2017 BMES Annual Meeting
October 11–14, 2017
Phoenix Convention Center
Phoenix, Arizona

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Phoenix | BMES 2017
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UPCOMING WEBINARS

October 2017

How to Sustain a BMES Student Chapter
(featuring 2017 Chapter Award Winners)

November 15, 2017 @ 3:00 pm EST
Connecting Leaders in BME with Underrepresented Groups

December 11, 2017 @ 1:00 pm EST
Advanced Biomanufacturing SIG Webinar: Tissue Biofabrication

ARCHIVED WEBINARS

How to Engage Industry More Effectively with Local Chapters
Current Topics in BME ABET Accreditation
Launching a Start-Up from a University
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Senate Proclamation

WHEREAS, the Board of Advisors is committed to supporting, developing and recognizing innovative medical, dental and biological engineers through the Biomedical Engineering Society (BMES) and therefore declares the following:

NOW, THEREFORE, the Senate hereby recognizes the achievements, contributions, and innovations in the field of biomedical engineering and hereby proclaims this 24th day of March 2017, as

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#BMESfifty
Welcome to Phoenix and the 2017 Annual Meeting of the Biomedical Engineering Society (#BMES2017)! With this large number of attendees, sold-out exhibitor space and countless sponsors, this is an exciting time to be a part of BMES and the biomedical engineering community. As you navigate the BMES #BMES2017, I encourage you to use every opportunity to exchange ideas and information, network for professional development, take on new learning, and interact with old and new colleagues.

The theme of this year’s meeting is “Engineering personalized medicine and therapies.” Cleverly constructed by our co-chairs, Kevin Otto and Shelly Sakiyama-Elbert, and dedicated BMES staff, the scientific and professional development program reflects our individual and collective goals that our work, in research, education and in practice, should improve the health and well-being of others.

Over the next four days, give special attention to our impressive line-up of the keynote speakers. Things kick-off Thursday morning with Gordana Vunjak-Novakovic delivering the Robert A. Pritzker Distinguished Lecture. A BMES Fellow, Dr. Vunjak-Novakovic is a leading expert in engineering of human tissues for regenerative medicine, stem cell research and study of disease. BMES is delighted to collaborate with NIH to recognize the pioneering on CRISPR-Cas work of Dr. Feng Zhang, speaking as the NIBIB Lecturer on Thursday afternoon. On Friday, we have Bonnie Anderson, chairman and CEO of Veracyte, delivering the Wallace H. Coulter Award for Healthcare Innovation Award Lecture and Dr. Manu O. Platt, for the BMES Diversity Award Lecture. Stick around for Saturday morning to see Dr. Craig J. Goergen receive the Rita Schaffer Young Investigator Award, and deliver this important lecture.

Just a glance at our tracks shows how diverse is the research in the BME field, but also the breadth of our pursuits and interests. We have programs tailored to support education for our undergraduate and graduate engineering students, and even for visiting high school students who come with curiosity and questions. We have programming options for junior researchers trying to navigate the complex world of research funding, job applications, and career advancement. And the programming for career professionals in corporate and start-up sectors has grown exponentially in recent years, with sessions highlighting entrepreneurship, project management, regulatory developments, and engineering solutions for health care disparities, to name just a few. Look for programs hosted by our Special Interest Groups (SIGs) and affiliate bodies, including ABET.

When you walk around the meeting for the next four days, take note of the diversity of our attendees. With membership exceeding 45% women, we are already the most diverse discipline in engineering, and BMES has been committed to expanding both representation and inclusion. The NIH and NSF, as well as Coulter Minority Network, are supporting programming for and participation of diverse engineers in BME, and we can celebrate increased participation from industry representatives in meeting attendance and in our BMES leadership. From its inception, BMES has been committed to diversity and research, and we are partnering with these agencies and the National Society of Black Engineers to achieve our goals.

This year’s meeting also marks the kickoff of celebratory activities for the Society’s 50th Anniversary in 2018. Everyone attending this year’s meeting should take pride in the growth and strength of our community after 50 years of BMES. BMES is successful and now embraced by our national and professional community due to your efforts. The work you do in design, research, and product development, the time you spend mentoring and educating, and your volunteer work in supporting the Society locally and globally is why BMES remains relevant today. Make sure you stop by the BMES booth to get one of the 50th Anniversary giveaways and to participate in the sponsorship and contest opportunities.

I hope you will benefit from the many learning opportunities that we’ve designed for BMES #BMES2017, and the expert talks in all the platform sessions and poster presentations. The ambitious work being conducted across the entire field of BME, as well as that by our brilliantly creative students, will both energize you and leave you with new thinking.

Join me in thanking our Conference Co-Chairs Shelly Sakiyama-Elbert and Kevin Otto, BMES Staff, NSF, NIH, our sponsors and our meeting attendees. Let’s make it an enjoyable and productive meeting!
Welcome to the 2017 Annual Meeting of the Biomedical Engineering Society in Phoenix, Arizona. We are excited to host you in this rapidly growing bioscience and healthcare technology hub in the Valley of the Sun. Arizona is a land of opportunity for Bioscience and Health Care innovation. The state has invested over $1 billion in local biomedical research and development, including the Biodesign Institute at Arizona State University and the BIOS Institute at the University of Arizona. We hope that you will take advantage of the local industry tours, which include Medtronic, Abbott, and Project C.U.R.E., as part of the BMES meeting. Enjoy your time in the 5th largest city in the United States and our largest state capitol.

This year’s meeting theme is Engineering Personalized Medicine and Therapies. To showcase this theme, our two plenary speakers will highlight cutting edge technologies in genome engineering and diagnostics. Feng Zheng, from MIT/Broad Institute, will deliver the BMES-NIBIB Plenary Lecture on Thursday evening. Dr. Zheng is well known for his role in developing optogenetics technology and for demonstrating that the CRSPR-Cas9 system could be used for genome editing of mammalian cells. The following morning Bonnie Anderson, Chair of the Board and CEO of Veracyte, will receive the Wallace H. Coulter Award for Healthcare Innovation and deliver a Plenary Lecture. Veracyte is a pioneering genome diagnostics company that focuses on reducing the diagnostic ambiguity in health care. Ms. Anderson co-founded the company in 2008, and their tests are now the standard of care for thyroid and lung cancer diagnosis. We are very excited and honored to host both of these leaders in biomedical engineering and we look forward to hearing their perspective on engineering personalized medicine and therapies.

We are excited to include several member initiated special sessions from the BMES community. These include topics on training such as: Training new leaders in healthcare innovation and Defining educational goals of bioengineering for the 21st Century on Thursday, as well as Curricular Innovation on Friday. We will also feature internationally focused sessions including the 5th US-Korea Joint BMES Workshop and the International Symposium on Biomedical Engineering. We will have several sessions on how to prepare research proposals for NSF including CAREER Awards and Graduate Research Fellowships.

We have an outstanding program for Students and Early Career Engineers that includes a pre-meeting orientation on Wed. afternoon and mentoring sessions. Thursday and Friday, there are sessions on networking and careers in academia, industry and entrepreneurship. Our Industry Committee has done a wonderful job putting together tours of local industry, as well as sessions on project management, validation of medical devices, and entrepreneurship. We have expanded the university receptions to Thursday and Friday night to accommodate more networking opportunities. Join us for the BMES Bash at the Arizona Science Center on Friday night. Enjoy some dessert, networking and over 300 interactive exhibits. The Science Center is just a short 6 minute walk from the Phoenix Convention Center.

In recognition of the diversity within BMES, we will have two celebration luncheons and a dessert banquet. All of these events welcome all BMES community members who wish to support diversity and all require a ticket. The Celebration of Minorities in BME Luncheon on Thursday features a keynote lecture by Antonio Garcia on creating more inclusive environments in engineering. On Friday, the Celebration of Women in BME Luncheon will feature a keynote by Christopher Loving on “moving from the urgent to the important”. On Wednesday evening, The LGBT Dessert Social will feature a talk from Naomi Chesler on Being an Ally.

Together with our 36 track chairs, who represent a diverse set of BMES members, we are excited to bring you a record number of 929 oral and 1899 poster presentations over the 4 days of the meeting. We are grateful for efforts of the track chairs in coordinating the review of a record number 3054 of abstracts. Thank you to the session chairs for helping to keep our many concurrent sessions running smoothly. We also have a record-breaking number of exhibitors (125) who will showcase the breadth and enthusiasm of biomedical engineering training and industry.

We are indebted to the tireless work of Debby Tucker behind the scenes to keep all the administrative aspects of the meeting running. Thank you also to Michele Ciapa and Lori Setton for their grant writing and funding raising efforts to support many of the special events throughout the meeting and to support our trainees.

We look forward to seeing you all in Phoenix and participating in what will be an outstanding meeting of Biomedical Engineers!

Shelly Sakiyama-Elbert, PhD
Annual Meeting Co-Chair
Professor and Chair
Department of Biomedical Engineering
The University of Texas at Austin
Austin, Texas

Kevin J. Otto, PhD
Annual Meeting Co-Chair
Associate Professor
J. Crayton Pruitt Family Department of Biomedical Engineering
University of Florida
Gainesville, Florida
**Robert A. Pritzker Distinguished Lecture**

**Gordana Vunjak-Novakovic, PhD**

University Professor
The Mikati Foundation Professor of Biomedical Engineering and Medicine
Director, Laboratory for Stem Cells and Tissue Engineering
Columbia University in the City of New York

Thursday, October 12, 2017
10:15 am—11:30 am
North Ballroom BCD
Phoenix Convention Center

**Engineering Human Tissues for Regenerative Medicine and Study of Disease**

**Gordana Vunjak-Novakovic** is the University Professor (Columbia University highest rank held by only eight active professors), and The Mikati Foundation Professor of Biomedical Engineering and Medicine. She is a leading expert in engineering of human tissues for regenerative medicine, stem cell research and study of disease. With over 35,000 citations and h=109, she is one of the most highly cited individuals of all times, in all disciplines. She founded three biotech companies (epibone.com, tarabiosystems.com, eastriverbio.com). Among her recognitions, she is a Fellow of AAAS and BMES, and an elected member of the Academia Europaea, National Academy of Engineering, National Academy Medicine, and National Academy of Inventors.

Tissue engineering is becoming increasingly successful with authentically representing the actual environmental milieu of the development, regeneration and disease. A classical paradigm of tissue engineering is related to the integrated use of human cells, biomaterial scaffolds (structural and logistic templates for tissue formation) and bioreactors (culture systems providing environmental control, molecular and physical signaling) in regenerative medicine. Living human tissues can be bioengineered from the autologous stem cells, and tailored to the patient and the medical condition being treated. More recently, the same principles are being successfully applied to the patient-specific “organs on a chip” platforms designed to recapitulate some aspects of human physiology. This talk will discuss some recent advances in regenerative engineering of whole organs (lung, heart, bone) and the modeling of systemic pathologies using functional human tissues grown in lab.

**NIH NIBIB Lecture**

**Feng Zhang, PhD**

W.M. Keck Center Development Professor of Biomedical Engineering
Department of Brain and Cognitive Sciences
Department of Biological Engineering
Massachusetts Institute of Technology
Cambridge, Massachusetts

Thursday, October 12, 2017
5:30 pm–6:30 pm
North Ballroom BCD
Phoenix Convention Center

**From Microbial Immunity to Genome Editing**

The microbial CRISPR-Cas adaptive immune systems provide archaea and bacteria with a programmable defense against invading nucleic acids. Several years ago, we and others reported that the effector module from Streptococcus pyogenes CRISPR-Cas9 (SpCas9) could be harnessed for genome editing. Following this work, we have discovered, characterized, and engineered additional Cas enzymes for use as molecular biology tools. These include a novel class of CRISPR-Cas systems that use RNA-guided RNases, such as Cas13a (C2c2) and Cas13b. Leveraging the natural properties of Cas13a, we developed a single-molecule nucleic acid sensing platform termed SHERLOCK, which can be used for rapid pathogen detection and genotyping. We are continuing to explore microbial diversity to identify novel enzymes and systems that could serve as the basis for development of additional molecular biology tools and applying these tools to tackle complex biological questions.

Feng Zhang obtained his A.B. degree in Chemistry and Physics from Harvard University and his Ph.D. degree from the Department of Bioengineering at Stanford University, where he worked in the lab of Karl Deisseroth on the development of optogenetics. In 2011, Zhang began his own lab at the Massachusetts Institute of Technology (MIT), pioneering the use of CRISPR-Cas systems as genome editing tools. He and his team successfully harnessed the RNA-guided nuclease Cas9 for mammalian genome editing. Following this, the Zhang lab has continued to expand and refine Cas-based approaches, helping to create a robust genome engineering toolbox that is accelerating research around the world. He is currently a Core Member of the Broad Institute of MIT and Harvard; an Investigator of the McGovern Institute for Brain Research at MIT; a James and Patricia Poitras Professor of Neuroscience, an Associate Professor in the Departments of Brain and Cognitive Sciences and Biological Engineering at MIT, and a New York Stem Cell Foundation-Robertson Investigator.
Veracyte, including how the wealth of diverse, hands-on experiences can be extracted from the genome through diagnostic tests, what matters to physicians, patients and health plans is finding clinically useful information that changes patient care and improves outcomes.

Using that simple framework, Bonnie Anderson founded Veracyte and, in less than 10 years, has built it into one of the most successful genomic diagnostics companies in the space today. Veracyte’s three commercialized tests have saved tens of thousands of patients from risky, expensive and often-unnecessary surgery just to get a diagnosis and collectively target a $2 billion market opportunity. The company is setting new standards for successfully obtaining health plan reimbursement for its tests – which has traditionally been the biggest hurdle to moving genomic diagnostics company that is fundamentally improving patient care.

Bonnie H. Anderson is Chief Executive Officer and Chairman of the Board of Veracyte, a pioneering genomic diagnostics company that is fundamentally improving patient care by reducing diagnostic uncertainty - without the need for risky, costly and often-unnecessary surgery. Her career spans over 30 years in regulated diagnostics and life science markets. Ms. Anderson cofounded Veracyte in 2008 and served as the company’s President and Chief Executive Officer until 2016, when she was also appointed Chairman of the Board. She took the company public in 2013 and has spearheaded Veracyte’s commercialization successes to date.

Prior to Veracyte, Ms. Anderson provided strategic consulting services to venture capital firms and early-stage businesses following 18 years in leadership positions at Beckman Coulter. She serves on the board of Castle Bioiences and on the steering committee for the Coalition for 21st Century Medicine and is a trustee emeritus of the Keck Graduate Institute of Applied Life Sciences. She graduated from Indiana University of Pennsylvania with a Bachelors of Science degree in Medical Technology and in 2012 was honored with a “Distinguished Alumni” award. In 2015, Fast Company magazine named Ms. Anderson to its “100 Most Creative People in Business” list. She was named one of the “Most Influential Women in Bay Area Business” (2013) and one of the “Bay Area’s Most Admired CEOs” (2014) by the San Francisco Business Times, and has also received the Silicon Valley Business Journal’s “Women of Influence” award (2013).

The Journey from an Idea to Transforming Patient Care with Genomic Diagnostics

The Wallace H. Coulter Award for Healthcare Innovation Award Lecture

Bonnie Anderson
Chairman and Chief Executive Officer
Veracyte

Friday, October 13, 2017
10:15 am – 11:15 am
North Ballroom BCD
Phoenix Convention Center

The Wallace H. Coulter Award for Healthcare Innovation recognizes an outstanding individual who has demonstrated a lifetime commitment to and made important contributions to patient healthcare.

The Danger of Acting Now

Dr. Platt’s lecture will address the fear of waiting for the perfect time to be impactful in diversity and inclusion. As a member of an under-represented group, the opportunity for impact is magnified, as is the visibility, responsibility, perceived consequences of failure, and ultimately, the perceived danger of acting now. Sage professional mentors and family elders may advise “going along to get along” and “not making waves” to be successful. Dr. Platt will challenge this assumption of the “safe” path to success. Often, if you are the first or the only of a particular demographic category, the path is neither well paved, nor well lit, and GPS does not seem to recognize your location. Dr. Platt will discuss the power and the payoff of being unapologetic about identity, and being intentional in diversifying the workforce. Now, not waiting until it is safe.

Dr. Manu Platt earned his B.S. in Biology from Morehouse College in 2001 and Ph.D. from Georgia Tech’s Emory joint program in biomedical engineering in 2006, and post-doctoral training at MIT. Then he returned to Georgia Tech/Emory in January 2009 to start his independent tenure track career, and was promoted and tenured in 2015. Dr. Platt’s research focuses on proteolytic mechanisms of tissue remodeling using experimental and computational approaches. These diseases of focus are health disparities in the U.S., but global health concerns: sickle cell disease, breast cancer, and HIV mediated cardiovascular disease, which has taken him to South Africa and Ethiopia for to find solutions for low resource settings. His work has been funded by NIH Director’s New Innovator Award, International AIDS Society, Georgia Cancer Coalition, and the National Science Foundation, and he trains a diverse cadre of students and postdocs to complete this work. He is also a co-investigator and the Diversity Director for the NSF Science and Technology Center on Emergent Behaviors of Integrated Cellular Systems (EBICS), a joint center between Georgia Tech, MIT, and UIUC. Integrated with his research program are his mentoring goals of changing the look of the next generation of scientists and engineers to include all colors, genders, and backgrounds. Aligned with that goal, Dr. Platt, with Bob Nerem, co-founded and co-directs Project ENGAGES (Engaging the Next Generation At Georgia Tech in Engineering and Science), a program for African-American high school students in the Atlanta Public School system, trained and paid well above minimum wage, to be researchers in Georgia Tech labs.

Dr. Platt was named an Emerging Scholar by Diverse: Issues in Higher Education magazine in 2015 and chosen for “Atlanta 40 under 40” by the Atlanta Business Chronicle in 2016 for his activities at Georgia Tech and his outreach activities in the broader Atlanta community. “Change will not come if we wait for some other person or some other time. We are the ones we’ve been waiting for. We are the change that we seek.” - Barack Obama

BMES Diversity Award Lecture

Manu O. Platt, PhD
Associate Professor, Diversity Director, STC on Emergent Behaviors of Integrated Cellular Systems (EBICS), GRA Distinguished Scholar
Wallace H. Coulter Department of Biomedical Engineering at Georgia Tech and Emory
Atlanta, Georgia

Friday, October 13, 2017
5:15 pm – 6:15 pm
North Ballroom BCD
Phoenix Convention Center

We are the change that we seek.” - Barack Obama

BMES DIVERSITY AWARD LECTURE—FRIDAY—5:15 PM
Small Animal Cardiovascular Imaging for Engineers

Cardiovascular disease is the leading cause of death and disability in the world. Non-invasive imaging has become vital for the detection and monitoring of disease progression, aiding in the development of therapeutics and devices. The research highlighted in this talk describes advancements at the interface of engineering and medicine in order to develop and use multiple imaging modalities to better understand cardiac and vascular disease. For example, conventional ultrasound measurements are commonly based on geometric assumptions from 2D images, often yielding inaccurate results with large variability. Because of this, we have developed a respiratory- and cardiac-gated 3D echocardiography technique to reconstruct ultrasound volumes. We imaged 1) the left ventricles of healthy and infarcted wild-type mice and 2) the abdominal aortas of hyperlipidemic mice with angiotensin II-induced dissecting aneurysms using a position-controlled ultrasound transducer. ECG-gated cine loops at 1000 frames-per-second were acquired at sequential positions and temporally concatenated, generating 4D datasets. Nonlinear image registration was then utilized to calculate deformation fields and project segmented masks across the cardiac cycle and from aneurysmal vessels. Volume renderings of left-ventricular masks yielded ejection fractions of 73±6% and stroke volumes of 31±6μL. In the abdominal aorta, Green-Lagrange circumferential cyclic strain decreased significantly from healthy to aneurysmal regions. The dissecting aneurysm datasets were also used to run detailed hemodynamic simulations over large portions of the abdominal vasculature that include small branching vessels. The results suggest that differences in morphology, kinematics, and hemodynamics play crucial roles in determining the evolution of both ischemic heart disease and dissecting abdominal aortic aneurysms.

