiers in Bioengineering		Immunobioengineering - II Room 15
Neural Engineering	Neural Modeling Room 19B Neural Tissue Engineering - II Ballroom G	Sensory Neural Prosthetics Room 19B
Respiratory Engineering	Microfluidics and Tissue Engineering Constructs for the Lung Room 17A	Imaging the Lung – The New Frontier Room 17A
Systems Biology, Bioinformatics and Computational Biology	Multiscale Modeling Room 17B	
Tissue Engineering	Cell-Biomaterial Interfaces Room 12A Engineered Tissue Models of Disease Ballroom F Neural Tissue Engineering - II Ballroom G	Cardiovascular Tissue Engineering - II Ballroom F Engineered Tissue Models for Drug Discovery Ballroom G
Translational Biomedical Engineering		Translational Biomedical Engineering 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		Teaching Tools and Strategies Room 18A	Learning Modules and Instructional Materials Room 18A
Biomedical Imaging and Optics	Biophotonics – II Room 19A	Biophotonics – III Room 19A	Imaging Hardware and Software Room 19A
Cardiovascular Engineering	Vascular Structure and Function II: Growth and Remodeling Room 18C Cardiovascular Computational Modeling and Measurement – II Room 18D	Cardiac Stents and Arterial Devices Room 18C Vascular Mechanosignal Transduction Room 18D Cardiovascular Tissue Engineering - III Ballroom F	Heart Valve Biomechanics II: Mechanics and Simulation Room 18C Thrombosis and Hemostasis Room 18D
Cellular and Molecular Engineering	Molecular Engineering – III Room 18A Cell Motility Room 18B	Mechanotransduction – II Room 18B	The Physics and Engineering of Cancer Cells and Their Microenvironment Room 18B Cellular and Subcellular Mechanics Room 15
Devices: Nano to Micro	Drug Delivery Technologies: Nano to Micro Devices – II Room 16A Micro and Nanostructured Biomaterials – II Room 16B	Biosensors, Bio-Interfaces and Implantable Devices – I Room 16A Emerging Concept of Medical Micro Devices Room 16B	Biosensors, Bio-Interfaces and Implantable Devices – II Room 16A
Drug Delivery and Intelligent Systems	Drug Delivery Technologies: Nano to Micro Devices – II Room 16A Micro and Nanostructured Biomaterials – II Room 16B	Targeted Drug Delivery – II Room 14	Targeted Drug Delivery – III Room 14
Orthopedic and Rehabilitation Engineering	Orthopedic Soft Tissue Biomechanics Room 17B	Orthopedic Hard Tissue Biomechanics Room 17B	Skeletal Biomechanics Room 17B
New Frontiers in Bioengineering		Integrated Cellular Systems Room 15	Systems – Level Approaches in Bioengineering Room 16B Cellular and Subcellular Mechanics Room 15
Neural Engineering	Neural Control of Movement Room 19B	Neural Engineering Technology Room 19B	Neural Electrode Tissue Interface Room 19B
Respiratory Engineering	Acute Lung Injury from Cell to System Room 17A	Mechanobiology in the Lung Room 17A	Lung Computational Fluid Dynamics and Particle Deposition Room 17A
Systems Biology, Bioinformatics and Computational Biology	Modeling of Biomolecules and Their Interactions Room 12B	Signals and Networks in Cancer and Disease – II Room 12B	Systems Cell Biology Room 12B
Tissue Engineering	Stem Cells and Tissue Engineering – I Ballroom E Host Response to Biomaterials Ballroom F Cell- and Gene-Based Therapeutics Ballroom G	Novel Biomaterials and Scaffolds – IV Room 12A Stem Cells and Tissue Engineering – II Ballroom E Cardiovascular Tissue Engineering – III Ballroom F Bioreactors and Bioprocessing in Tissue Engineering Ballroom G	Novel Biomaterials and Scaffolds – V Room 12A Stem Cells and Tissue Engineering – III Ballroom E Controlled Release in Tissue Engineering Ballroom F Bioinspired Materials Ballroom G
Translational Biomedical Engineering	Novel Biomaterials and Scaffolds – III Room 12A		
Undergraduate	Undergraduate Research I Room 13B	Undergraduate Research II Room 13B	