Dr. Craig Goergen is the Principal Investigator of the Cardiovascular Imaging Research Laboratory at Purdue University. His work combines advanced engineering, imaging, and biological approaches to study a variety of cardiac and vascular diseases. With funding from the NIH, NSF, AHA, and industry, Dr. Goergen and his team are working to improve cardiovascular disease diagnosis, treatment, and prevention, ultimately providing patients with longer and more fulfilling lives. Dr. Goergen received a bachelor’s degree in biomedical engineering from Washington University in St. Louis and master’s and doctoral degrees in bioengineering from Stanford University. In graduate school, Dr. Goergen worked with the Biomedical Imaging Group at Genentech to study abdominal aortic aneurysm formation in multiple mouse models. His postdoctoral training in molecular optical imaging at Harvard Medical School focused on cardiac disease and left ventricular remodeling. He joined the faculty at Purdue University in December of 2012 and is passionate about research, education, and student mentorship.
Congratulates the 2017 CMBE Young Innovators!

October 2017 issue, edited by Michael King, Alyssa Panitch, and Richard Waugh

See the Young Innovators present their work on Friday, October 13, 2017 at 1:15 and 3:30pm!

Become a 2018 CMBE Young Innovator! Next competition is underway. Accepted authors will be invited to present their work in a special two-part platform session at the 2018 BMES Annual Meeting.

To be eligible, candidates must hold a position at the Assistant Professor level or equivalent. BMES non-members are eligible and welcome. Self nominations should include title with 250-word structured abstract, and a 2-page NIH-style biosketch, emailed to mike.king@vanderbilt.edu.

Key Dates for 2018 Young Innovators issue:
Nomination Deadline: November 10, 2017
Abstract Acceptance: December 15, 2017
Manuscript Submission: February 15, 2018
Print Publication: October 2018
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AZBio is Arizona’s statewide champion for the biomedical industry. AZBio Members include leading universities, hospital systems, municipalities, global industry leaders, exciting entrepreneurial ventures, patient advocates and a community committed to discovering, developing and delivering innovations that make life better by leveraging Arizona’s Collaborative Gene.

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The Department of Biomedical Informatics (BMI) upholds a strong partnership among academic researchers, clinical practitioners, and regional health care providers in the advancement of research and education in biomedical informatics. We offer a Bachelors, Masters and PhD in Biomedical Informatics, as well as a MAS in Health Informatics (100% Online).

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The Binghamton University Department of Biomedical Engineering provides a state-of-the-art, affordable education. We train the next generation of biomedical engineers, cultivate leaders, and foster entrepreneurship through the integration of engineering principles, medical science, and biology towards an improved understanding of biophysical phenomena, healthcare systems, disease prevention, diagnostics, and treatment.

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Boston University’s Department of Biomedical Engineering is one of the largest and oldest departments of its kind in the country. We attract exceptional students to our BS, MS, and PhD degree programs, which are known for their highly quantitative approach. We have strengths in numerous research areas including Biomechanics and Mechanobiology, Molecular, Cellular and Tissue Engineering, Neural Engineering, Synthetic and Systems Bioengineering, Biomedical Imaging, Nanotechnology and Sensing, Computational Modeling and Data Sciences, and Biomaterials. We boast a wealth of research resources and have strong ties with the BU School of Medicine as well as other top medical research centers in the Boston area.

Booth #320

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The Center for Biomedical Engineering at Brown University features an interdisciplinary approach in three complementary research areas: Mechanobiology, Regenerative Engineering, and Neuroengineering. The program offers BS, MS, and PhD degrees and is distinguished by its research and strong collaborative connections between academic science/engineering, clinical medicine, and industry.

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Through its recent acquisition of nanomechanical testing leader Hysitron, Bruker now proudly offers the Hysitron® BioSensors™ In-Situ Interface, a mechanical test instrument specifically designed for multiscale quantitative mechanical testing of biological materials and soft matter such as hydrogels. The Biosensors™ In-Situ Interface, with existing inverted optical microscopes, synchronizing powerful mechanical and optical testing techniques to achieve a comprehensive understanding of the mechanics of biomaterials.

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Email: newyork@cambridge.org
Web: www.cambridge.org

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Booth #524

Carnegie Mellon University
5000 Forbes Avenue
Pittsburgh, PA 15213
Phone: 412-686-2222
Email: bme-purchasing@andrew.cmu.edu
Web: www.bme.cmu.edu

The Department of Biomedical Engineering at Carnegie Mellon is built upon a long tradition of interdisciplinary research across departmental borders. Its decades-old research program emphasizes a collaborative network that balances four synergistic areas: basic engineering principles of living cells and tissues, engineering tools for biomedical research, interface between living and artificial materials, and clinical applications of biomedical engineering. Training programs encourage students to expand their vision and prepare them for a wide range of careers from academic research in basic sciences, to engineering entrepreneurship, to medical care.

Booth #401

Case Western Reserve University
10900 Euclid Avenue
Cleveland, OH 44106
Phone: 216-368-4094
Email: cmedept@case.edu
Web: http://bme.case.edu/

The Department of Biomedical Engineering at Case Western Reserve University offers distinctive programs ranging from the B.S. degree through the Ph.D. degree, including our innovative M.D./Ph.D. degree, M.D./M.S. degree, and our Biomedical Entrepreneurship program. CWRU’s research thrusts include: biomaterials and tissue engineering, neural engineering and neuroprotheses, biomechanical imaging and sensing, transport and metabolic engineering, biomechanics, and targeted therapeutics.

Booth #301

Case Western Reserve University
CWRU Center for Multimodal Evaluation of Engineered Cartilage
10900 Euclid Avenue
Cleveland, OH 44106
Phone: 216-368-1333
Email: ccmeccase.edu
Web: http://ccmeccase.edu/

The Center provides a nexus of capabilities where academic and industrial researchers from local, national, and international labs can access information, obtain assistance and training with planning and methods, and utilize specialized facilities to evaluate their engineered tissues. The Center provides “one-stop shopping” of technologies for comprehensive, multimodal evaluation of engineered tissue with emphasis on the following areas:
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Booth #708
Clemson University
Department of Bioengineering
301 Rhodes Hall
Clemson, SC 29670
Phone: 864-656-7276
Email: marian@clemson.edu
Web: www.clemson.edu/ces/bioe

With research labs, classrooms and innovation space for business partnerships at Clemson, Greenville, and Medical University of South Carolina, Clemson BIOE abounds with opportunities for personalized education, transformative research, networking with life sciences companies and investors and bold entrepreneurship that turns innovation into goods that are now improving health care in the US and abroad.

Booths #809/811
Columbia University
Department of Biomedical Engineering
301 Engineering Terrace
500 West 120th Street
New York, NY 10027
Phone: 212-854-4460
Email: bme@columbia.edu
Web: www.bme.columbia.edu

The Department of Biomedical Engineering at Columbia University offers biomedical engineering education and research through B.S., M.S., Ph.D., and M.D./Ph.D. degree programs. Our department provides a surprising mix of the intellectual atmosphere of an Ivy League institution and the sense of community of a small college enriched by the diversity of New York City.

Booths #500/502
Cornell University
103 Weill Hall
Ithaca, NY 14853
Phone: 607-255-2573
Email: bh42@cornell.edu
Web: www.bme.cornell.edu

The Meinig School of Biomedical Engineering at Cornell University focuses on interdisciplinary research to achieve a quantitative understanding of human biology at all spatial and temporal scales with the goal of improving human health. The school has a close relationship with the Weill Cornell Medicine medical school and its associated hospitals in New York City, including an “Immersion Term”, during which all BME Ph.D. students spend 7 weeks in a clinical experience at Weill Cornell Medicine. Cornell University is a comprehensive university with outstanding programs of teaching and research in all areas of human inquiry, which has its main campus at Ithaca in the beautiful Finger Lakes Region of upstate New York. The Meinig School has close collaborations with other departments on campus. For more information, please visit http://www.bme.cornell.edu/.

Booth #917
Engineering in Medicine at Dartmouth
14 Engineering Drive
Hanover, NH 03755
Phone: 603-650-1913
Email: sally.m.hull@dartmouth.edu
Web: engineering.dartmouth.edu

Engineering in Medicine research programs at Dartmouth will be exhibiting info on biomedical engineering internships and PhD programs, existing between unique programs in both engineering and medical schools. Located in Hanover, New Hampshire, Dartmouth’s unique brand of biomedical engineering is within the engineering science education program, to foster cross-disciplinary innovation.
**Booth '121**
Drexel University  
School of Biomedical Engineering, Science & Health Systems  
3141 Chestnut Street, Bozzano 718  
Philadelphia, PA 19104  
Phone: 215-258-2307  
Email: twz22@drexel.edu  
Web: biomed.drexel.edu  
The School of Biomedical Engineering, Science and Health Systems is a nationally recognized center of research and education. Areas of specialization include biomechanics, human performance, biomaterials, tissue engineering, biomedical imaging, bioinformatics and drug delivery. Multidisciplinary research is carried out through collaborations with clinical institutions in the Philadelphia area.

**Booth '215**
Duke University  
Department of Biomedical Engineering  
101 Science Drive  
1427 Fitzpatrick (CIEMAS) Building  
Durham, NC 27708  
Phone: 919-660-5131  
Email: Kristen.rivers@duke.edu  
Web: http://bme.duke.edu  
The mission of the Department of Biomedical Engineering has its foundation in that of Duke University. We work closely with researchers, of various disciplines, to identify important problems that impact human health and solve them using our technical expertise. We engage motivated and talented students in the classroom, laboratory and clinic, imparting to them the spirit of our mission as we prepare them for future careers as effective, knowledgeable, and ethical leaders in corporate, professional, and academic communities.

**Booth '303**
Duquesne University  
Biomedical Engineering  
600 Forbes Avenue  
307 Libermann Hall  
Pittsburgh, PA 15282  
Phone: 412-396-2662  
Email: babinsack@duq.edu  
Web: www.duq.edu/bme  
The Biomedical Engineering Program and Duquesne University is offering a graduate program, beginning in the fall of 2018. The program offers a thesis or non-thesis degree in biomedical engineering. The curriculum is 32 credits and covers coursework in various fields of biomedical engineering. Research facilities are available for thesis work covering biomedical optics, biomaterials, medical imaging and other areas.

**Booth '704**
Edwards Lifesciences  
One Edwards Way  
Irvine, CA 92614  
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Medical research labs have been using the 3D-Bioplotter to print hydrogel constructs to promote organ and tissue regeneration.

**EnvisionTEC**

**Booth #304**

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**Booth #1022**

**Florida International University**

10555 West Flagler Street

Miami, FL 33174

Phone: 305-348-7292

Email: smanjar@fiu.edu

Web: www.bme.fiu.edu

Located in the Washington DC metropolitan area, George Mason University’s Department of Bioengineering offers unique research and educational experience with collaborative opportunities with nearby national laboratories, institutes, and clinical facilities. The BS program offers three concentrations: Biomedical Signals & Systems, Bioengineering Healthcare Informatics, and Bioengineering Prehealth; it has grown very rapidly since its inception in 2010 to over 220 undergraduate students and earned accreditation from ABET in 2012. The Bioengineering PhD program started in Spring 2015, has already over 20 graduate students, and is currently accepting new applications from outstanding prospective students with full tuition and stipend support. The department has 16 primary faculty members with approximately $20M of active research in multidisciplinary areas of bioengineering ranging from biomaterials, biomechanics, biomedical imaging, nanomedicine, and neural engineering.
**Booth #203**
The George Washington University  
800 22nd Street NW, Suite 2885  
Washington, DC 20052  
Phone: 202-994-1802  
Email: engineering@gwu.edu  
Web: www.graduatedseas.gwu.edu  
The George Washington University’s School of Engineering and Applied Sciences grants graduate degrees and certificates in 11 fields of study within engineering and computer science, including biomedical engineering and regulatory biomedical engineering. All courses are held on the main campus in downtown Washington, D.C.

**Booths #614/616**  
Georgia Tech/Emory University  
Wallace H. Coulter Department of Biomedical Engineering  
313 First Drive  
Atlanta, GA 30332  
Phone: 404-385-0124  
Email: gtech@bme.gatech.edu  
Web: www.bme.gatech.edu  
The PhD Program has an emphasis on applications to human health. Research areas include: Biomechanics & Mechanobiology; Biomedical Imaging & Optics; Cellular, Molecular & Biomaterials Engineering; Computational Biomedical Systems Analysis; and Healthcare Informatics & Technology. The BioID Master’s Program in Biomedical Innovation & Development focuses on needs-finding, engineering development, regulatory requirements, and commercialization of medical devices. It is a one-of-a-kind academic and clinical experience.

**Booth #314**  
Illinois Tech--BME  
3200 S. Dearborn Street  
Chicago, IL 60616  
Phone: 312-567-5790  
Email: georgia@iit.edu  
Web: www.iit.edu  
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**Booths #905**  
Imperial College London  
Department of Bioengineering  
South Kensington Campus  
London SW7 2AZ UK  
Phone: +44 (0)20 7949 5179  
Email: bioengineering@imperial.ac.uk  
Web: imperial.ac.uk/bioengineering  
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Baltimore, MD 21205  
Phone: 410-614-4280  
Email: hnr@jhmi.edu  
Web: www.bme.jhu.edu  
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**Booths #220/222**  
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5 Hwarangno 14-gil, Seongbuk-gu  
Seoul 02792  
Republic of Korea  
Phone: +82-2-958-6142  
Email: alberto@kist.re.kr  
Web: www.kist.re.kr  
The Biomedical Research Institute at KIST is Korea’s leading medical research agency. Making important discoveries that improve health andsave lives, we invite you to learn more about our institute and research accomplishments. We also will be providing opportu- 

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**Booth #721**  
Lehigh University Bioengineering  
111 Research Drive, Room D325  
Bethlehem, PA 18015  
Phone: 610-758-4091  
Email: mcode@lehigh.edu  
Web: www.lehigh.edu/bioengineering  
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**Booth #310**  
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Biomedical Engineering  
P.O. Box 10157  
818 Nelson Avenue  
Ruston, LA 71272  
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Email: ahill@latech.edu  
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Marquette University  
Medical College of Wisconsin  
8701 Watertown Road  
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Phone: 414-955-8671  
Email: bme@mcw.marquette.edu  
Web: www.mcw.marquette.edu/  
As a biomedical engineering student at Lawrence Tech, you will be exposed to the University’s signature “Theory and Practice” approach to learning. Extensive laboratory work and opportunities for co-ops and internships in hospitals, health care institutions, and the medical equipment industry provide valuable hands-on experiences, and dedicated faculty bring current industry knowledge and cutting-edge research to the classroom. In addition to the ABET-accredited BS program, the university now offers a graduate degree. All student must complete 30 credit hours, which include either a design project or a research thesis. The program focuses on a range of topics, including biomedical engineering, bioinformatics, regulatory requirements, and commercialization of medical devices.

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Booth #514/516
Mayo Clinic Graduate School of Biomedical Sciences
Biomedical Engineering & Physiology
200 First Street, SW
SMH JO 4-184
Rochester, MN 55905
Phone: 507-255-8544
Email: kingsleyberg.shirley@mayo.edu
Web: www.mayo.edu/gs/programs/phd/biomedical-engineering

The Graduate Program in Biomedical Engineering & Physiology at Mayo Clinic Graduate School of Biomedical Sciences has a long, rich history with a tradition of research that spans interdisciplinary boundaries and routinely connects the engineering and physical sciences to the biological sciences and clinical practice. The Mayo Graduate School offers graduate programs in various fields leading to PhD and MD/PhD degrees. The Graduate Program in Biomedical Engineering & Physiology offers a wide range of research opportunities from basic discovery science to clinical and translational research. Students are provided the necessary quantitative tools to become leaders in diverse fields of biomedical sciences.

Booth #424
McGill University
Department of Bioengineering
817 Sherbrooke Street West, Room 270
Montreal, Quebec H3A 0C3 Canada
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Booth #402
Michigan State University
Department of Biomedical Engineering
775 Woodlot Drive
4000 Bio Engineering Building
East Lansing, MI 48824
Phone: 517-884-4976
Email: princem@egr.msu.edu
Web: www.egr.msu.edu/bme/

The new Department of Biomedical Engineering at Michigan State University is devoted to basic and applied research at the interface of life sciences and engineering. The department is housed in a brand new 135,000-square-foot building that brings together interdisciplinary investigators to solve the world’s greatest biomedical challenges.

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Department of Biomedical Engineering
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Phone: 517-884-4976
Email: princem@egr.msu.edu
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Midwestern University Institute for Healthcare Innovation (IHI) was established in 2014 to facilitate clinical and translational research with Midwestern University Colleges of Veterinary Medicine, Osteopathic Medicine, Dental Medicine, Pharmacy, Optometry and Health Sciences. The IHI is staffed by personnel with industry, research and clinical experience. The IHI can assist external collaborators and industry sponsors.

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Web: http://www.nibib.nih.gov

National Society of Black Engineers
205 Daingerfield Road
Alexandria, VA  22314
Phone: 703-837-9919
Email: ywatson@nsbe.org
Web: www.nsbe.org

With more than 500 chapters and more than 17,000 active members in the U.S. and abroad, the National Society of Black Engineers (NSBE) is one of the largest student-governed organizations based in the United States. NSBE, founded in 1975, supports and promotes the aspirations of collegiate and pre-collegiate students and technical professionals in engineering and technology. NSBE’s mission is “to increase the number of culturally responsible black engineers who excel academically, succeed professionally and positively impact the community.” www.nsbe.org

National Science Foundation (NSF)
Division of Chemical, Bioengineering, Environmental and Transport Systems (CBET)
2415 Eisenhower Avenue
Alexandria, VA  22314
Phone: 703-292-5111
Email: tsuttle@nsf.gov
Web: www.nsf.gov

The NSF-Division of Chemical, Bioengineering, Environmental, and Transport Systems (CBET) supports innovative research and education primarily in the fields of chemical, mechanical, and civil/environmental engineering, and bioengineering. The CBET program director from the Engineering of Biomedical Systems and Disability and Rehabilitation Engineering programs will be available to answer questions about proposals, areas for funding, timeline and expectations while writing, and common author mistakes. Attendees can also gain tips on how to create and develop a proposal while incorporating key-features requested by NSF.

New Jersey Institute of Technology (NJIT)
Department of Biomedical Engineering
University Heights
Newark, NJ 07102
Phone: 973-596-5476
Email: rocha@njit.edu
Web: http://biomedical.njit.edu

NJIT’s Biomedical Engineering Department (BME) is among the top producers of BME degrees in the region with over 300 undergraduate, 100 master’s and 50 doctoral students. Our Ph.D. program is delivered jointly with the Graduate School of Biomedical Science at Rutgers New Jersey Medical School. In 2010, the National Research Council ranked our Ph.D. program 26 out of 76 nationally for curriculum quality and student accomplishments. Our popular master’s degree program can be customized providing you the opportunity to meet your academic and professional goals. Our undergraduate program is ABET accredited and attracts a diverse student body with the highest GPA and SAT scores at NJIT. We are a research-active department in areas of head injury biomechanics, neuro-rehabilitation, direct brain interfacing, biomedical imaging, neural signal processing, cellular/molecular tissue engineering and biomaterials.

Northern Arizona University
Doctoral Degree in Bioengineering
617 S. Beaver Street
Building 21, Box 4185
Flagstaff, AZ  86011
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PennState
College of Engineering
www.bme.psu.edu

Booth #202

The Pennsylvania State University

205 Hallowell Building
University Park, PA 16802
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Email: glm108@psu.edu
Web: www.bme.psu.edu

The Penn State Department of Biomedical Engineering and the Intercollege Graduate Degree Program in Bioengineering are proud to offer B.S., M.S. and Ph.D. degrees. Our mission is to educate students to become world-class engineers who contribute to biomedical engineering development through innovative solutions to problems in biotechnologies, medicine and the life sciences. The graduate program offers strong integration with many other disciplines to increase the breadth of our uniquely trained faculty and specialized facilities. Cutting-edge research in fundamental bioengineering, biomaterials, physical, medical and life sciences with a goal to translate discovery from academia to society. We look forward to meeting you!

Booth #217

Phoenix Analysis and Design Technologies

St. John's Research Drive
Suite 110
Tempe, AZ 85284
Phone: 480-813-4884
Email: john.williams@padtinc.com
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Phoenix Analysis and Design Technologies is an engineering product and services company that focuses on helping customers who develop physical products by providing Numerical Simulation, Product Development, and 3D Printing solutions. Since its establishment in 1994, companies have relied on PADT because “We Make Innovation Work.”

Booth #509/511

Purdue University

Weldon School of Biomedical Engineering
206 S. Martin Jischke Drive
West Lafayette, IN 47907-2032
Phone: 765-494-2995
Email: WeldonBMEGrad@purdue.edu
Web: www.purdue.edu/bme

The Weldon School of Biomedical Engineering at Purdue recruits exceptional MS and PhD students for nationally-funded graduate programs in four signature areas of expertise: imaging, instrumentation, engineered biomaterials and biomechanics, and quantitative cellular and systems engineering. We are continuing to grow our diverse faculty and clinical partnerships that distinguish us in biomedical entrepreneurship, regulatory science, and translational impact.

Booth #715

Rensselaer Polytechnic Institute

518 Grove St.
BMED JEC7049
Troy, NY 12180
Phone: 518-276-6458
Email: bme@rpi.edu
Web: www.bme.rpi.edu

Rensselaer Polytechnic Institute is the nation’s oldest technological research university educating outstanding academics, industry leaders and research scientists. Stop by and learn about graduate programs (MS and PhD) as well as opportunities for graduate students (NIH Pre-doctoral Training Program, NSF iCOREPS site) and Under-graduates (REU in Bioengineering and Biomanufacturing) (bme.rpi.edu).

Booths #300/302

Rice University Department of Bioengineering

6100 Main Street
Houston, TX 77005-1892
Phone: 713-348-5869
Email: bioengineering@rice.edu
Web: www.bioengineering.rice.edu

Rice University’s Department of Bioengineering is a top-tier teaching and research institution with graduate programs that lead to an MBE, PhD, or a joint MD/PhD with Baylor College of Medicine. Situated next to the Texas Medical Center, we offer education and research opportunities in biomaterials and drug delivery, biomedical imaging and diagnostics, cellular and biomolecular engineering, computational and theoretical bioengineering, systems and synthetic biology, and tissue engineering and biomechanics.

Booths #820/822/824

Rutgers, The State University of New Jersey

595 Taylor Road
Piscataway, NJ 08854
Phone: 848-445-4500
Email: shreiber@soe.rutgers.edu
Web: http://bme.rutgers.edu

The Rutgers Department of Biomedical Engineering (BME) is a vibrant and dynamic enterprise of scholarship, learning, and technology development. Located in the heart of New Jersey’s “Cure Corridor,” BME offers a remarkably diverse array of opportunities for undergraduate, graduate, and postgraduate training and research in molecular systems bioengineering, biomaterials and tissue engineering, biomano-technology, biomechanics, rehabilitation engineering, and biomedical imaging. The program offers a BS degree at the undergraduate level, and PhD, MS, and MEng degrees at the graduate level, the last of which is also offered 100% online. The program also offers joint Masters of Business and Science (MBS) and MD-PhD degrees, as well as a certificate in Medical Device Design and Development.

Booth #115

S-E-A, Ltd.

7001 Buffalo Parkway
Columbus, OH 43229
Phone: 800-872-6851
Email: evaldev@sealimited.com
Web: www.sealimited.com

S-E-A is a multi-disciplined forensic, testing and evaluation team of licensed/registered professionals who are experts in their specialty. With services in biomechanical, materials, microscopy and medical visualization/illustration, S-E-A offers our clients laboratory services for pre-market/in-vitro evaluations along with the confidence of knowing S-E-A’s advanced analytical and testing tools are employed.
Sony Healthcare Solutions
1 Sony Drive, mK2E
Park Ridge, NJ  07656
Phone: 201-910-1000
Email: Brian.Zimmer@sony.com
Web: www.sony.com/medical
Sony medical grade 4K 3D displays, recorders and content management system

Stevens Institute of Technology
1 Castle Point on Hudson
Hoboken, NJ  07030
Phone: 201-216-5000
Email: mgray@stevens.edu
Web: www.stevens.edu

Booth ‘200

Stony Brook University
Biomedical Engineering Department
101 Bioengineering Building
Stony Brook, NY  11794-5281
Phone: 631-632-1480
Email: david.rubenstein@stonybrook.edu
Web: www.bme.stonybrook.edu

The mission of the BME department at Stony Brook University is to fully integrate the cutting edge of engineering and physical sciences with state-of-the-art biology to advance our understanding of biomedical problems, and to drive the development of therapeutics, diagnostics and medical devices. Areas of research expertise include biomechanics, bioelectricity, tissue engineering, bioinstrumentation, cellular and molecular bioengineering, and bioimaging.

Booth ‘417

Temple University
College of Engineering,
Department of Biomechanical Engineering
1947 North 12th Street
Philadelphia, PA 19122
Phone: 215-284-4304
Email: doreen.aiello@temple.edu
Web: http://engineering.temple.edu/bioengineering

In the Department of Biomechanical Engineering at Temple University, our faculty aim to help our undergraduate and graduate students sculpt their ideas, we teach and train them to understand health-related problems, to develop possible solutions through fundamental, knowledge-based paths, and to implement those solutions through translational methods. Our students are equally versed in quantitative, engineering approaches to cellular based natural sciences (biology, physiology, chemistry) and in devices-based skills (programming, data science, instrumentation). Through education and research, we will prepare new generations of versatile, problem oriented, multiscale, entrepreneurial engineers, who can easily step out of their expertise to integrate skill sets with information from other fields.

Booth ‘725

Tufts University
Biomedical Engineering
4 Colby Street
Medford, MA  02155
Phone: 617-627-2580
Email: bme@tufts.edu
Web: www.engineering.tufts.edu/bme

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 engineer- ing achieved through a systems approach - integrating cells, scaffolds and bioreactors to control the environment in vivo for translation in vivo.
<table>
<thead>
<tr>
<th>Booth #184/186</th>
<th>University of California, Irvine 3120 Natural Sciences II Irvine, CA 92697-2715 Phone: 949-824-3494 Fax: 949-824-3494 Email: <a href="mailto:bme@uci.edu">bme@uci.edu</a> Web: <a href="http://www.eng.uci.edu/dept/bme">www.eng.uci.edu/dept/bme</a> The goal of the UCI biomedical engineering program is to train students for industry jobs in the biomedical and biotechnology industries, healthcare professions and academia. Located at a world-class research university deep in the heart of the nation’s biomedical device and technology capital, we are uniquely positioned to build upon our existing research strengths.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Booth #908</td>
<td>UC San Diego 9500 Gilman Drive San Diego, CA 92093 Phone: 858-222-3441 Email: <a href="mailto:gmoore@sandiego.edu">gmoore@sandiego.edu</a> Web: <a href="http://bme.ucsd.edu/">http://bme.ucsd.edu/</a></td>
</tr>
<tr>
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<tr>
<td>Booth #125</td>
<td>University of California, Riverside Department of Bioengineering 900 University Pathway 205 Materials Science and Engineering Riverside, CA 92521 Phone: 951-827-4103 Email: <a href="mailto:big@engr.ucr.edu">big@engr.ucr.edu</a> Web: <a href="http://www.bioeng.ucr.edu">www.bioeng.ucr.edu</a> The mission of the Department of Bioengineering at the University of California, Riverside focuses on two interrelated themes: 1. Advancing bioengineering research and, 2. Preparing future leadership in bioengineering and related fields. Our unique interdisciplinary graduate program and ABET-accredited undergraduate program both combine building a solid fundamental foundation in biological sciences and engineering while, simultaneously, developing diverse communication skills for our students. Bioengineering Interdepartmental Graduate Program (BIG) provides additional training in analytical, computational and laboratory skills in the most advanced quantitative bioengineering research. The result is a rigorous, but exceptionally interactive and welcoming educational training for Bioengineering students leading towards B.S., M.S. and Ph.D. degrees.</td>
</tr>
<tr>
<td></td>
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<tr>
<td>Booth #420</td>
<td>University of Chicago Institute for Molecular Engineering 5640 South Ellis Avenue, ERC 299 Chicago, IL 60637 Phone: 773-832-2290 Email: <a href="mailto:iome@uchicago.edu">iome@uchicago.edu</a> Web: <a href="http://iome.uchicago.edu">http://iome.uchicago.edu</a> The IME PhD program equips students with engineering principles to analyze and design molecules for emerging applications, taking research beyond the boundaries of traditional engineering fields. Students work closely with faculty and peers in combining problem-solving skills with broad scientific expertise to build useful systems from the molecular level up.</td>
</tr>
<tr>
<td>Booth #105</td>
<td>University of Cincinnati PO. Box 210012 Cincinnati, OH 45221 Phone: 513-556-0988 Email: <a href="mailto:michelle.montoya@uc.edu">michelle.montoya@uc.edu</a> Web: <a href="http://www.uc.edu">www.uc.edu</a></td>
</tr>
<tr>
<td>Booth #415</td>
<td>University of Colorado Denver Department of Bioengineering 12705 E. Montview Avenue Suite 100 Aurora, CO 80045 Phone: 303-724-5893 Email: <a href="mailto:bioengineering@ucdenver.edu">bioengineering@ucdenver.edu</a> Web: <a href="http://www.ucdenver.edu/bioengineering">www.ucdenver.edu/bioengineering</a> The Bioengineering program at CU Denver welcomes undergraduate, master and PhD students. Our students learn and perform research or medical device design in world-class hospitals and clinical research labs. Our research focus areas: tissue engineering, neuroscience, assistive technology, biomedical device design, entrepreneurship, regulatory affairs and clinical imaging.</td>
</tr>
<tr>
<td>Booth #709</td>
<td>University of Florida 1275 Center Drive Biomedical Sciences Building JS-56 Gainesville, FL 32611 Phone: 352-273-9222 Email: <a href="mailto:info@bme.ufl.edu">info@bme.ufl.edu</a> Web: <a href="http://www.bme.ufl.edu">www.bme.ufl.edu</a> The J. Crayton Pruitt Family Department of Biomedical Engineering at the University of Florida (UF BME) is dedicated to developing innovative and clinically translatable biomedical technologies, educating future generations of biomedical engineers, and cultivating leaders, by nurturing integration of engineering, science, and healthcare in a collaborative and dynamic educational and research environment. UF BME is one of only a few departments nationally to be co-located with a top-ranked medical school, veterinary school, and dental school, along with having a strong culture of entrepreneurship and commercialization.</td>
</tr>
<tr>
<td>Booth #1002</td>
<td>University of Georgia School of Chemical, Materials and Biomedical Engineering Driftmier Engineering Center 597 D.W. Brooks Drive Athens, GA 30602 Phone: 706-542-0870 Email: <a href="mailto:james.warnock@uga.edu">james.warnock@uga.edu</a> Web: <a href="http://engineering.uga.edu/schools/cmb">http://engineering.uga.edu/schools/cmb</a> The newly formed School of Chemical, Materials and Biomedical Engineering at the University of Georgia is focused on translational research in the areas of bio-manufacturing, Bio-based materials and Next-gen advanced therapeutics. The school offers several graduate programs, including PhD programs in Biochemical Engineering, Biomedical Engineering and Biological &amp; Agricultural Engineering.</td>
</tr>
<tr>
<td>Booth #21</td>
<td>University of Illinois at Chicago 837 S. Morgan Street Room 218 Chicago, IL 60607 Phone: 312-996-2335 Email: <a href="mailto:bioe@ucic.edu">bioe@ucic.edu</a> Web: <a href="http://www.bioe.uic.edu">www.bioe.uic.edu</a> One of the first degree granting and accredited Bioengineering programs in the nation, since 1965 UIUC Bioengineering offers B.S., M.S., Ph.D., M.D./M.S. and M.D./Ph.D. programs that emphasize translational research and innovative training that can include clinical immersion and industry-linked interdisciplinary medical product development. The Richard and Loan Hill Department of Bioengineering is led by 30 core and more than 100 affiliate faculty who collaborate with researchers in five major academic medical centers in Chicago - including UIC, home of the largest medical school in the country.</td>
</tr>
</tbody>
</table>
A Degree to fit your career aspirations

- Ph.D. • M.S. • M.Eng.

In an area that piques your interest

- Bioimaging at Multi-Scale • Bio-Micro/Nanotechnology • General Bioengineering
- Molecular, Cellular, & Tissue Engineering • Computational & Systems Biology
- Bioinstrumentation • Computational Genomics • Synthetic Bioengineering

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- Cancer Center at Illinois

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University of Illinois @ Urbana-Champaign Bioengineering
1304 W. Springfield Avenue
1270 DCL
Urbana, IL 61801
Phone: 217-333-1867
Email: boeng@illinois.edu
Web: http://bioengineering.illinois.edu

With strengths in bioimaging at multi-scale; bio-micro and nanotechnology; computational and systems biology; molecular, cellular and tissue engineering; synthetic bioengineering; and research in BIME education, the Department of Bioengineering at Illinois is addressing grand challenges in human health and sustainability. Come join a top-ranked engineering school and one of the fastest-growing, innovative bioengineering departments. We are committed to providing the best experience for our students and training future bioengineering leaders by incorporating diverse topics of science, engineering, technology and medicine into our teaching. We offer BS, MS, MSeng, and PhD degrees and are driving the development of the new Carle Illinois College of Medicine, one of the nation's first engineering-based medical schools, with its first cohort expected to begin in Fall 2018.

Booth '409
University of Illinois @ Urbana-Champaign Master of Engineering (Professional Master’s Program)
1304 W. Springfield Avenue
1270 Digital Computer Lab, MC 278
Urbana, IL 61801
Phone: 217-333-1867
Email: bioe-meng@illinois.edu
Web: http://bioe.engr.illinois.edu

Illinois’ Master of Engineering in Bioengineering is a one-year, non-thesis degree program designed for industry-bound professionals who seek to advance their technical breadth and depth in fields related to bioengineering, while developing a big-picture business perspective. The program offers a choice from one of three transcriptable concentrations: bioinstrumentation (medical devices), computational genomics (big data genome sequencing) and general bioengineering. At Illinois, you’ll gain hands-on experience, leadership ability, and unparalleled skills needed to be successful in your chosen career.

Booth '308
The University of Kansas
1520 West 15th Street
Lawrence, KS 66045
Phone: 785-864-5258
E-mail: bioe@ku.edu
Web: http://bioe.engr.ku.edu/

KU Bioengineering is an exciting and dynamic place. Our curriculum is broad and flexible, embracing the interdisciplinary nature of the field. With six tracks; Bioimaging, Bioinformatics, Biomolecular, Biomedical Product Design & Development, Biomechanics & Neural, and Biomaterials & Tissue; and a collaboration with the University of Kansas Medical Center, students customize their education and create a niche of research before they enter the job market.

Booth '211
University of Kentucky Department of Biomedical Engineering
522 Robotics and Manufacturing Building
143 Graham Avenue
Lexington, KY 40506
Phone: 859-257-8101
Email: jennifer.hart@uky.edu
Web: www.bme.uky.edu

The University of Kentucky’s Department of Biomedical Engineering is the nation’s first engineering-based medical schools, with the establishment of the new Carle Illinois College of Medicine, one of the nation’s first engineering-based medical schools, with its first cohort expected to begin in Fall 2018.

Booth #531
University of Louisville
2301 South Third Street
Louisville, KY 40208
Phone: 502-852-7485
Email: nahans01@louisville.edu
Web: http://louisville.edu/speed/bioengineering

Booths ‘323/325
Fischell Department of Bioengineering
University of Maryland
8228 Paint Branch Drive
2330 Jeong H. Kim Engineering Building
College Park MD. 20742
Phone: 301-405-8268
Email: bioe@umd.edu
Web: http://bioe.umd.edu

The Fischell Department of Bioengineering at UMD is committed to making a difference in human health care through education, research, and invention. We offer programs leading to the B.S., M. Eng., M.S., M.S./M.D., M.D./Ph.D. and Ph.D. degrees. This year, we welcomed four new faculty, while launching an Institute for Biomedical Devices, and the Center for Engineering Complex Tissues.

Booths ‘223/225
University of Miami Department of Biomedical Engineering
1211 Memorial Drive
MEA 219
Coral Gables, FL 33146
Phone: 305-284-2445
Email: bme.coe@miami.edu
Web: www.miami.edu/bme

Our undergraduate and graduate programs leading to the B.S., 5 year B.S./M.S., M.S and Ph.D. degrees provide graduates with the analytical and design skills required to solve problems at the interface of engineering and life sciences. Special features of our program include small class size, very strong ties with the University of Miami Miller School of Medicine, high level of student-faculty interaction, and a high percentage of undergraduate student participation in research and professional activities. The research areas of our Faculty include imaging, optics and lasers; neural engineering, signals and instrumentation; and biomechanics, biomaterials and tissue engineering.
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For questions, contact Cherie Hudson at cheriehudson@ou.edu or (405) 325-0789.

To learn about the multiple Stephenson Endowed Professorships and Stephenson Graduate Fellowships, contact Michael Detamore, director of the Stephenson School of Biomedical Engineering at detamore@ou.edu.

The University of Oklahoma is an equal opportunity institution in education and employment.
PhD in Biomedical Engineering

Offered by the Department of Bioengineering at The University of Texas at Dallas, the Biomedical Engineering PhD program has over 20 research faculty with more than $20M in active funding from the NIH, NSF, DARPA and industry partners. PhD applicants are eligible to be selected for a Eugene McDermott Graduate Fellowship, which includes a generous stipend, tuition, and a $10,000 annual discretionary budget.

Application Deadline: December 1, 2017

For More Information:
972.883.5155
bmenadvising@utdallas.edu
be.utdallas.edu

Booth ‘305
The University of Texas Arlington
Bioengineering Department
500 UT Arlington
Suite 226
Arlington, TX 76019
Phone: 817-272-2249
Email: cbradfield@uta.edu
Web: www.uta.edu/bioengineering

The Bioengineering Department at The University of Texas Arlington offers several research and scholarship opportunities for students interested in Biomaterials & Regenerative Tissue Engineering, Biostmiration, Biomechanics, and Biomedical Imaging. Graduate students also have the option of earning a joint graduate degree with The University of Texas Southwest Medical Center at Dallas. Those interested in our programs are strongly encouraged to visit Booth 305 at the exhibit to learn more.

Booth ‘621/623
The University of Texas at Austin
Department of Biomedical Engineering
107 W. Dean Keeton, C0800
Austin, TX 78712
Phone: 512-471-3604
Email: stixby@mail.utexas.edu
Web: www.bme.utexas.edu

The University of Texas at Austin’s Biomedical Engineering Department educates the next generation of biomedical engineers by offering B.S., M.S., and Ph.D. degrees. Scholars and students build interdisciplinary knowledge in areas such as bioinformatics, biomechanics, biomedical imaging and instrumentation, cellular and biomolecular engineering, and computational biomedical engineering, among others.

Booth ‘181
University of Texas at Dallas
2850 Rudoff Avenue
Richardson, TX 75080
Phone: 972-883-5155
Email: ben.porter@utdallas.edu
Web: www.be.utdallas.edu

The University of Texas at Dallas presents their Biomedical Engineering Degree programs to future students and the highly competitive Eugene McDermott Graduate Fellowship for outstanding PhD applicants. Information about UT Dallas’ research programs in bioinformatics, biomaterials, biomechanics, biomedical imaging and optics, biosensors, and neural engineering will also be available.

Booth ‘1000
University of Texas at San Antonio
One UTSA Circle AET 1.102
San Antonio, TX 78249
Phone: 210-458-8529
Email: teja.gudala@utsa.edu
Web: www.engineering.utsa.edu/BME/

The Department of Biomedical Engineering at the University of Texas at San Antonio showcases their undergraduate program and Joint Graduate Programs offering MS and PhD degrees in conjunction with UT Health San Antonio. Information about cutting edge research in biomaterials, tissue engineering, biomechanics, nanomaterials, bioimaging and collaborative disciplines will be available.

Booth ‘425
University of Toronto Institute of Biomaterials & Biomedical Engineering
164 College Street
Suite 226
Toronto, Ontario M5S 3G9 Canada
Phone: 416-978-4841
Email: jeffrey.little@utoronto.ca
Web: www.ibbme.utoronto.ca

The Institute of Biomaterials & Biomedical Engineering (IBBME) at the University of Toronto is located in the heart of Canada’s largest health-care research network. We offer four graduate degrees in biomedical and clinical engineering. Our multidisciplinary approach across the disciplines of engineering, medicine and dentistry address global challenges in human health.

Booth ‘703
University of Vermont
33 Colchester Avenue
Burlington, VT 05405
Phone: 802-656-9544
Email: olidinski@uvm.edu
Web: www.uvm.edu

The University of Vermont Biomedical Engineering program offers graduate studies in biomedical engineering and materials science. Our students have access to cutting edge research in biomaterials, tissue engineering, biomechanics, intelligent systems, imaging and instrumentation, cellular and molecular engineering, and computational biomedical engineering. In addition to MS and PhD degrees, our students may participate in interdisciplinary graduate programs.