SCHEDULE AT-A-GLANCE

	7am	8am	9am	10am	11am	12pm	1pm	2pm	3pm	4pm	5pm	6pm	7pm	8pm	9pm	10pm	
Wednesday, October 6, 2010 Pre-conference Workshop <i>pre-registration required</i> Convention Center, Room 12A		8:30am - 5:00pm Industry Academia Clinician Collaboration for Medical Innovation: Reinventing the Wheel															
Pre-conference Workshop <i>pre-registration required</i> Convention Center, Room 12B		8:30am - 2:30pm BME Council of Chairs Educational Workshop															
Exhibits & Posters Set-Up Convention Center, Hall 4			10:00am - 5:00pm														
Meet the Faculty Candidate Poster Session Convention Center, Hall 4									3:00pm - 5:00pm								

Registration Convention Center, Hall 4 7:00am - 5:00pm	Speaker Ready Room Room 13A	BMES Board of Directors Meeting Hilton, Salon AB 8:30am - 4:30pm	Council of Chairs Meeting & Dinner University of Texas, BME Building 5:30pm - 9:30pm
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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
Plenary Session <i>Pritzker Distinguished Lecturer</i> Convention Center, Ballroom D <i>see page 9 for details</i>		8:00am – 9:30pm														
Exhibit Hall Open Convention Center, Hall 4			9:30am - 5:00pm													
Poster Sessions 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									
Platform Sessions 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						
Scheduled Breaks			9:30am - 10:30am			Lunch (on own) 12:00pm - 1:30pm			3:00pm - 4:00pm							
Celebration of Minorities in BME Luncheon <i>Additional ticket purchase required</i> Hilton , Salon G						12noon – 1:30pm										
Career Alumni Panel Convention Center										4:00pm - 5:30pm						
Resume Review/ Writing Workshop Convention Center											5:45pm – 7:15pm					
BMES Business Meeting & Award Ceremony Convention Center, Ballroom D											5:45pm – 7:15pm					
Welcome Reception Hilton, Salon JK													7:30pm – 8:30pm			
University Receptions <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
Friday October 8, 2010 Plenary Session <i>BMES Distinguished Achievement Lecturer Award</i> Convention Center, Ballroom D		8:30am - 9:30am														
Exhibit Hall Open Convention Center, Hall 4 9:30am - 1:00pm			9:30am - 5:00pm													
Poster Sessions 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									
Platform Sessions <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									
Scheduled Breaks Convention Center, Hall 4			9:30am - 10:30am			Lunch (on own) 12:00pm - 1:30pm			3:00pm - 4:00pm							
BMES Student Chapter Development Workshop Convention Center, Ballroom E				10:30am - 11:30am				1:30pm - 2:30pm								
BMES Student Leader Workshop Convention Center, Ballroom E																
Women in BMES Presentation & Luncheon <i>Additional ticket purchase required</i> Hilton, Salon AB						12:00pm - 1:30pm										
Career Fair Convention Center, Hall 4							1:00pm - 4:00pm									
Distinguished Speakers Plenary Session <i>Future Frontiers of Biomedical Engineering</i> Convention Center, Ballroom D										4:00pm - 6:00pm						
Special Event Bullock Museum												6:30pm - 9:30pm				

Registration Convention Center, Hall 4 7:00am - 6:00pm	AEMB Annual Ethics Session Hilton, 602 10:00am - 11:00am	AIBME Academic Council Meeting Hilton, 406 10:00am - 12:00pm	CMBE Editorial Board Lunch <i>Invitation Only</i> Marriott Downtown Courtyard 12:00pm - 1:30pm	2011 BMES Annual Meeting Committee Meeting 9:30am - 11:00am Convention Center, Room 13B	AEMB Public Policy Forum Hilton, 602 2:30pm - 3:30pm
Speaker Ready Room 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
Saturday, October 9, 2010 Plenary Session <i>Rita Schaffer Young Investigator Lecture</i> Diversity Award Winner Convention Center, Ballroom D		8:00am – 9:30am														
Exhibit Hall Open Convention Center, Hall 4 9:30am – 1:00pm			9:30am – 1:30pm													
Poster Session Convention Center, Hall 4 <i>see pages 108-117, and 118-125 for details</i>			Session 9A 9:30am - 1:00pm													
Platform Sessions 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							
Scheduled Breaks			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