Booth ‘504
University of Virginia
P.O. Box 800759 UVA
Charlottesville, VA 22908
Phone: 434-243-5101
Email: bme-dept@virginia.edu
Web: http://bme.virginia.edu

Using our perspective as engineers, we make groundbreaking discoveries in fields like systems biology and biomedical data sciences, medical imaging, and cellular and tissue engineering. We are co-located in the medical school, and our department’s remarkable tendency toward collaboration reflects a culture of cooperation that has been essential to UVA going all the way back to Thomas Jefferson.
Booth ’801
University of Washington Department of Bioengineering
3720 15th Avenue NE, N107
Seattle, WA  98195
Phone: 206-685-2000
Email: bioeng@uw.edu
Web: http://depts.washington.edu/bioe/index.html
University of Washington Bioengineering is a world leader in bioengineering, clinical applications, technology transfer, and service. Please visit booth 801 to discover how we are inventing the future of medicine. Our faculty and students are eager to talk to you!

Booth ’723
University of Wisconsin-Madison Biomedical Engineering Department
1550 Engineering Drive
Madison, WI  53706
Phone: 608-263-4460
Email: info@bme.wisc.edu
Web: www.engr.wisc.edu/bme/bme.html
Please visit our booth to learn more about the B.S., M.S., and Ph.D. programs in Biomedical Engineering at the University of Wisconsin Madison. Staff, students, and faculty will be available to answer your questions and provide information on admissions, curriculum, and our world-class facilities and institution-wide research centers and institutes.

Booth ’609/611
Vanderbilt University
5824 Stevenson Center Drive
Nashville, TN  37235
Phone: 615-343-1099
Email: tina.shaw@vanderbilt.edu
Web: www.vanderbilt.edu
VU BME bridges Vanderbilt’s engineering, basic science departments, and a Top 10 School of Medicine, and is located in a vibrant, destination city. Research strengths include biomaterials and drug delivery, bioMEMS and organs-on-a-chip, biophotonics, image-based technologies and modeling, mechanobiology, and nanomedicine. VU BME stimulates high-impact research and provides unique educational opportunities, and in 2018 will be celebrating its 50th anniversary as a department.

Booth ’202/204
Virginia Commonwealth University
401 W. Main Street
Richmond, VA  23284
Phone: 804-828-7958
Email: biomedicaleng@vcu.edu
Web: www.bimedicaleng.vcu.edu
VCU Biomedical Engineering has strong ties with the VCU Schools of Medicine, Dentistry, and Pharmacy and Massey Cancer Center, and offers Bachelor’s, Master’s, and Doctoral degrees. Research specialties include mechanobiology, regenerative medicine, biomechanics, rehabilitation engineering, biomaterials and computational medicine. The department is actively recruiting junior and senior level faculty.

Booth ’605
Virginia Tech-Wake Forest University School of Biomedical Engineering
& Science
VT-WFU 328E: 317 Kelly Hall
325 Stanger Street
Mail Code 0298
Blacksburg, VA  24061
Phone: 540-231-8191
Email: knistte@vt.edu
Web: www.bbe.vt.edu
The Virginia Tech – Wake Forest University, School for Biomedical Engineering and Sciences offers MS, PhD, MDR, and DKM/PhD degrees. We have 76 biomedical engineering faculty with active research programs in tissue engineering, biomedical imaging, biomechanics, nano-medicine, and bio-inspired neuroengineering and translational research, cardiovascular engineering, and other emerging fields.

Booth ’508/510
Washington University in St. Louis
One Brookings Drive
Box 1097
St. Louis, MO 63131
Phone: 314-935-6164
Email: teasadak@wustl.edu
Web: http://bme.wustl.edu/
In partnership with our world-class medical school and as part of a $550M research enterprise in life sciences and biomedical research, the Department of Biomedical Engineering at Washington University is a gateway to interdisciplinary, basic science and translational research training at the BS, MS and PhD levels. More than 90 research mentors support over 120 BME PhD students in studies of regenerative medicine, imaging, cell and molecular systems, cardiovascular, neural, orthopedic, and cancer engineering. With adjacency to the largest public park in the USA, and over 7,000 sq ft of state-of-the-art facilities, the BME Department at Washington University provides the ideal intellectual, physical and collaborative climate to pursue a BS, MS, MENG, MS/MA, PhD or MD/PhD degree.

Booth ’522
Wayne State University
818 W. Hancock
Detroit, MI  48201
Phone: 313-577-1345
Email: nmurthy@wayne.edu
Web: www.bme.wayne.edu
The Biomedical Engineering Department at Wayne State University offers BS(including dual degree options with Mechanical Engineering and Electrical Engineering), Bridge Certificate in Injury Biomechanics, MS, PhD and MD/PhD degrees. It is involved in some of the most advanced research in the field. Our faculty have made significant contributions in automotive safety and the prevention of sports-related and military injuries. Ground-breaking research is also being conducted in the development of tissue-engineered nerves and heart valves as well as imaging techniques for improved diagnosis of brain injury and cancer. Our research has led to improvement in the standards of the automotive industry, better protective equipment for our soldiers and athletes, new techniques to repair damaged tissue and improved diagnostic imaging of trauma and disease.

Booth ’1008
Woodrow Wilson National Fellowship Foundation
5 Vaught Drive
Suite 300
Princeton, NJ  08540
Phone: 609-945-7852
Email: ndba@woodrow.org
Web: www.woodrow.org
The booth will be staffed with graduate representatives and faculty from the department of Biomedical Engineering at Yale. The faculty and graduate representative will aim to describe the program to interested visitors and answer any questions regarding the program requirements and admissions process.

Booths ’322/324
Worcester Polytechnic Institute (WPI)
100 Institute Road
Worcester, MA  01609
Phone: 508-831-5301
Email: grad@wpi.edu
Web: www.grad.wpi.edu
Graduate students in WPI’s Biomedical Engineering (BME) Department collaborate with scientists and engineers across disciplines, seeking breakthroughs in injury and rehabilitative biomechanics, innovations in regenerative medicine and quantitative microscopy, and major steps forward in healthcare. Whether in the classroom or the lab, the focus is on making an impact and solving real-world problems. WPI’s BME graduates have gone on to rewarding careers at major medical and biomedical research centers across academia, government, and the medical device industry.

Booths ’321
Yale University
Malone Engineering Center
55 Prospect Street
New Haven, CT  06511
Phone: 203-432-4262
Email: deanna.lomax@yale.edu
Web: www.seas.yale.edu/departments/biomedical-engineering
The booth will be staffed with graduate representatives and faculty from the department of Biomedical Engineering at Yale. The faculty and graduate representative will aim to describe the program to interested visitors and answer any questions regarding the program requirements and admissions process.
Where innovation is a degree requirement.

The master’s and doctoral programs in biomedical engineering at WPI produce leaders and entrepreneurs highly valued in today’s workplace. Find your place here, among researchers who are uncovering innovative ways to improve lives.

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VISIT US IN BOOTH 723
### Meeting Location

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wednesday, October 11</td>
<td>Meet the Faculty Candidate Forum</td>
<td>Phoenix Convention Center 300 Level</td>
</tr>
<tr>
<td>Thursday, October 12</td>
<td>BMES State of the Society Address &amp; Pritzker Award Lecture</td>
<td>North Balloon BCD</td>
</tr>
</tbody>
</table>

### Registration

Paid registration is required for admission to all meeting functions including scientific sessions, posters, exhibits, breaks and the BMES BASH on Friday evening. 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. Additional social event tickets including the Celebration of Minorities in BME Luncheon, and the Women in BME Luncheon are separate and above BMES meeting registration.

### On-Site Registration Hours

<table>
<thead>
<tr>
<th>Day</th>
<th>Time</th>
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<tbody>
<tr>
<td>Wednesday, October 11</td>
<td>9:30 am–10:15 am</td>
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<td>Thursday, October 12</td>
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<td>Friday, October 13</td>
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<td>Saturday, October 14</td>
<td>9:30 am–3:00 pm</td>
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### Exhibits

<table>
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<tr>
<th>Date</th>
<th>Location</th>
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<tbody>
<tr>
<td>Wednesday, October 11</td>
<td>Phoenix Convention Center</td>
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<tr>
<td>Saturday, October 14</td>
<td>Phoenix Convention Center</td>
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</tbody>
</table>

### Medical Device Company Tours

- **Phoenix Convention Center**: 100 North 3rd Street, Phoenix, Arizona 85004 602.262.6225
- **Sheraton Grand Phoenix Hotel**: 340 North 3rd Street, Phoenix, Arizona 85004 602.262.2500

- **Registration**: Buses will depart from the convention center entrance.

- **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. Although BMES has paid for wi-fi throughout the convention center during the Annual Meeting, there will not be specific dedicated hard-wired internet access in the meeting rooms.

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

- **Poster Presentations**
  
  Posters will be displayed Thursday, Friday and Saturday. Posters are to be displayed all day on assigned day. Authors must be present during specified viewing with authors as listed in the Scientific Program:

  - **Thursday**: 9:30 am–10:15 am and 3:00 pm–3:45 pm
  - **Friday**: 9:30 am–10:15 am and 2:45 pm–3:30 pm
  - **Saturday**: 9:30 am–10:30 am

  All posters will be in the Exhibit Hall 300 Level in the Phoenix Convention Center. Posters are numbered with a card corresponding to the numbers assigned in the program.

### Speaker Ready Room

- **Registration Area**: Exhibit Hall 300 Level of the Phoenix 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 11**: 1:00 pm–5:00 pm
  - **Thursday, October 12**: 7:00 am–5:00 pm
  - **Friday, October 13**: 7:00 am–5:00 pm
  - **Saturday, October 14**: 7:00 am–3:00 pm

### Program Highlights—Don’t Miss These Events!

- **Wednesday, October 11**

  **Meet the Faculty Candidate Forum**
  
  **Time**: 3:30 pm–5:30 pm
  
  **Location**: Exhibit Hall 300 Level

  The ‘Meet the Faculty Candidate’ poster session provides a great opportunity for faculty, recruiters, and Department Chairs to speak directly with recent PhD graduates and post-doctoral researchers who are seeking faculty positions.

  The BMES 2017 Annual Meeting Meet The Faculty Candidate Forum was only open to those who are actively on the market for the 2017–2018 recruiting cycle. Candidates submitted for consideration in August. The accepted candidates’ CVs can be viewed at www.bmes.org.

- **Wednesday, October 11**

  **Welcome Reception**
  
  **Time**: 5:30 pm–7:00 pm

  Light refreshments will be served. All registrants are invited to attend.

  Welcome Reception sponsored by:

  [Image]

- **Wednesday, October 11**

  **LGBT Dessert Social**
  
  **Time**: 8:00 pm–9:00 pm
  
  **Location**: Paradise Valley Room, Sheraton Grand Phoenix Hotel

  LGBT Social sponsored by:

  [Image]

- **Thursday, October 12**

  **BMES State of the Society Address & Pritzker Award Lecture**
  
  **Time**: 10:15 am
  
  **Location**: North Balloon BCD

  Please join us for a dialogue with BMES President Lori Setton and other leaders of the Society.

- **Friday, October 13**

  **BMES Dessert Party Bash at the Arizona Science Center**
  
  **Time**: 8:30 pm–11:00 pm

  Join us for a Dessert Party this year to celebrate the 2017 BMES Annual Meeting. Cap off the evening with some dessert and networking.

  Designed by renowned architect Antoine Predock, the Arizona Science Center is a unique landmark nestled in the picturesque setting of Heritage and Science Park where history and innovation collide.

  The Arizona Science Center has over 300 hands-on, interactive exhibits that span four levels. Explore the human body, experience the forces of nature, be fascinated by physics, discover digital communications and investigate sustainability and renewable resources.

### Program Highlights

- **BMES 2017 Annual Meeting Welcome Reception**
  
  The BMES 2017 Annual Meeting Welcome Reception sponsored by:

  [Image]

- **BMES 2017 Annual Meeting BMES Dessert Social**
  
  The BMES 2017 Annual Meeting BMES Dessert Social sponsored by:

  [Image]

- **BMES 2017 Annual Meeting BMES State of the Society Address & Pritzker Award Lecture**
  
  The BMES 2017 Annual Meeting BMES State of the Society Address & Pritzker Award Lecture sponsored by:

  [Image]

- **BMES 2017 Annual Meeting BMES Dessert Party Bash at the Arizona Science Center**
  
  The BMES 2017 Annual Meeting BMES Dessert Party Bash at the Arizona Science Center sponsored by:

  [Image]
Thursday, October 12

Celebration of Minorities in BME Luncheon®
11:45 am - 1:15 pm West Ballroom A

*additional registration and $35 ticket required

This event is hosted by the BMES Diversity Committee to create a community and network within the Society fostering support and professional development of minorities in BMES at all levels. Everyone is invited to attend, as diversity only increases when all groups play a part. The luncheon complements the Diversity Award lecture and the Women in BME Luncheon on Friday.

Reframing the Engineering Academic Environment to Expand Opportunities for All Students

Antonio Garcia, PhD
Foundation Professor of BioEngineering, Associate Director, Hispanic Research Center Chair, Biological Design Graduate Program
Arizona State University

Engineering is a profession focused on enriching lives through the creation of new technology. In the U.S., there are many entrepreneurs, companies, programs, and educators that are actively promoting engineering’s importance in our society and have made great strides in attracting young people to pursue engineering degrees. However, while the general public and students of all ages are fascinated by new technology and advances in engineering, enthusiasm for engineering as a career, and the value of engineering? Can we create a high context or integrated approach to teaching and learning? Can we establish a flexible learning environment that appreciates multicontextuality and serves all students?

Dr. García is the Associate Director of the Hispanic Research Center, Foundation Professor of Bioengineering, and Director of the Biological Design Graduate Program in the Ira A. Fulton Schools of Engineering at Arizona State University where he has focused on surface and colloid chemistry for diagnostics, drug delivery, and biomolecule identification and purification. He obtained a doctorate in Chemical Engineering (College of Chemistry) from the University of California, Berkeley and a baccalaureate in Chemical Engineering from Rutgers University, New Brunswick.

Dr. García is very active in research and technology transfer as a professor of bioengineering while also working on education and human resource development as an administrator in the College of Humanities. As Associate Director, he has worked for 27 years on education and human resource projects aimed at improving math, science, and engineering education as well as meeting the demand for a skilled and diverse U.S. technological workforce.

His research work with colleagues in engineering and sciences on combining surface chemistry and fractal texturing in order to move water drops using light was featured in Science News (August 2004). Most recently, he has been developing nanoparticle technology, portable optothermal devices for drug delivery, and nanostructures for sensor development and diagnostics for Pre-Surveillance of infectious diseases. Some of his work has been featured on the covers of the journals: Analyt (May 2007), Advanced Materials (November 2008), and Macromolecules Rapid Communications (February 2010). With colleagues from the UNED and UCM (Madrid, Spain) the work on digital magnetofluidics was also featured in ScienceDaily (2006), and the work on “nanowells” with colleagues from North Carolina State University was featured again in ScienceDaily (July 2008). Presently, he is working on several technology transfer projects in the U.S. and Mexico, that are slated to begin clinical investigations in 2017 and 2018.

Friday, October 13

Women in BME Luncheon®
11:30 am – 1:00 pm West Ballroom A

*additional registration and $35 ticket required

Quadrant 2 Living: Moving from the Urgent to the Important

We live in a world where there are pressures, deadlines, a sense of urgency and many roles to play. These forces can be created by ourselves, those around us, unforeseen circumstances and events, and by the institutions in which we sojourn.

Indeed, while our lunch time is brief instead of lingering, we will explore 2 concepts/tools, that if implemented, will enhance our ability to live the life we envision everyday.

Christopher J. Loving has over 25 years of experience developing and teaching new models of leadership. He has worked with hundreds of organizations (educational, Fortune 500, nonprofit) in the United States and in Europe and is frequently invited to partner with a wide range of audiences through training programs, keynote addresses and coaching relationships. Past and current partnerships include the University of Michigan, University of Washington, Northwestern University, Washington University in St. Louis, The Ohio State University, Case Western Reserve University, Brandeis University, Deloitte Touche Tohmatsu, Aker-Husker-Busch Companies, Inc., Associated Press, National Conference for Community and Justice, and many others.

In the educational sector over the last 20 years, Chris has coached and advised leaders throughout the academy including trustees, presidents, provosts, students, faculty, deans, department chairs, directors, and administrators. In addition, he has developed and facilitated a series of leadership conversations that have improved the climate and effectiveness of academic organizations and designed and presented brief and long-term programs that feature a courageous and compassionate leadership curriculum for department chairs, faculty, postdoctoral associates and graduate students. Chris has also created and presented diversity programs for over 20 years, advised diversity organizations and trained trainers and faculty on how to more effectively develop and teach diversity-training and additional programs in a variety of settings.

Women in BME Luncheon is Sponsored by:
## Additional Meetings

Most of these meetings/events are invitation only. Please check with the organizer.

### Wednesday, October 11

**BMES Board of Directors Meeting**
8:30 am—4:30 pm  Room 126C  
Organizer: Lori Setton

**AIMBE Board of Directors Meeting**
Affiliate Event
1:00 pm—4:00 pm  Room 127C  
Organizer: Milan Yager

**AIMBE Academic Council**
Affiliate Event
4:00 pm—5:00 pm  Room 127C  
Organizer: Milan Yager

**Council of Chairs Dinner & Meeting**
Invitation Only
6:30 pm—9:00 pm  Deer Valley Room  
Organizer: Robert Kirsch

**Industry Committee Planning Meeting**
Invitation Only
7:30 pm—8:30 pm  Laveen A Room  
Organizer: Ben Noe

### Thursday, October 12

**Council of Industry Chapter Presidents—Invitation Only**
7:00 am—8:00 am  Room 126A  
Organizer: Ben Noe

**Diversity Committee Meeting**
7:00 am—8:00 am  Room 127B  
Organizer: Debra Augustine and Guillermo Ameer

**National Meetings Committee Meeting**
8:00 am—9:30 am  Room 126BC  
Organizers: Cynthia Reinhart-King and Shelly Sakiyama-Ellert

**Student Affairs Committee**
8:30 am—9:30 am  Room 127C  
Organizer: Art Ritter

**BMES Board of Directors Meeting**
8:30 am—9:30 am  Room 126C  
Organizer: Lori Setton

**Council of Industry Chapter Presidents—Invitation Only**
7:00 am—8:00 am  Room 126A  
Organizer: Ben Noe

**Diversity Committee Meeting**
7:00 am—8:00 am  Room 127B  
Organizer: Debra Augustine and Guillermo Ameer

**National Meetings Committee Meeting**
8:00 am—9:30 am  Room 126BC  
Organizers: Cynthia Reinhart-King and Shelly Sakiyama-Ellert

**Student Affairs Committee**
8:30 am—9:30 am  Room 127C  
Organizer: Art Ritter

### Thursday, October 12

**Ethics Subcommittee Meeting**
9:30 am—10:30 am  Room 127A  
Organizer: Subrata Saha

**50th Anniversary Committee Meeting**
1:15 pm—3:00 pm  Room 127A  
Organizer: Martine LaBerge

**Industry Advisory Board**
Invitation Only
7:00 am—8:00 am  Room 126A  
Organizer: Ben Noe

**Education Committee Meeting**
7:00 am—8:00 am  Room 127B  
Organizer: Donald Gaver

**2018 Annual Meeting Planning Committee Meeting**
8:00 am—10:00 am  Room 126BC  
Organizer: John Tunnell and John Fisher

**International Committee**
8:00 am—9:00 am  Room 127C  
Organizer: Damir Khismatullin

**Membership Committee Meeting**
3:00 pm—4:00 pm  Room 127C  
Organizer: Kristen Billiar

**Design Competition Judges Meeting**
3:30 pm—4:30 pm  Room 126A  
Organizer: Liz DaSilva

### Friday, October 13

**Industry Advisory Board**
Invitation Only
7:00 am—8:00 am  Room 126A  
Organizer: Ben Noe

**Education Committee Meeting**
7:00 am—8:00 am  Room 127B  
Organizer: Donald Gaver

**2018 Annual Meeting Planning Committee Meeting**
8:00 am—10:00 am  Room 126BC  
Organizer: John Tunnell and John Fisher

**International Committee**
8:00 am—9:00 am  Room 127C  
Organizer: Damir Khismatullin

**Membership Committee Meeting**
3:00 pm—4:00 pm  Room 127C  
Organizer: Kristen Billiar

**Design Competition Judges Meeting**
3:30 pm—4:30 pm  Room 126A  
Organizer: Liz DaSilva

### Saturday, October 14

**BMES Board of Directors Meeting**
12:30 pm—3:30 pm  Room 126BC  
Organizer: Lori Setton

## Receptions located at the Sheraton Grande Phoenix Hotel

- **Thursday, October 12**
  - Clemson Bioengineering
  - Cornell University
  - Georgia Tech / Emory
  - Johns Hopkins University
  - Johns Hopkins University Biomedical Engineering
  - Lehman University
  - Mayo Clinic Graduate School of Biomedical Sciences
  - Rensselaer Polytechnic Institute
  - Rice University
  - The Ohio State University
  - University of California Irvine
  - University of California San Diego
  - University of Florida
  - University of Maryland
  - University of Pennsylvania
  - University of South Carolina
  - Washington University in St. Louis

- **Friday, October 13**
  - Boston University
  - Duke University
  - Florida International University
  - George Washington University
  - Pennsylvania State University
  - UC Berkeley
  - Vanderbilt University
  - Washington University in St. Louis

- **Saturday, October 14**
  - University of Pennsylvania
  - University of Utah
  - University of Virginia
  - University of Washington
  - University of Wisconsin-Madison
  - Washington University in St. Louis
  - University of Southern California
  - Washington University in St. Louis
Perfecting the First-time Student and Early Career Attendee Experience
Welcome to your first BMES Annual Meeting! You are about to embark on a wonderful experience. Attend this special session designed for the First Time Student and Early Career Attendee, and hear how to take advantage of all that is offered. This session will provide you with information and insight to easily navigate the annual meeting in order for you to make the most out of your time in Phoenix.

Thursday, October 12
9:00 am—10:00 am Room 129AB Networking: A Required Life Skill in a Diverse 21st Century
To succeed in today’s competitive world, you know you can become as critical as you know. Successfully networking—developing and utilizing contacts—is an essential skill. Networking involves: 1) making contacts, 2) establishing cordial relationships, and 3) foraging mutual bonds to share information, knowledge, and expertise. This session explores skills and techniques germane to successful networking.

1:00 pm—4:30 pm Room 129AB Coop/Intern and Industrial Relations Workshop—Part II (by invitation)
The industrial relations workshop is for BMES faculty, administrators, and staff to collaboratively discuss challenges and share best practices for engaging industry and promoting students for hire (coop/intern and full-time positions). The workshop includes an industry panel, an update on BMES industry activities, and group discussion time. Participants will work in groups based on geographical regions to foster regional collaboration and program engagement.

Friday, October 13
8:30 am—9:30 am Room 128AB BMES Student Chapter Session—Outstanding Chapter Best Practices
Outstanding Student Chapter awardee University of California, San Diego will provide their chapter best-practices along with the Commendable Achievement awardee Arizona State University. During this workshop each chapter will have the opportunity to present their chapter’s goals and accomplishments. This will allow new and current student chapters an opportunity to ask questions, exchange ideas and implement new goals for their upcoming year.

9:30 am—10:45 am Room 128AB BMES Student Chapter Session—Mentoring, Outreach and Chapter-Industry Best Practices
Outstanding Mentoring awardee Clemson University will provide their chapter best-practices along with the Outreach Program awardee University of Pennsylvania; each will discuss their goals and the success of their programs. Following their presentations Chapter-Industry awardee University of Maryland will present their chapter-industry best practices. During this workshop, students will have the opportunity to ask questions, exchange ideas and implement new goals for their upcoming year.

1:15 pm—2:15 pm Room 124AB Graduate School Part II: Surviving, Thriving, and Succeeding
Succeeding as a graduate student is all about achieving one’s purpose—personal dreams and aspirations for pursuing an advanced degree. An individual’s graduate school venture can take many different turns, but nearly all of them present unique opportunities for growing and developing in areas of knowledge acquisition, personal development, performance management, professionalism, and leadership. This session explores the language, philosophy, and critical strategies applicable to setting the bar high to survive, thrive, achieve, excel, and succeed as a graduate student.

1:45 pm—3:15 pm Room 128AB BMES Undergraduate Student Design Competition
During this session we will bring together the top 6 winning design teams that were selected. The top 6 include Florida Institute of Technology, Johns Hopkins University, Purdue University, Stevens Institute of Technology, University of Maryland and Virginia Commonwealth University. This competition allows each design team to orally present their projects and students to ask questions after each presentation.

Upon completion of all presentations, the judges will select and announce the top 3 winners. Winners will receive first, second and third place prize money during the awards ceremony on Saturday, October 14th at the plenary session.

2:45 pm—4:00 pm Room 124AB BMES Careers in Industry II
Explore the various industry options for BMES professionals. Representatives from industry share their career paths, educational training, insight into the hiring market, and suggestions for current students and recent graduates.

Student Chapter Tables
Alpha Eta Mu Beta, The National Biomedical Engineering Honor Society
San José State University
University of California, San Diego
University of Maryland
University of Oklahoma
University of Southern California
Alpha Eta Mu Beta, Mentoring for Innovative Design Solutions (MINDS) Workshop
Session Co-chairs: Teresa A. Murray, PhD, Alicia Fernandez-Fernandez, PhD, DPT, Marcia A. Pool, PhD, Bahar Dhowan, MS, and Karri A. Green, PhD
1:00 pm—3:00 pm
Room 123
INnovative Design Solutions (MINDS)
1:00 pm—3:00 pm
Room 123
Session Co-chairs: Bahar Dhowan, PhD, Teresa Murray, PhD, and Karri A. Green, PhD.
Participation in this workshop is by invitation only after successfully competing for a spot on a design team to address this year’s design/research topic (please see http://www.alphae- tamaubeta.org for application instructions). Students will work in teams of 4 based on similar interests. Each team will have a mentor who will assist the team in creating a potentially marketable innovation. The mentor will help students incorporate key design considerations, including (i) market considerations for commercialization, (ii) design development and testing, (iii) quality control, (iv) regulatory strategy, and (v) intellectual property protection. After the workshop, students will meet virtually (e.g., via Skype) for up to 8 months to further refine their innovation. They will also be required to produce a more extensive presentation of their product, such as a video for a Kickstarter campaign, or a PowerPoint presentation for a group of potential investors. We will alert participants about opportunities for design contests, investment, and grant programs to further promote and develop their innovations. This program requires an 8 month commitment.

Alpha Eta Mu Beta Annual Grand Meeting
Session Co-chairs: Teresa A. Murray, PhD, Bahar Dhowan, Sana Mohamed, Lauren Pruett, Shyanthony Syrigal, Alicia Fernandez-Fernandez, PhD, DPT, Karri A. Green, MS and Marcia A. Pool, PhD, Dominic E. Nathan PhD
At this annual grand meeting, members representing chapters nationwide will come together to discuss important contemporary events relating to AEMB. (Attendance is mandatory for all AEMB members). If you would like to learn more about AEMB or start a new chapter at your school, please consider attending this session and speaking to any of the national officers, or stop by our table for more information.

Charting the Landscape of For-Profit Stem Cell Clinics in the US
Session Co-chairs: Emma Frow, PhD, Sara Mohamed, Bahar Dhowan, Dominic E. Nathan, PhD
9:00 am—10:15 am
Room 123
For decades, stem cell researchers and bioengineers have been enthusiastic about the therapeutic promise of stem cells. They argue that the capacity of stem cells to self-renew and differentiate into different cell types can help replenish damaged or lost tissues, and therefore holds great clinical potential for a wide range of medical conditions. This promise has found strong support in the public sphere, helping to underpin significant public investments in stem cell research. In practice, though, the development and successful translation of stem cell therapies into the market has proven challenging. In the US, this translational gap is being colonized by for-profit clinics offering stem cell treatments that have not been reviewed or even submitted to the US Food and Drug Administration (FDA) for regulatory approval. The rise of these clinics has been a quick and recent development. The exact number is unclear; one estimate in 2014 suggested over 100 US-based clinics, but a recent study has identified 570 in the US. There is active debate underway about the legitimacy of the stem cell treatments offered by these for-profit clinics. We see some academic stem cell scientists and bioethicists petitioning the FDA to take action. They portray these clinics as snake oil merchants, offering unproven treatments that are, at best, ineffective but expensive for patients and, at worst, dangerous procedures that put patient health and safety at risk. Many of the for-profit clinics openly acknowledge in their marketing materials that their treatments have not been approved by the FDA. Moreover, they often suggest that FDA approval is not needed for the types of treatments they offer. They argue that the research community has been too slow in developing effective stem cell treatments for patients, and that the traditional research and clinical translation process is too bureaucratic to facilitate real innovation in stem cell therapies. For its part, the FDA has not taken a clear stance regarding for-profit stem cell clinics. Over the past few years, it has investigated a small number of these clinics, but it does not seem to be taking systematic action. This emerging landscape of unregulated stem cell treatments is raising serious challenges to existing modes of clinical practice, scientific methodology, and jurisdiction over medical treatments. It raises timely and important questions for us to discuss, for example about patient rights, the politics of expertise in the face of uncertain knowledge, and professional responsibility in contemporary biomedicine. 1. Turner, L. & Knoppers, B. (2016) Selling stem cells in the USA: Assessing the direct-to-consumer industry. Cell Stem Cell 19: 1-4

How to Advocate for Biomedical Research Funding: Alpha Eta Mu Beta Public Policy Session
Session Co-chairs: Teresa A. Murray, PhD
9:00 am—10:00 am
Room 123
Discover three secrets to making a winning case for federal funding for medical and biological research. Learn practical steps to successfully getting your point across to a member of Congress. Find out how to brand your university lab as a leader in the race to cure cancer, reverse neurodegeneration, or other important field of biomedical research. Arm yourself with the strategies for changing day-to-day’s policy landscape; it might provide the key to funding for your next discovery.

Marjele’s Sports Grill
24 North 22nd Street
Phoenix, AZ 85004

Alpha Eta Mu Beta Reception
Session Co-chairs: Dominic E. Nathan PhD, Bahar Dhowan, Sana Mohamed, Lauren Pruett, Shyanthony Syrigal, Teresa A. Murray PhD, Alicia Fernandez-Fernandez, PhD, DPT, Karri A. Green, MS and Marcia A. Pool, PhD
The Annual AEMB reception will be held at the convention center. Now charters and national awards will be presented at this session. Furthermore, this session will serve as a networking opportunity to meet with other fellow members from AEMB chapters, representatives from industry and academia. This session is open to all AEMB student and faculty members. For tickets, please contact aemb@alphaetamubeta.org
Congratulations to the following Award Winners:

Robert A. Pritzker
Distinguished Lecture Award
Presented at the Thursday morning plenary session at 10:15 am in the North Building, Ballroom BCD

Gordana Vunjak-Novakovic, PhD
Columbia University

The Wallace H. Coulter Award for Healthcare Innovation
Presented at the Friday morning plenary session at 10:15 am in the North Building, Ballroom BCD

Bonnie H. Anderson
Chairman and CEO, Versata

Diversity Lecture Award
Presented at the Friday evening plenary session at 5:15 pm in the North Building, Ballroom BCD

Manu O. Platt, PhD
Georgia Institute of Technology & Emory University School of Medicine

Rita Schaffer Young Investigator Award
Presented at the Saturday morning plenary session at 10:30 am in the North Building, Ballroom BCD

Craig J. Goergen, PhD
Purdue University

BMES Student Chapter Awards
Presented at the Saturday morning plenary session at 10:30 am in the North Building, Ballroom BCD

2017 Outstanding Achievement Award
University of California, San Diego

2017 Commendable Achievement Award
Arizona State University

2017 Outstanding Outreach Program Award
University of Pennsylvania

2017 Outstanding Mentoring Program Award
Clemson University

2017 Outstanding Chapter Industry Program Award
University of Maryland

BMES Journal Paper Awards
Presented at the Friday evening plenary session at 5:15 pm in the North Building, Ballroom BCD

Annals of Biomedical Engineering (ABME)
The Annals of Biomedical Engineering, the BMES flagship journal, offers an Editor’s Choice Award and a Most Cited Article Award. This year’s awards go to:

Editor’s Choice Award
In Vivo Evaluation of Wearable Head Impact Sensors
Lyndia C. Wu, Vaibhav Nangia, Kevin Bui, Bradley Hammoor, Mehmet Kurt, Fidel Hernandez, Calvin Kuo, David B. Camarillo.

Most Cited

Most Downloaded
Fibronectin Mechanobiology Regulates Tumorigenesis
Karim Wang, Bo Ri Seo, Claudia Fischbach, Delphine Gourdon
CMBE Volume 9, Issue 1, pp 1-11 (2016)

Cellular and Molecular Bioengineering

Fellows will receive Awards at the plenary session on Thursday, October 12, 2017 at 5:30pm in North Building, Ballroom BCD.

CONGRATULATIONS!
BMES 2017 CLASS OF FELLOWS

BMES Fellow status is a distinguished honor awarded to members with outstanding qualifications and experience, who have demonstrated exceptional achievement in the field of biomedical engineering. Recipients have also maintained a consistent record of membership and participation within the Society.

FELLOWSHIP RECIPIENTS

Treena Livingston Arinzech, PhD
Gang Bao, PhD
Danny Bluestein, PhD
Thomas Boland, PhD
Stephen A. Boppart, MD, PhD
Juan Carlos Briceño Triana, PhD
Michael S. Detamore, PhD

Stefan M. Duma, PhD
Andrew K. Dunn, PhD
C. Ross Ethier, PhD
Robert D. Frisina, PhD
Steven Carl George, MD, PhD
Bin He, PhD
Andre Levchenko, PhD

David F. Meaney, PhD
Ellis Meng, PhD
Michael I. Miller, PhD
Cynthia Reinhart-King, PhD
Martin L. Yarmush, MD, PhD
Fan Yuan, PhD

Fellows will receive Awards at the plenary session on Thursday, October 12, 2017 at 5:30pm in North Building, Ballroom BCD.
### Industry Programs

#### Wednesday, October 11
- **12:30 pm–3:30 pm** Departures from Convention Center (CC)
- **Industry Tours** pre-registration required
- **7:30 pm–8:30 pm** Sheraton Grand Phoenix, Laveen A Room

#### Thursday, October 12
- **7:00 pm–9:00 pm** The Duce
  - **Industry and Clinical Mixer**
    - **Ticket Purchase Required**
    - Co-chairs: Alex Thomas, University of Colorado, and Stephanie Mansfield, Brooks Kushman
    - Hosted at The Duce, this event is an opportunity for industry professionals and clinicians attending the conference to network in a fun setting. Hors d’oeuvres and one free drink will be provided for those in attendance.

- **8:00 am–9:30 am** Room 122B
  - Training New Leaders in Healthcare Innovation: Graduate Training Programs Linking Engineering and Medicine
  - Chairs: Jennifer Amos, Jeffrey Garanich
  - See page 85

- **1:30 pm–3:00 pm** Room 122C
  - ABET Criteria Workshop
  - See page 93

- **2:30 pm–5:30 pm** Room 122B
  - Defining Educational Goals of Bioengineering in the 21st century
  - Chair: Jennifer Amos
  - See page 94

- **3:45 pm–5:15 pm** Room 122C
  - Vascular Mechanobiology and Nanotherapeutics
  - Chair: Rita Alevriadou
  - See page 103

- **3:45 pm–5:15 pm** Room 122B
  - Engineering Solutions to Address Healthcare Disparities
  - Chair: Gilda Barabino
  - See page 103

### Special Sessions

#### Thursday, October 12
- **8:00 am–9:30 am** Room 122B
  - Training New Leaders in Healthcare Innovation: Graduate Training Programs Linking Engineering and Medicine
  - Chairs: Jennifer Amos, Jeffrey Garanich
  - See page 85

- **1:30 pm–3:00 pm** Room 122C
  - ABET Criteria Workshop
  - See page 93

- **1:30 pm–3:00 pm** Room 121ABC
  - NIH Funding Panel Session
  - See page 94

- **2:30 pm–5:30 pm** Room 122A
  - The 5th US-Korea Joint BMES Workshop
  - Chair: Hanjoong Jo, PhD
  - See page 157

- **3:45 pm–5:15 pm** Room 122C
  - 2017 DEBUT Awards Presentation
  - Chair: Zeynep Erim
  - See page 103

- **3:45 pm–5:15 pm** Room 122B
  - Engineering Solutions to Address Healthcare Disparities
  - Chair: Gilda Barabino
  - See page 103

#### Friday, October 13
- **8:00 am–9:30 am** Room 122C
  - Career Options for the BME Graduate Students and Postdoctoral Fellows
  - Chair: Rita Alevriadou
  - See page 157

- **1:15 pm–2:45 pm** Room 122C
  - Curricular Innovation: Highlighting Your Most Unique or Innovative Course Offerings
  - Chair: Terry Johnson
  - See page 166

- **1:30 pm–4:30 pm** Room 121ABC
  - BMES-NSF Special Session on CAREER and UNSOLICITED Awards
  - Chair: Michele Grimm
  - *additional registration and $10 ticket required* 
  - See page 166

- **3:30 pm–5:00 pm** Room 122A
  - Symposium in honor of Dr. and Mrs. Athanasiou
  - Chair: Michael Dotamore
  - See page 175

#### Saturday, October 14
- **8:00 am–9:30 am** Room 121ABC
  - BMES-NSF Special Session on Graduate Research Fellowships Program
  - Chair: Michele Grimm
  - See page 229
**Thursday, October 12 | 8:00 am–9:30 am | Platform Session 1**

**OP-Thurs-1**

**Track: Biomaterials**

**Biomaterials for Immunengineering I**

Chair: Angela Panerai, Evan Scott

8:00 am

Expansion of T Cells via Poly(Dimethylsiloxane)-based Fibrous Meshes with Tunable Rigidities

Alex Deng, Daniele Bogdanovic, Stacey M. Fernandes, Jennifer R. Brown, Helen H. Liu, and Lance C. Kimm

Columbia University, New York, NY; Dana Farber Cancer Institute, Harvard Medical School, Boston, MA

8:15 am

In Vitro Platform for Characterization of a Immunological Responses to Encapsulated Cells

Anthony Frey, Ting Li, Ethan Yang, Alisson Bayrer, and Cheewa Stabler

University of Florida, Gainesville, FL; University of Miami, Miami, FL

8:30 am

Combined Cancer Chemoimmunotherapy for Elimination of Established Tumors

James Moon, Bai Kuai, Wenmin Yuan, Yao Xu, Yuchen Fan, and Anna Schwendeman

University of Michigan, Ann Arbor, MI

8:45 am

Alpha-helical Peptide Nanofibers as Non-Inflammatory Self-adjuvanting Vaccines

Yanying Wu and Joel Collier

Duke University, Durham, NC

9:00 am

Modified Chitosan-Zein Nano-in-Microparticles For Oral DNA Vaccination

Eric Ferris, Austin Hamelink, Anna Lampia, Amanda Ramer-Tail, Deborah Brown, and Angela Panerai

University of Nebraska-Lincoln, Lincoln, NE

9:15 am

Targeted Extracellular Indoleamine 2,3-Dioxygenase Suppresses Immune Responses In Vitro and In Vivo

Evrim Grillo-Sanchez, Azadeh-Hassanabadi, Kevin Kaenders, Antonietta Restuccia, Margaret Fettis, Mark Walton, Fernanda Rocha, Shannan Wolflet, Gregory Hudda, and Benjamin Kesselras

University of Florida, Gainesville, FL

* **Biomaterials Track sponsored by:**

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**OP-Thurs-1-2**

**Track: Biomaterials**

**3D Printing and Advanced Biomaterial Manufacturing I**

Chair: Donald Griffin, Adam Feinberg

8:00 am

Patient-Specific 3D-Printed Molds for the Fabrication of Cryogel Scaffolds in the Treatment of Pediatric Clef-Craniofacial Defects

Alexa Meloni, Katherine Hsiao, Alexander Lef, Scott Sell, and Andrew Hall

Saint Louis University, Saint Louis, MO; Saint Louis University School of Medicine, Saint Louis, MO

8:15 am

Mass Production of Shaped Particles Through Vortex Ring Freezing

Duo An, Dan Lu, and Minjun Ma

Carnegie University, Ithaca, NY

8:30 am

Designing Shear-thinning Nanoeengineered Ink for 3D Bioprinting

Charles Peak, Jean Stape, and Akhilesh Gaharwar

Texas A&M University, College Station, TX

8:45 am

Mechanically Functional 3D-Printed Bioreosorbable Vascular Scaffolds

Banu Akar, Henry Oliver Ware, Adam C. Farshad, Chongwen Duan, Xiangfeng Chen, Cheng Sui, and Galibem Ameer

Northwestern University, Evanston, IL

9:00 am

Fabrication of 3D Fiber-Collagen Heterocomposites using 3D Near-Field Electrospinning

Pouya Fatahi, Jordan Dawson, and Justin Brown

University of Miami, Miami, FL

9:15 am

3D Printing Bioactive PLGA Cartilaginous Scaffolds

Ting Guo, Casey Lim, and John Fisher

University of Maryland, College Park, MD

*Biomaterials Track sponsored by:*
Thursday, October 12 | 8:00 am–9:30 am | Platform Session 1

**OP-Thurs-1-3**  
**Room 229A**  
**Track: Biomechanics**  
**Head Injury Biomechanics**

- Chairs: Steve Rowson, Jilian Urban

8:00 am  
**Head Impact Exposure Measured During Youth Football Games**  
Bavare Zamzami, Marriele Kelley, Joel Stitzel, and Jilian Urban
Wake Forest School of Medicine, Winston-Salem, NC, Virginia Tech-Wake Forest University, Winston-Salem, NC, Wake Forest School of Medicine, Clinical and Translational Science Institute, Winston-Salem, NC

8:15 am  
**Charactrizing High Magnitude Head Impact Exposure in Youth Football**  
Eamon Campopiano, Ryan Galler, and Steven Rowson  
Virginia Tech, Blacksburg, VA

8:30 am  
**Evaluation of Brain Response Following Head Impact in Youth Female Soccer Athletes Using an Atlas-Based Finite Element Model**  
Huang1, Sanford Bernstein2, and Douglas Swank1

- 1Wake Forest University School of Medicine, Winston-Salem, NC, 2University of Pittsburgh, Pittsburgh, PA, La Sapienza University, Rome, Italy

8:45 am  
**Normal and IUGR Normal and IUGR Placental Chorionic Arteries' Distensibility and Constitutive Modeling**  
There New Saw, Dwan Chia, Cita Nurfanah Zaini Mattar, Arijit Bhowmik, and Choon Wua Yap
National University of Singapore, Singapore, Singapore, National University of Singapore, National Health System, Singapore, Singapore

9:00 am  
**Quantitative Differences Between Probabilistically and Deterministically Predicted Fractures vs. Experimentally Observed Rib Fractures**  
Berkar Khanujapraggi1, Bharat Koyari, Ryan Barnard2, and Scott Gayzik3
Wake Forest University School of Medicine, Winston-Salem, NC

9:15 am  
**Validation of a Finite Element Human Body Model for Spaceflight Testing Configurations**  
Xin Ye1,2, Derek James3,4, James Gaviksey5,6, Kyle McNamara7, Mona Saffarovaz1, Scott Gayzik8, Ashley Weaver1, and Joel Stitzel9
Wake Forest University, Winston-Salem, NC, Virginia Tech-Wake Forest Center for Injury Biomechanics, Winston-Salem, NC

**OP-Thurs-1-5**  
**Room 221A**  
**Track: Cardiovascular Engineering**  
**Angiogenesis and Engineered Vascularization**

- Chairs: Young-seop Yoon, Kara McCloskey

8:15 am  
**Regulatory Inflammation-biased Angiogenesis by Harnessing Macrophage Plasticity**  
Xin Cui1, Renee Morales1, Matija Snuderl2, Raymond Lam3, and James Gaewsky2

- 1University of California, Davis, Davis, CA, 2UC Davis Health, Sacramento, CA

8:30 am  
**Alginite-Chitosan Hydrogels Provide a Sustained Gradient of SIF for Therapeutic Angiogenesis**  
Joao Soares1, Will Zhang1, and Michael Sacks1
University of California, Davis, Davis, CA

8:45 am  
**Optimization of MSC/PS/CSC-EC Vascular Network Formation in Fibroin Scaffolds Using Statistical Design of Experiments**  
Briana Roux1, Ali Cinar1, and Eric Brey2

- 1Institute of Biotechnology, Chicago, IL, 2Edward Hines, Jr. VA Hospital, Hines, IL

9:00 am  
**Diabetes Impairs Vessel Arterio-Venous Specification in Engineered Vascular Tissues in a Perivascular Cell-dependent Manner**  
Wafa Altalhi1 and Sara Nome Vavassore1

- 1University of Toronto, Toronto, ON, Canada, 2University Health Network, Toronto, ON, Canada

9:15 am  
**Restoring the Vascular Regenerative Potential of Diabetic Endothelial Cells Through Spheroid Formation**  
Charlotte Vorwald1, Kerstin Murphy1, and J. Kent Lewis2
University of California, Davis, Davis, CA, 3UC Davis Health, Sacramento, CA

**OP-Thurs-1-6**  
**Room 221B**  
**Tracks: Cardiovascular Engineering, Tissue Engineering**  
**Cardiovascular Tissue Engineering I**

- Chair: Mersha Rolle, Megen McGinn

8:00 am  
**Developmental Biomimry for Maturation of Engineered Human Cardiac Tissue**  
Cassady Rupert1 and Karen Coulombe1
Brown University, Providence, RI

8:15 am  
**Bovine Vein Extracellular Matrix Scaffolds for Use in Coronary Artery Bypass**  
Michelle Lopez-Higuera1 and Leigh Griffiths1

- 1Mayo Clinic Graduate School of Biomedical Science, Rochester, MN

8:30 am  
**3D Populating of a Multi-Component Stem Cell Patch Using Tissue-Specific Bioinks**  
Jinhang Jiang1, Sean Won Kim1, Jo Young Park2, Sang Won Kim3, Sang Hee Moon1, Hun Jun Park2, and Dong Won Cho1

- 1POSTECH, Pohang, Korea, Republic of, 2The Catholic University of Korea, Seoul, Korea, Republic of, 3Pusan National University, Yangsan, Korea, Republic of, 4University National, Yangsan, Korea

9:00 am  
**Stromal Contributions Promote Maturation of Human PSC-Derived Cardiomyocytes in Engineered Cardiac Microtissues**  
Trey Hockway1, Jessica Sepulveda1, Nik Mendis-Camacho1, and Todd McDevitt2

gladstone Institute, San Francisco, CA, Gladstone Institutes, San Francisco, CA, University of California San Francisco, San Francisco, CA

9:15 am  
**Valvular Endothelial Cells Exacerbate Intestinal Cell Matrix Remodeling and Calcification under Mechanistic Constraint Co-Culture Conditions**  
Teresa Gee1 and Jonathan Butcher1  
Cornell University, Ithaca, NY

**OP-Thurs-1-7**  
**Room 221C**  
**Tracks: Tissue Engineering, Biomechanics, Biomechanics and Mechanobiology in Tissue Engineering**  
**Biomechanics and Mechanobiology in Tissue Engineering**

- Chair: Deon Hui-Lee Law, Dong-Heon Kim

8:00 am  
**Mechanical Stretch Alters Corneal Stromal Stem Cell Extracellular Matrix Production**  
Andrew P. Voorhees1, Maritha L. Funderburgh1,2,3,4, Ben Yang1, Bryn Bruegg1, Yi Hua1, Rachael N. Pacheco1,2,3,4, and Ian A. Sigal5
University of Pittsburgh, Pittsburgh, PA, Carnegie Mellon University, Pittsburgh, PA

8:15 am  
**Total Cervical Disc Replacement with Tissue-Engineered Intervertebral Discs Assisted by Remodelable Stabilization System in a Canine Spine Model**  
Jorge Mojica Santiago1, Ibrahim Hussein1,2,6, Geront Lang2, Rodrigo Barrientos1, Crisoplo Wippigh6, Roger Harrel7, and Lawrence Bonassar1

- 1Cornell University, Ithaca, NY, 2Well Cornell Medical College, New York, NY, 3Fresenius Medical Center, Philadelphia, Germantown, SC

8:30 am  
**Finding the Mechanical Properties of De Novo Engineered Tissue in Needled-Nonwoven Scaffolds**  
Jinah Jang1, Seok-Won Kim1, Ju Young Park1, Sung Won Kim2, Sang-Mo Kwon3, Hun Jun Park2, and Dong-Woo Cho1

- 1University of California, San Francisco, CA, 2University of Pennsylvania, Philadelphia, PA, 3Pusan National University, Yangsan, Korea, Republic of

**PLATFORM SESSIONS—THURSDAY—1—8:00 AM—9:30 AM**
**Thursday, October 12 | 8:00 am–9:30 am | Platform Session 1**

**8:45 am**
Shear-Targeted Anti-Thrombotic Drug Delivery Using DNA-Origami Nano-Carriers
Chen Rothman, Roya Shatat, Shmuel Elazar, Hadasian Sevan, and Danny Bluestein
*Stony Brook University, Stony Brook, NY, New York, NY*

**9:00 am**
*In Vivo Efficacy of Targeted Antibiotic Prodrug Polymers AgainstFrancisella Infections*
Daniel Raterman
*University of Washington, Seattle, WA*

**9:15 am**
Orally Deliverable Poly(bile acid) Nanocarriers with High Pancreatic Bioavailability for Treatment of Type 1 Diabetes
Jung Seok Lee, Patrick Hua, Shihan Khan, and Tarek Fahmy
*Yale University, New Haven, CT*

**OP-Thurs-1-13**
Room 228A
**Track: Translational Biomedical Engineering**
**Translational Biomedical Engineering**
Chairs: Thomas Everett, Colin Drummond

**8:00 am**
Electrical Impedance Sensing Biopsy Needle for Translational Biomedical Engineering
Alisa Everett, Jason Pettus, Elias Hyams, and Ryan Hader
*Dartmouth College, Hanover, NH, Dartmouth Hitchcock Medical Center, Lebanon, NH*

**8:15 am**
3D-Printed Breast Cancer Models for Toxicological Screening
Salvador Flores Torres, Ta Li, Jacqueline Kort Mascot, Joyce Jing, and Joseph M Krasa
*McGill University, Montreal, QC, Canada*

**8:30 am**
Quantifying Oxygen-Dependent Blood Flow in Sickle Cell Trait in a Micrometric Platform
Xinran Lu, John Higgins, and David Wood
*University of Minnesota, Minneapolis, MN, Massachusetts General Hospital, Boston, MA, *Harvard Medical School, Boston, MA*

**8:45 am**
Hollow Microcarrier for Large Scale Culture of Anchorage-dependent Cells in a Stirred Bioreactor
Ashanty Heeck-Sartale, Aylin Acun, and Pinar Zorlutuna
*University of Washington, Seattle, WA, Harvard Medical School, Boston, MA*

**9:00 am**
*Ex Vivo Perfusion of Non-Transplanted Human Organs: A New Platform for Quantitative Pre-Clinical Evaluation of Targeted Nanomedicine*
Gregory Tawfik, Sarah Hasgogg, Nancy Kirsieas Smith, Jiaya Gui, Alexandra Fotopoulos-Dragas, Dekahe Ding, Eric Seng, Jenna Dufresne, Raia Al Lamiri, J. Andrew Bradley, Kourosh Saeedi-Parsy, John Bradley, Michael Nicholson, W. Mark Saltmari, and Jordan Poblet
*Yale University, New Haven, CT, University of Cambridge, Cambridge, United Kingdom*

**9:15 am**
Image-guided LED Based Photodynamic Therapy System for Early Oral Cancer Lesions in Global Health Setting
Hsu Liu, Aneel Khan, Shivaliwea Mallidi, Tashiya Haas, and Jonathan Celli
*University of Massachusetts Boston, Boston, MA, *Harvard Medical School, Boston, MA*

**OP-Thurs-1-14**
Room 228B
**Track: Cancer Technologies**
**Cancer Immunoneering**
Cheri Biju Parekkadan, Keyua Shan

**8:00 am**
Elliciting Immunogenic Cell Death Using Prussian Blue Nanoparticle-Based Photothermal Therapy and the Implications for Cancer Therapy
Elizabeth Sweaney, Jukesa Caro-Mayo, Rachael Burger, and Rohan Fernando
*Children’s National Health System, Washington, DC*

**8:15 am**
Biomimetic Biodegradable Artificial Presenting Cells for Enhanced ‘Off-The-Shelf’ Melanoma Immunotherapy
Randall Meyler, John Hickey, Aliya Kosminides, Kelly Rhodes, Alison Bankowski, Jonathan Schmek, and Jordan Green
*Johns Hopkins University, Baltimore, MD*

**8:30 am**
Synthetic Nanoparticle Antibodies for Target Cell Depletion: A Flexible New Tool for Cancer Immunotherapy
Jaying Liu 1, Shohni Ghosh-Choudhury 1, Pallab Pradhan 1, Randall Toy 1, and Krishnendu Roy 1, 2, 3
*Georgia Institute of Technology, Atlanta, GA, Emory University, Atlanta, GA*

**8:45 am**
Utilizing Protein Carriers to Engineer More Potent Cancer Vaccines
Navneet Mehta, Borna Pashaei, Kelly Morupian, Kayra Rehman, Adi Reiner, and Daniel Vitek
*Massachusetts Institute of Technology, Cambridge, MA*

**9:00 am**
*Intratumoral Activation of Dendritic Cells Promotes Systemic Anti-tumor Immunity*
Lauren Milling 1, 2, Nitasha Bennett 2, Talar Tokatlian 2, Nikki Thai 2, and Darrell Irvine 1, 2
*MIT, Boston, MA, *Boston Medical Center, Boston, MA*

**9:15 am**
Recombinase-Based Genetic Circuits for Adoptive T Cell Therapy
Dale E. Jordan 1, 2, 3 and William Wong 1, 2
*Boston University, Boston, MA*

**OP-Thurs-1-16**
Room 226A
**Track: Bioinformatics, Computational and Systems Biology**
**Genomics, Proteomics, and Metabolics**
Chairs: Rajee Sraka, Srikanth Chandrashekarar

**8:00 am**
Time Varying Causal Network Reconstruction of Mouse Cell cycle using Temporal Gene Expression Data
Maryam Masnadi-Shirazi 1, Manju Maurya 2, Gerald Puri 3, Eugene Ke 1, Inder Verma 1, and Shankar Subramaniam
*University of California, San Diego, La Jolla, CA, *Salk Institute for Biological Studies, La Jolla, CA

**8:15 am**
Genome Scale Metabolic Models use Multiple Omics Data to Predict and Characterize Hepatocyte Toxicity
Kristopher Rees 1, Edei Bia 2, Bonnie Dougherty 2, Glynis Kolling 1, Andra Woolfson 1, and Jason Pope 1
*University of Virginia, Charlottesville, VA, *Department of Defense Biotechnology High Performance Computing Software Applications Institute, Fort Detrick, MD

**8:30 am**
A DNA-Encoding Strategy for Integrated Single-Cell Transcriptomics and Proteomics
Alexandra Kupchik, Sarah Johnson, Kaitlyn Takatera, Kelly Liu, and James Heath
*California Institute of Technology, Pasadena, CA*

**8:45 am**
Peripheral Blood Proteome of IPF Diffrs from Normal and Gives Insight into Immunological Processes
Katy Norman, David O’Dwyer 1, Meng Xie, Stephen Gurzynski, Stanis Astarzyk, Erik White, Ken Fishman, Fernando Martinez, Susan Murray, Bethany Moore, and Kelly Arnold
*University of Michigan, Ann Arbor, MI, *Well Cared Medical College, Nashville, TN

**9:00 am**
Fatty Acid Uptake Drives Production of an Inflammatory TH17 Cytokine Signature in Type 2 Diabetes
Elizabeth Proctor 1, 2, Dequina Nicholas 1, Forum Beaw 1, and Katherine Seow 1, 2
*University of Virginia, Charlottesville, VA*

**9:15 am**
Antibiotic Resistant Pseudomonas aeruginosa Exhibits Differential Metabolic Profiles
Laure J. Bushby 1, Phillip Yet 1, and Jason A. Papin 1
*University of Virginia, Charlottesville, VA*
Thursday, October 12 | 8:00 am–9:30 am | Platform Session 1

**OP-Thurs-1-17**

**Room 226B**

**Track: Neural Engineering**

**Neural Cell Model Systems**

Chairs: Abigail Kopparapu, Kyle Lampe

8:00 am

**Improved Neuromuscular Junction-in-a-dish Function Using Mechanically Patterned Substrates**

Cassandra Applegill, Kevin Tenev1, Anastasia Gromova, Frederic Kolb, and Adam Engle

*University of California, San Diego, La Jolla, CA, 2Sanford Consortium for Regenerative Medicine, La Jolla, CA*

8:15 am

**Recapitulating Emergence of Neuromuscular Junctions in a Physiologically Relevant Co-Culture Platform**

Chen Aydil1, Mohamed Elbanna2, Gelson Pagan Diaz3, Redhid Bashi4, and Taher Saif

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

8:30 am

**Gut-Brain-Axis on a Chip: A Microfluidic Model of the Enterointerocrine-Enteric Interface**

Michael Ahmed1, Marilyn Tsui1, and Abigail Kopparapu

*Northeastern University, Boston, MA*

8:45 am

**Axonal Communication Between Cultured Hippocampal Neurons Through Microtunnels**

Daniel Pull1, Andres Ruiz1, Thomas DeMarse2, Gregory Brewer1, Minhal Ahmed1, Marissa Puzan1, and Abigail Koppes1

*Northeastern University, Boston, MA, 2Harvard-MIT Health Science & Technology, Cambridge, MA*

9:00 am

**Mechanotransduction Signaling in Astrocyte Reactivity to High Rate Mechanical Insult**

Nor A Harris, Christopher Coggeshall, Benjamin Walter1

*Virginia Tech, Blacksburg, VA, 2Salem Veterans Affairs Medical Center, Salem, VA*

9:15 am

**Oligodendrocyte Precursor Cell Maturation in a 3D Hydrogel System through the Incorporation of Drug Delivery Nanoparticles and Topographical Cues**

Lauren Basale1, Meghan Pineault1, and Kyle Lampe

*University of Virginia, Charlottesville, VA*

9:45 am

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Lauren Basale1, Meghan Pineault1, and Kyle Lampe

*University of Virginia, Charlottesville, VA*
Platform Sessions—Thursday—2—1:30 PM—3:00 PM

Thursday, October 12 | 1:30 pm–3:00 pm | Platform Session 2

**OP-Thurs-2-1** Room 224A

**Track: Biomaterials**

**Biomaterials for Immunoeengineering II**

Chair: Christopher Jewell, John Wilson

1:30 pm

Mechanism of Adjuvant Action of Supramolecular Peptide Nanofibers

Jai Rudi, Arshad Khan, and Chinnaswamy Jayagannath

*University of Texas Medical Branch, Galveston, TX, University of Texas Health Science Center, Houston, TX*

1:45 pm

A Novel "Anti-Vaccine" for the Treatment of Rheumatoid Arthritis

Rabbi Allen, Jeff Davi, and Yam Loeve

*UC Davis, Davis, CA*

2:00 pm

Biphasic Response of T Cell Activation to Substrate Rigidity

Dennis Jinggu Yuan and Lance Kam

*Columbia University, New York, NY*

2:15 pm

Hydrophilic Titanium Instructs T-cell Populations and MSC Recruitment through Macrophage Activation

Kelly Hotchkiss, Nicholas Clark, and Rene O. Ovare-Navarette

*Virginia Commonwealth University, Richmond, VA*

2:30 pm

Biphasic Response of T Cell Activation to Substrate Rigidity

Dennis Jinggu Yuan and Lance Kam

*Columbia University, New York, NY*

2:45 pm

Supramolecular Peptide Nanofibers as an Active Immunotherapy for TNFa Mediated Inflammation

Yi Wei, Carolina More-Solonan, and Joel Collier

*Oklahoma University, Durham, NC, University of Chicago, Chicago, IL*

*Biomaterials Track sponsored by:*

**OP-Thurs-2-2** Room 224B

**Track: Biomaterials**

3D Printing and Advanced Biomaterial Manufacturing II

Chair: Andrew Hall, Silvia Zuziaik

1:30 pm

Design of Electrohydrodynamic Sprayed Polyethylene Glycol Hydrogel Microfibers for Cell Encapsulation

Anka Gajdov, Er Jan, Grant Kida, Scott Sell, and Silvia Zuziaik

*Saint Louis University, St Louis, MO*

1:45 pm

3-Dimensional Additively Manufactured Ti6Al4V Constructs Enhance Osteoblastic Response

Michael Barger, Sharon Huty, Barbara Boyan, and Zoi Schwartz

*Virginia Commonwealth University, Richmond, VA, Georgia Institute of Technology, Atlanta, GA, University of Texas Health Science Center at San Antonio, San Antonio, TX*

2:00 pm

3D Bioprinting with an Engineering Elastin Like Protein (ELP)

Daniel Meador, Meghan Heffernan, Bruce Corkis, Edi Meaco, and Eric Dufresne

*University of Virginia, Charlottesville, VA*

2:15 pm

Direct 3D Bioprinting of Vascular Network with Smooth Muscle and Endothelium

Haixia Cai, and Lute Grace Zhang

*The George Washington University, Washington, DC*

2:30 pm

The Composition of Alginate/Gelatin Composite Hydrogel Bloions Direct the Formation of Tumor Spheroids

Tao Jiang, Jane GJ, Ming-Qia Lopez, Maeva Melody Barouci, Kevin Gu, Sekade Flores Torrecillo, Jacqueline Kant Massiot, Joel Grant, Sanjay Vajpayee, Antonio De Leon-Rodriguez, and Joseph Matthew Knowles

*McGill University, Montreal, QC, Canada, Instituto Potosino de Investigacion Cientifica, Tecnologica, A.P. (IPICYT), San Luis Potosi, Mexico, Ecole Polytechnique Federale de Lausanne (EPFL), Lausanne, France*

2:45 pm

Development of Complex 3D-printed Microchannels within Biodegradable Hydrogels

Kwanghoon Song, Christopher Highley, Andrew Roelf, and Jason Burdick

*University of Pennsylvania, Philadelphia, PA*

*Biomaterials Track sponsored by:*

**OP-Thurs-2-3** Room 229A

**Track: Biomechanics**

**Head Injury Biomechanics II**

Chair: Sengtuck A, Stefan Duma

1:30 pm

Movement of Human Tympanic Membrane under Blast Exposure Measured by Laser Doppler Vibrometer

Shangyuan Jiang, Kyle Smith, and Ronn Gan

*University of Oklahoma, Norman, OK*

1:45 pm

3D Finite Element Modeling of Blast Wave Transmission from the External Ear to the Cochlea

Matthew Bross, Xiao Ji, and Ronn Gan

*University of Oklahoma, Norman, OK*

2:00 pm

Blast-induced Traumatic Brain Injury Displays a Unique Pattern of Spatial Resolution of Brain NADPH Oxidase

Naim Chandna, K V Rama Rao, Stephanie Irving, Daniel Younger, Anawat Avinard, Bryan Planer, and Meiriy Sokol

*New Jersey Institute of Technology, Newark, NJ*

2:15 pm

Effect of Blast Direction on Shockwave Propagation in the Study of Primary Blast-induced TBI

Hasem Safvadjad Moghadam, Ashkan Esfamianrad, Morteza Zareipour, and Ghodrat Karam

*Harvey Mudd College, Claremont, CA, North Dakota State University, Fargo, ND*

2:30 pm

Quantifying 3D Whole Brain Deformation Using Sonomicrometry During Dynamic Head Rotation Loading and Preliminary Assessment of Brain Finite Element Models

Ahmed Alshareef, A Sebastian Giudici, Jason Forman, and Matthew B. Pancer

*University of Virginia, Charlottesville, VA*

2:45 pm

A Multi-scale Submodeling Technique to Enhance the Spatial Resolution of Simulated Brain Responses

Wei Zhou and Songsong Ji

*Worcester Polytechnic Institute, Worcester, MA*

**OP-Thurs-2-4** Room 229B

**Track: Biomechanics**

**Computation and Multiscale Modeling in Biomechanics I**

Chair: Lucas Tommasetti, Rushabh Amors

1:30 pm

Modeling Tribological Rehydration and Pressure-Driven Fluid Flux in Articular Cartilage

Margar Farnbach, Brian Graham, David Barlow, and Christopher Price

*University of Delaware, Newark, DE*

1:45 pm

Fiber Orientation and Structural Model of Tendon-to-Bone Insertion

Sergey Rozhdestvensky, Senthil Chandrasekaran, and Hsan-Ying Shih-Hwei Huang

*North Carolina State University, Raleigh, NC*

2:00 pm

An Augmented Iterative Method for Identifying a Stress-free Reference Configuration in Image-based Biomechanical Modeling

Manuel Rausch, Martin Garnet, and Jay Humphrey

*University of Texas at Austin, Austin, TX, Universite Paris-Saclay, Paris, France, Yale University, New Haven, CT*

2:15 pm

CFD Analysis of Avian Embryonic Heart Wall with Ultrasound Imaging

Sheldon He, Gernswen Ke Yi Tan, Toan Tran Fooi, Phan Thai Nhan, and Choon Huy Yap

*Nanyang Technological University of Singapore, Singapore, Singapore*

2:30 pm

Modeling 3D Hemodynamics from 2D Angiography Data in Coronary Artery Diseases

Matsuximabreak, John Guardsky, C James Chen, Andrew Kahn, Jinna A. Leopolled, and Amanda Randles

*Duke University, Durham, NC, University of Colorado AMC, Aurora, CO, University of California San Diego, San Diego, CA, Brigham and Women's Hospital, Boston, MA*

2:45 pm

Development of a Non-Newtonian, Three-Dimensional Computational Model for Device-Induced Thrombosis

Ling Yang, Joshua Taylor, Steven Deutsch, and Keefe Manning

*Penn State University, University Park, PA*

**OP-Thurs-2-5** Room 221A

**Track: Cardiovascular Engineering**

**Cardiac Electrophysiology**

Chair: Rakhee Patwardhan, Marked Kamath

1:30 pm

Measurement of Conduction Velocity in Engineered Human Myocardium Expressing Mutant Desmin/Myosin B (4515G)

Ronald Hof and Stuart Campbell

*Yale, New Haven, CT*

1:45 pm

Human Cardiac Tissue Slices - A Novel Platform to Test Cardiototoxicity Of Cancer Drugs.

Sharon George, Sohan Chaudhry, Tanvi Bhatia, and Igor Elmoff

*The George Washington University, Washington, DC*

2:00 pm

Electrophysiological Effects of Sympathetic Stimulation in Human Organotypic Cardiac Tissue Slices

Jaylin Brenner, Chasui Kang, John Giao, and Igor Elmoff

*The George Washington University, Washington, DC*
Thursday, October 12 | 1:30 pm—3:00 pm | Platform Session 2

2:15 pm Spatiotemporal Control of Human Cardiac Tissue Using an Optogenetic Platform

- Stephen Ma,1,2 Lina Hou,1,2 Jun Xian,1,2 Hong Chang,1,2 Masayuki Yazeda1,2, and Gordana Vunjak-Novakovic1
- Columbia University, New York, NY

2:30 pm Geometric Regulation of Conduction Velocity in Engineered Cardiac Tissues

- Andrew5 P. Petersen1, Davi M. Lyn-Lee1, Nathika R. Aryayangha1, Nathan Cho1, Celakse M. Goodson1,2, Joen Young Kim1,2, and Megan L. McCar1
- Laboratory for Living Systems Engineering, Department of Biomedical Engineering, USC Viterbi School of Engineering, University of Southern California, Los Angeles, CA, 1Department of Stem Cell Biology and Regenerative Medicine, Keck School of Medicine of USC, University of Southern California, Los Angeles, CA

2:45 pm A Novel Method for Simultaneous Measurement of Cytosolic and Mitochondrial Calcium in Excitable Cells

- Ningning Xu1, Patrik Emti2, Kah Yong Goh3, Lufang Zhou1, and Margaret Liu1
- The University of Alabama at Birmingham, Birmingham, AL

OP-Thurs-2-6 Room 221B

Tracks: Tissue Engineering, Cardiovascular Engineering

Cardiovascular Tissue Engineering II

- Chairs: Jeffrey Jaeger, Gufusun Dai
- 1:30 pm Mitochondrial Transplantation through Co-incubation into Cardiomyocyte
- Co-ia Para A1, Reimn Zawari1, and Aaran Kheradadi1
- University of California-Irvine, Irvine, CA

1:45 pm Tissue-engineered Ventricle Contraction Evaluated by Pressure-Volume Catherization

- Luke MacQueen1, Sean Sheehy1, Christoph Chantar1, Andrew Capaldi1, Sung-Jin Park2, Jesse Gao3, Patrick Campbell1, John Ferrer1, and Kevin Kil Parker1
- Disease Biophysics Group, Wyss Institute for Biologically-Inspired Engineering, School of Engineering and Applied Sciences, Harvard University, Cambridge, MA

2:00 pm Role of Microfiber Anisotropy and Intercellular Interaction with Endothelial Cells on the Pluripotent Stem Cell-Derived Cardiomyocytes

- Matveev Varjupa1,2, Luqiu Hou1,2, Karina Nakayama1,2, Joseph Kim1,2, 3, Nicholas Mokol3, Oscar Abel2, 3, Evangeline Tastad1, 2, Joseph Wu1,2, and Nian Huang1
- Stanford Cardiovascular Institute, Palo Alto, CA, 1Stanford University, Palo Alto, CA, 2Veterans Affairs Palo Alto Health Care System, Palo Alto, CA

2:15 pm Exercise-Induced Disease Modeling of Familial Cardiomyopathy

- Zhao Ma1, Sangita Prajapati1, Nathaniel Huesch1, Mohammad Mandegar1, Brian Siemens1, Costas Gregoropoulou1, Brian Cornkin1, and Karan Raha1
- 1University of California, Berkeley, Berkeley, CA, 2Gladiate Institute of Cardiomyopathic Disease, San Francisco, CA

2:30 pm Comparison of Candidate Cell Populations for TEHV Recellularization

- Michael Khalilpo1,2, Eric Bush1, Richard Hopkins1, and Gabriel Converse1
- Children’s Mercy Hospital, Kansas City, MO, 1University of Kansas, Lawrence, KS

2:45 pm 3D Bioprinting of Vascularized Cardiac Patch with Anisotropy for Cardiomyocyte Tissue Regeneration

- Haitao Cui1, and Jie Gao2, Ziang Zhu
- The George Washington University, Washington, DC

OP-Thurs-2-7 Room 221C

Tracks: Tissue Engineering, Stem Cell Engineering

Stem Cells in Tissue Engineering

- Chairs: Janet Zaidan, Chandra Kothapalli
- 1:30 pm Nanofibers for Sustained Therapeutic Delivery to Direct Stem Cell Fate
- Lauren Cross1, James Carrow1, Madyson Muscarello1, and Akhilesh Murty1
- 1Texas A&M University, College Station, TX

1:45 pm Low-Intensity Ultrasound Extends Lifetimes of Transplanted Mesenchymal Stromal Cells in Murine Muscle

- Scott Burks1, Matthew Nagle1, Saeheong Kim1, and Joseph Frank1
- 1NYH Clinical Center, Bethlehem, MO

2:00 pm Dynamics of Intracellular Kinetics of Glucose Uptake During Chondrogenesis

- Michele Moretti1, Yves1, Maxoud1, Bernard1, Jean1, Helen1, and Mathieu Baska1
- Case Western Reserve University, Cleveland, OH

2:15 pm Material-Directed Chondrogenic Differentiation Under Dynamic Culture Conditions

- Madelina Smierschynski1, Kirsten Parratt1, and Krishna Gound1
- 1Georgia Institute of Technology, Atlanta, GA

2:30 pm Regulatory Influence of Ultrasound on MSC Chondrogenesis and Directed SOX9 Signaling Pathways

- Anu Subramaniam1, and Neety Sahu1
- 1University of Nebraska, Lincoln, NE

2:45 pm Development of a PDGF-BB Delivery System To Enhance Adipose-Derived Stem Cell-Mediated Bone Regeneration

- Alexandra Rindel1, 2, and Warren Grayson3
- 1Johns Hopkins University, Baltimore, MD, 2Johns Hopkins University School of Medicine, Baltimore, MD

OP-Thurs-2-8 Room 222A

Tracks: Nano and Micro Technologies, Tissue Engineering

Organ-on-Chip Models for Study of Disease and Drug Discovery I

- Chairs: Min-Ho Kim, Domenech Marbella
- 1:30 pm Fibrotic Lung Microtissue Array to Predict Anti-fibrosis Drug Efficacy
- Mohammadali Asmani1, Sanjana Velmurum1, Yan Li1, and Rongbang Zhai1
- 1University at Buffalo, Buffalo, NY

1:45 pm Detecting the Endothelial Conditional Response to Oscillatory Shear Stress

- Yashiaka Sakai1, Song (Ali) Akin1, Theodore Virtue1, and YongTae Kim1
- 1Georgia Institute of Technology, Atlanta, GA

2:00 pm Microengineering of Vascularized 3D Glial Network for the Development of a Neurovascular Unit

- Song Ahn1, Jiwon Yom1, Candace Howell1, and YongTae Kim1
- 1Georgia Institute of Technology, Atlanta, GA

2:15 pm 3D Lymphatics-on-a-Chip to Reconstitute Lymphatic Drainage Function and Lymphedema

- Esak Lee1, 2, and Christopher Chen1
- 1Wyss Institute for Biologically-Inspired Engineering at Harvard University, Boston, MA, 2Department of Biomedical Engineering at Boston University, Boston, MA

2:30 pm The Influence of Patient-Derived Fibroblasts on Breast Cancer Invasion Profile Within a Microfluidic Platform

- Daeh Young1, Haripriya Senthil1, Alexander Kratz1, Eric Barrientos1, Town Nguyen2, Barbara Flack3, and Mehdi Niknafs1
- 1Arizona State University, Tempe, AZ, 2Meyo Clinic, Phoenix, AZ

2:45 pm 3D Microsensors for Electrical Interrogations of Engineered Micro-tissues

- Anna Kalmykov1, Changjin Huang1, Arif Abdullah1, Elnatan Mataev1, and Tzahi Cohen-Karni1
- 1University of Maryland, College Park, MD, 2University of California, Irvine, CA

OP-Thurs-2-9 Room 222B

Tracks: Cellular and Molecular Bioengineering, Biomechanics

Substrate Effects in Mechanobiology II

- Chairs: Daniel Alge, Caliari Steven
- 1:30 pm Effects of Cell Contractility on Dynamic Movement of YAP in Living Cells
- Neeshaa Kusukuri1, Rosa Karavi1, and Allen J. Brirlicher1
- 1McGill University, Montreal, QC, Canada

1:45 pm Mouse Embryonic Fibroblasts Maintain Tissue Homeostasis at the Single Cell Level
- Alisza Zollinger1, Han Xu1, Dimitra Stamos1, and Michael Smith1
- 1Boston University, Boston, MA

2:00 pm Sculptured Thin Films Alter Cellular Actin Features and Transfection Efficiency
- Anu Mantir1, Charles Rots1, Derek Sekora1, Mathias Schubert1, Eva Franke-Schubert1, and Angela K Pannier1
- 1University of Nebraska-Lincoln, Lincoln, NE

2:15 pm Tissue Constructs Stiffen Globally and Locally During Sprouting Angiogenesis
- Benjamin Jum1, Mark Keating1, Ten Kong1, Elliot Botvinick1, and Andrea Patruni1
- 1University of Michigan, Ann Arbor, MI, 2University of California, Irvine, Irvine, CA

2:30 pm Nanopatterned Conductive PEG/Graphene Hybrid Scaffolds for Cardiac Tissue Engineering
- Alex Smith1, Huayi Yang1, Huayi Yang1, Yi Hu1, Jian Liu1, Guanheng Shao1, Ekaterina Napigmiy1, Michael Leflambre1, Charles Murr1, and Dew-Hee Ko1
- 1University of Washington, Seattle, WA, 2Korea Institute of Science and Technology, Seoul, Korea, Republic of, 3University of Toronto, Toronto, ON, Canada

2:45 pm Hydrogel Interfaces with Controlled Rigidity for Ex Vivo T Cell Activation and Expansion
- Derdogol Delcassian1,2,3, Xinying Chen1, Saif Jaffer1,4, Octaviana Onofrei1, and Ian Dunlop1
- 1MIT, Cambridge, MA, 2University of Nottingham, Nottingham, United Kingdom, 3Boston Children's Hospital, Harvard Medical School, Boston, MA, 4Imperial College London, London, United Kingdom

Thursday, October 12 | 1:30 pm—3:00 pm | Platform Session 2
Thursday, October 12 | 1:30 pm–3:00 pm | Platform Session 2

SPECIAL SESSION
1:30 pm–3:00 pm | Room 121ABC
NIH Funding Panel Session
The session will provide an overview of NIH funding opportunities and resources particularly well suited to the BMES research community. NIH Program Officers and awardees will offer insights and “lessons learned” from the perspective of winning these NIH awards as well as in serving on NIH review panels. The session will explore how researchers may develop strategies to align their research interests with NIH opportunities and priorities.

SPECIAL SESSION
1:30 pm–3:00 pm | Room 122B
Defining Educational Goals of Bioengineering in the 21st century
Chair: Jennifer Amos
Speakers:
- Andrew Smith, Associate Head and Assistant Professor of Bioengineering, University of Illinois
- Daniel A. Fletcher, Bioengineer & Biophysics, UC Berkeley
- Alisha Sarang-Siemiński, Associate Professor of Bioengineering, Franklin W. Olin College of Engineering
- Ross Venook, Lecturer Bioengineering Department and BioDesign, Stanford University

Engineers design and create tools, products, and systems that change society and improve the lives of people. The most impactful products are ones that address profound societal and personal needs. We speak of engineering as grand challenges because engineering is essential for addressing urgent societal issues such as combating global climate change, ensuring a secure food supply, or providing sustainable and effective medical care. For our engineering students to be effective at addressing the societal needs posed by these grand challenges, our students must understand the “needs” that require engineering solutions, as well as the science and technologies that make engineering effective.

This session will highlight how 3 institutions are approaching this balance of social needs integration and into BMES Curricula. Following the talks, we will guide discussion on three main discussion points to engage the BIOE community: 1) Is it possible to redesign the curriculum so that societal needs for healthcare and medicine drive the technical content, 2) Can we integrate co-curricular experiences providing insight to the clinical needs and challenges from the freshman year, 3) How do we develop our faculty’s teaching skills to meet these new challenges and foster more project-based and clinically focused curricula.

Thursday, October 12 | 3:45 pm–5:15 pm | Platform Session 3

INDUSTRY SESSION
1:00 pm–2:00 pm | Room 125AB
BMES Special Interest Group Overview
Chair: Christopher Basciano, BIOE
BMES currently has three special interest groups that focused program organization and technical depth to the broad spectrum of disciplines covered by biomedical engineering. The session will allow representatives from each of the three special interest groups (Medical Devices, Cellular and Molecular Engineering, and Advanced Biomaterials) to discuss each group’s current focus, future activities, and recent contributions to the expanding field of biomedical engineering.

*Industry Track sponsored by:

OP-Thurs-3-1
Room 224A
Track: Biomaterials
Biomaterials for Immunoeengineering III
Chair: James Moan, Anir Singh
3:45 pm
Immunologically Active Cryogels for Breast Cancer Therapy
Siddharth Bernard1,2,3
Northeastern University, Boston, MA; Harvard University, Cambridge, MA; The National Center for Scientific Research, Sorbonne Universités, Université de Technologie de Compiègne (UTC), Compiègne, France
4:00 pm
Biomimetic Design of Artificial Lymph Nodes for T-Cell Immunotherapy
John Hickey1, Jin Woock Chung1, Hai-Quan Mao1, and Jonathan Schneck2
Johns Hopkins University, Baltimore, MD
4:15 pm
An Acellular Polymeric Particle-Based Platform for The Highly Efficient Activation and Expansion Of Natural Killer Cells
Kelly Broder1, Randall Mayer1, and Jordan Green2
Johns Hopkins University, Baltimore, MD
4:30 pm
Role of Integrins in Macrophage Activation to Biomimetic Properties
Kelly Hutchiss1, Andy Wu1, Emily Burchn1, and Rene Olivese Navarrete1
Virginia Commonwealth University, Richmond, VA
4:45 pm
The Role of Geometry in T-Cell Stimulation for Adoptive Cell Therapy: An Initial Assessment of Possible Flat Stacked Plates Presenting Key Signals for Enhanced Ex Vivo T-cell Expansion
Robbi Chaudhury1, Christopher Kong1, and Tiank Fahey1
Yale University, New Haven, CT
5:00 pm
Intra-Lymph Node Delivery of Tolerogenic Microparticles Reverses Disease and Prevents Relapse in an Autoimmune Model of Multiple Sclerosis
Emily A. Guseva1, Lisa H. Tostanoski1, and Christopher M. Jewell1,2,3
Fischell Department of Bioengineering, University of Maryland-College Park, College Park, MD; 1Department of Microbiology and Immunology, University of Maryland Medical School, Baltimore, MD; 2Marlene and Stewart Greenebaum Cancer Center, Baltimore, MD; 3United States Department of Veterans Affairs, Baltimore, MD

*Biomaterials Track sponsored by:
Thursday, October 12 | 3:45 pm–5:15 pm | Platform Session 3

**OP-Thurs-3-2**
**Room 224B**
**Track: Biomaterials**
**Advanced Characterization and Imaging of Biomaterial Environments**

**Chairs:** Nicole Iversen, Greg Huddleson

**3:45 pm**
**Direct Imaging of Protein Stability and Folding Kinetics In Hydroids**
Lydia Kiley, Deborah Lesbiak, Martin Gruebele, Kali Serrano, Drahiq Quni, and Xinyu Kong
University of Illinois, Urbana, IL

**4:00 pm**
**Upstream Platelet Priming Effects on Transient Downstream Platelet-Surface Interactions**
Alexandra Zudovas, Elizabeth Pumphord, and Vladimir Hlady
University of Utah, Salt Lake City, UT

**4:15 pm**
**Fabrication of Aligned Collagen Fibers via Microfluidic Device for Observing Keratocyte Behavior**
Kevin Leon, Poukiva Kooman, Kyle Gross, Nihar Tansey, Matthew Petroli, and David Schmidl
UT Dallas, Dallas, TX, UT Southwestern, Dallas, TX, Istanbul Medipol University, Istanbul, Turkey

**4:30 pm**
**Microstructure of Laminin Networks Affects Adhesion to Dystroglycan Null Cells and Downstream Signaling**
Claire Robertson, Ariel Kent, Neima Mayer, and Mina Bissell
Lawrence Berkeley National Lab, Berkeley, CA

**4:45 pm**
**Flow Induced Liposome Recovery into a Lipid Bilayer on Solid Surfaces using QCM-D**
Christina Bailey, Arushbad Trisala, and Anita Shukla
Brown University, Providence, RI

**5:00 pm**
**The Effects of Spatial Confinement on Metastatic Cancer Cell Migration in 3D Collagen Microtracks**
Anissa Bahrami, Aabidah Jan, Andreas Herrmann, David Ebbert, and Cynthia Rainhart King
Cornell University, Ithaca, NY, Vanderbilt University, Nashville, TN

*Biomaterials Track sponsored by:*

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**OP-Thurs-3-3**
**Room 229A**
**Track: Biomarkers**
**Brain Biomarkers and Mechanobiology**

**Chairs:** Raj Pruthi, Adam Bartsch

**3:45 pm**
**Viscoelastic Characterization of the White Matter Brain Tissue via Indentation: An Experimental and Theoretical Study**
Anel Samedli Dooki and George Voyadgis
Louisiana State University, Baton Rouge, LA

**4:00 pm**
**Solid Tumor from Impairs the Surrounding Brain Vascular Perfusion and Neuronal Function**
Istvan University of Pittsburgh, Baltimore, MD, University of Technology, Denmark, MD

**4:15 pm**
**Mechanical Properties of Glial Cells in 3D Scaffolds**
Amy Daghi, KT Ramesh, Lababban Rashed, Arun Venkatesan, Santiago Orrego, and Susan Hong Kong
Johns Hopkins University, Baltimore, MD, Johns Hopkins Medical Inst, Baltimore, MD

**4:30 pm**
**Astrocyte Mechanobiology and Regulation of the Extracellular Matrix Environment**
Gabriel Compton, Addison Walker, Abby Tefelsow, Jacob Schulte, Ethan Elchcin, Karthik Balachandann, and Jeffrey Wolchok
University of Arkansas, Fayetteville, AR

**4:45 pm**
**Appropriateness of Biphasic Porous Constitutive Models for Estimating Brain Biomarkers Under Surgical Load**
Sarani Narasimhan, Jared A. Wies, Reid C. Thompson, and Michael I. Milas
Cornell University, Ithaca, NY, Vanderbilt University Institute for Surgery and Engineering, Nashville, TN, Vanderbilt University Medical Center, Nashville, TN

**5:00 pm**
**Three-dimensional Human Brain Models under Mild Angular Acceleration using Material Point Method**
Yuan-Chiao Lu, Nitin Daphalapurkar, Kaitan Ramesh, Andrew Knutten, Daung Pham, Philip Brayl, and Jerry Prince
Johns Hopkins University, Baltimore, MD, Henry M. Jackson Foundation, Bethesda, MD, Washington University in St. Louis, St. Louis, MO

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**OP-Thurs-3-4**
**Room 229**
**Track: Biomimetics**
**Computational and Multiscale Modeling in Biomimetics II**

**Chairs:** Will Richardson, Taeyoon Kim

**3:45 pm**
**Coarse-Grained Model of SNARE Shows that Pool Assembly Is Required for Quick Zippering and Determines the Number of SNAREs Required for Docking**
Nicole Fontes, Maria Bykhovskaia, and Anand Jagota
Lehigh University, Bethlehem, PA, Wayne State University of Medicine, Detroit, MI

**4:00 pm**
**The Versatile Micromechanical Model of Cell Migration**
Abdel Rahman Hassan, Thomas Bell, and Taeyoon Kim
Purdue University, West Lafayette, IN

**4:15 pm**
**Application of Filopodial Mechanosensing of Surrounding ECM Stiffness to Modeling of Directed Cancer Cell Invasion Dynamics into 3D ECM**
Min-Chae Kim, Rohan Abeyaratne, Roger D. Kamm, and H. Harry Asada
Massachusetts Institute of Technology, Cambridge, MA, Singapore MIT Alliance Research Technology, Singapore, Singapore

**4:30 pm**
**A Coupled Chemo-Mechanical Cell-Matrix Model to Predict Mechanical Feedback Between Cells and Extracellular Matrices**
Farid Alkhalaf, Matthew Hall, Mingming Wu, and Vivek Shenoy
University of Pennsylvania, Philadelphia, PA, Cornell University, Ithaca, NY

**4:45 pm**
**A Multiscale Model of Leukocyte Transendothelial Migration During Atherogenesis**
Rita Belue and Heather Hayenga
University of Texas at Dallas, Richardson, TX

**5:00 pm**
**A Coupled Agent Based Model-Finite Element Analysis Model of Vascular Adaptation**
Mazayr Kashvarzian, Clark Meyer, and Heather Hayenga
University of Texas, Dallas, Richardson, TX

**5:15 pm**
**A Non-invasive Method to Estimate In Vivo Strains of the Mitral Valve**
Bruno Reggi, Amir Khajavi, Andrew Drash, Joseph Gorman, Robert Gorman, and Michael Sacks
University of Texas at Austin, TX, University of Pennsylvania, Philadelphia, PA

**4:15 pm**
**Label-Free Metabolic Biomarkers for Assessing Calcific Aortic Valve Disease Progression**
Ishita Tondoli, Olivia Kalens, Kyle Quinn, and Kartik Balachandran
University of Arkansas, Fayetteville, AR

**4:30 pm**
**Targeting Cadherin-11 Prevents Notch1-mediated Calcific Aortic Valve Disease**
Cynthia Clark, Megan Bowler, J. Caleb Snyder, and W. David Merrill
Vanderbilt University, Nashville, TN

**4:45 pm**
**Investigating Effects of the 3D Extracellular Environment on Aortic Valve Cell Calcification Using Filter Paper Platform**
Madeline Monroe, Rebecca Nikitosenko, Matthew Sapp, and K. Jay Grandi-Aiken
Rice University, Houston, TX

**5:00 pm**
**The Three-Dimensional Microenvironment of the Mitral Valve: Insights into the Effects of Physiological Loads**
Sahra Ayvaz, Karen Tan, Amir Khajavi, and Michael Sacks
The University of Texas at Austin, Austin, TX

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**OP-Thurs-3-5**
**Room 221B**
**Track: Cardiovascular Engineering**
**Cardiovascular Tissue Engineering III**

**Chairs:** Eno Ebong, Bin Duan

**3:45 pm**
**A Flexible Wireless Passive Stimulator for Engineered Cardiac Tissue Construct**
Shiyi Liu, Ali Nawaf, Medhi Nikkhah, and Junseok Chae
Oregon State University, Tempe, AZ

**4:00 pm**
**Cellular Interactions in Cardiac Tissue Engineering**
Spencer March, and Agneta Simoncici
Clemson University, Greenville, SC

**4:15 pm**
**Using Extracellular Matrix Peptides to Increase Endothelialization of Poly(Vinyl Alcohol) Vascular Grafts Without Increasing Thrombosis**
Deondre Anderson, Kate Trosng, Evelyn Yim, and Michelle Hinds
Oregon Health & Science University, Portland, OR, University of Waterloo, Waterloo, ON, Canada
Thursday, October 12 | 3:45 pm–5:15 pm | Platform Session 3

3:45 pm 3D Mesoscopic Fluorescence Tomography for Imaging Micro-distribution of Antibody-photob Assorber Conjugates during Photoinmunotherapy In Vivo
Qinggong Tang1, Tatadzso Nupeya1, Yu Li2, Jonathan Lin1, Hannah Harr1, Kasabatu Nakayakala3, and Yu Chien1
1University of Maryland-College Park, College Park, MD  2National Cancer Institute, Bethesda, MD
3:45 pm Optical Imaging of Field Cancerization in the Oral Cavity
Dalton Lay1, Olivia Kolan1, Jake Jones1, Kyle Quinn1, and Narasimhan Rajan2
1University of Arkansas, Fayetteville, AR
4:45 pm Optical Metabolic Imaging of Cerebral Cancer-derived Organoids to Quantify Heterogeneous Oxygen Levels in 5-Fluorouracil
Halsey Jansen1 and Timothy Muldress
1University of Arkansas, Fayetteville, AR
5:00 pm Small Molecule FAP-α Inhibitors For Targeted Molecular Imaging Of Tumor Microenvironment
Stephanie Stena1, Alan Losick1, Steven Rowe1, Polyna Syva Shahi1, Yogendra Srinivasan2, and Shweta Walekar1
1Georgia Institute of Technology, Atlanta, GA  2Georgia Tech Research Institute, Atlanta, GA

OP-Thurs-3-13  Room 228A

Tracks: Respiratory Bioengineering, Biomedical Imaging and Optics

Imaging and Translational Respiratory Engineering

Chairs: Jimmy Abbas, Tilo Winkler

3:45 pm Frequency-Selective CT Image Registration for Assessment of Regional Periodic Lung Deformation
Nacht Henn1, Wei Shao1, Joseph Reinhardt2, Eric Hoffman2, Gary Christensen1, and Daniel Karcia1
1University of Iowa, Iowa City, IA
4:00 pm Machine-Vision Guided Spatially Targeted Drug Delivery in the Lungs
Zhao Guo1, Brandon Guerrant2, John O'Neill2, Stephen Na1, Meera Cheerharan1, Matthew Bacchetta1, and Gordana Vunjak-Novakovic2
1Columbia University, New York, NY
4:15 pm Super Clusters in Emphysema: A 3D Power Law and Fractal Analysis of Disease Distribution
Jared McManus1, Hardik Patel1, Patricia Fiacco1, Douglas Munro1, Susumu Sato1, Tianyu Hui1, and Bile Suki1
1Boston University, Boston, MA  2Northwestern University, Chicago, IL  3Kyoto University, Japan

OP-Thurs-3-14  Room 228B

Track: Cancer Technologies

Tumor Microenvironment II

Chair: Shipta Sax, Callan Steven

3:45 pm PETN DNP Infection of Pancreatic Cancer Associated Fibroblasts Decreases Hydraulic Permeability Through Hypouronan and AKT Signaling in a 3D Microfluidic Tumor Stroma Model
Alex Avendano1, Jonathan Chang1, Christina Ennis2, Jason Pitarresi3, and Zachary Therneau1
1University of California, Los Angeles, Los Angeles, CA  2University of Texas at Austin, Austin, TX  3University of Pennsylvania, Philadelphia, PA
4:00 pm Hyaluronidase-Activated, Brain-Mimetic Hydrogel Platform to Study Glioblastoma Resistance to EGFR Inhibition
Weikun Yao1, Songbo Zhang1, Akhiya Sobol2, Songyun Sun1, Archana Ehsaanipur1, Chris Wallhiser1, Jesse Liang1, Lisa Tal1, David Nathenson1, and Stephen Sedat1
1University of California, Los Angeles, Los Angeles, CA
4:15 pm Modeling Breast Cancer Metastasis in a Tissue Engineered Organotypic Model
Julie Adams1, Jamie Barlow2, Matthew Zunke1, Yoshibi Toyoda1, Andrew Alsadew1, Sarah Kanjee1, Omar Kaymakcilar1, Alessia Lin1, Peter Torralba1, John Morgan1, and Jason Speczor1
1Weill Cornell Medical College, New York, NY  2Carnegie Mellon University, Pittsburgh, PA
4:30 pm Increase in ECM Stiffness Results in a More Mesenchymal Phenotype in Murine Epithelial Cells
Shane Allen1, Viktoria Rybakova1, and Laura Suggs1
1The University of Texas at Austin, Austin, TX
4:45 pm Changes in Extraglomerular Matrix Structure Due to Fibroblast Genotype Direct Cancer Cell Behavior
Carin Jones1, Edna Cukierman1, Anna Hammer1, Michael Ostrowski1, and Jennifer Leigh1
1The Ohio State University, Columbus, OH  2Fox Chase Cancer Center, Philadelphia, PA

OP-Thurs-3-15  Room 227C

Track: Cancer Technologies

Metastasis, Dormancy & Treatment Response

Chairs: Meni Paiz, Jungwoo Lee

3:45 pm In Vivo, Multi-Organ Examination of Cancer Cell Trafficking and Extravasation in Early Metastatic Dissemination
Colin Paul1, Kevin Bishop2, Alexis Devine1, Nicole Morgan1, Elliott Pardee1, Lisa Jenkins1, Raman Soord1, and Kandice Tanner1
1National Cancer Institute, Bethesda, MD  2National Human Genome Research Institute, Bethesda, MD  3National Institute of Biomedical Imaging and Bioengineering, Bethesda, MD
4:00 pm Single Cell Dynamic Transcription Factor Programs Driving Colonization of the Metastatic Niche
Matthew Hall1, Joseph Decker2, Robert Clague1, and Lionel Sheh1
1University of Michigan, Ann Arbor, MI
4:15 pm Enhancing Radiation Response of Head and Neck Tumor Xenografts Using Novel Tridimensional Optical/ MR/X-ray Contrast Nanoconstructs
Gayatri Sharma1, Abdul Parchur1, Jaidip M. Jagtap1, Brian Fish1, Bergom Carmen1, Meeta M Medhora2, Michael J. Fliaster1, and Amrit J. Virdee1
1Department of Biomedical Engineering, Medical College of Wisconsin, Milwaukee, WI  2Department of Radiation Oncology, Medical College of Wisconsin, Milwaukee, WI  3Department of Physiology, Medical College of Wisconsin, Milwaukee, WI
4:30 pm Effects of HDAC Inhibitors on Breast Cancer Cell Phenotype in a Microengineered 3D Invasion Assay
Eric Barrientos1, Nithal Peeel1, Darsh Tooss1, Tran Nguyen1, Ghasan Mouneimne1, and Mehdi Nikkhah1
1Arizona State University, Tempe, AZ  2University of Arizona, Tucson, AZ
Thursday, October 12 | 3:45 pm–5:15 pm | Platform Session 3

OP-Thurs-3-17 Room 226B

**Track: Neural Engineering**

**Peripheral Repair**

*Chairs: Rebecca Wachi, Mario Romaro-Ortega*

**3:45 pm**

*A Microfluidic Platform to Study the Effects of GDNF on Neuronal Axon Entrapment*

Za Zhang†, Matthew D. Wooldridge, Susan E. Macklin, and Shelly E. Saxman-Elbert†

†Washington University in St. Louis, St. Louis, MO, †Washington University School of Medicine, St. Louis, MO, †University of Texas at Austin, Austin, TX

**4:00 pm**

*Application of Lysophosphatidylcholine and Nerve Growth Factor for Nerve Regeneration*

Ananya Chakraborty, Ryan Ward, Keaton Karlfus, Austin Thompson, Mark Rigby, Sarah Coffin, William Pitt, Beverly Roeder, and Scott Steffen

†Brigham Young University, Provo, UT

**4:15 pm**

*Gelatin/Tropoelastin Hydrogel Composites for Peripheral Nerve Repair*

Jonathan Soucy, Elhadi Shtraibman, David Diaz Vera, Roberto Portillo Lara, Abigail Koppes, Ryan Koppes, and Hew-Ammabo†

†Northern Arizona University, †Baltimore, †MIT HS, †Cambridge, MA

**3:45 pm**

*Improving Nerve Growth Conduits with Aligned Nanofibers, Growth Factors, and Physical Therapy*

Tanya Whitehead, Elizabeth Mayo, Jean Pederson, Aussadibah Mashahri, Chiyang Chen, John Cavanaugh, and Harin Sundaramasu†

Wayne State University, Detroit, MI

**4:45 pm**

*Microprint Release of Sema3A Selectively Blocks Pain Fibers, While Allowing Other Fibers to Grow Towards Molecular Attractants*

Brian Heddle, Sanjay Anand, and Mario Romaro-Ortega†

University of Texas at Dallas, Richardson, TX

**5:00 pm**

*Uptake of Cholera Toxin B Modified Protocells in Phrenic Motorneurons*

Maria Gonzales-Ponce, Jeffrey Birnkrant, Gary Siew, and Carilo Mantilla†

†Mayo Clinic, Rochester, MN, †University of New Mexico, Albuquerque, NM

**SPECIAL SESSIONS**

**3:45 pm–5:15 pm | Room 122C**

**Vascular Mechanobiology and Nanotherapeutics**

*Chair: Rita Alexiadou*

**Speakers:**

- Yen Fang, PhD, Department of Medicine (Pulmonary, and Critical Care), University of Chicago, Chicago, IL
- Kaustab Ghosh, PhD, Department of Bioengineering, University of California, Irvine, CA
- Hanjoong Jo, PhD, Department of Biomedical Engineering, Georgia Tech/Department of Medicine, Emory University, Atlanta, GA
- Craig Duvall, PhD, Department of Biomedical Engineering, Vanderbilt University, Nashville, TN
- James Dahman, PhD, Department of Bioengineering, Georgia Tech, Atlanta, GA
- B. Rita Alexiadou, PhD, Department of Biomedical Engineering, Ohio State University, Columbus, OH

This session is jointly sponsored by Cardiovascular Engineering and Biomaterials/Drug Delivery tracks, and its focus is on translational aspects of vascular mechanobiology, in particular how to prevent and treat cardiovascular disease using nanotechnology approaches that target gene/protein markers of vascular dysfunction.

**3:45 pm–5:15 pm | Room 121ABC**

**2017 DEBUT Awards Presentation**

*Chair: Zeynep Erüm*

The National Institute of Biomedical Imaging and Bioengineering (NIBIB) and VentureWell have come together to support and expand the Design by Biomedical Undergraduate Teams (DEBUT) challenge, which recognizes undergraduate excellence in biomedical design and innovation. This special session will feature presentations from the 2017 winning teams followed by an award ceremony. A former award winner will also share their perspective of the DEBUT Challenge and the role it played in their success in commercializing a design. This is a unique opportunity for aspiring design engineers, future DEBUT applicants, and future entrepreneurs to be inspired and learn more about the Challenge competition and its impact.

**3:45 pm–5:15 pm | Room 122B**

**Engineering Solutions to Address Healthcare Disparities**

*Chair: Ghida Barabino*

Health and health care disparities remain a costly and burdensome challenge in the U.S. and pose a serious threat to continued improvement in overall quality of care and population health. Biomedical engineers are well positioned to employ novel biodesign strategies toward the elimination of these disparities. This interactive session will explore approaches for research and education related to the application of biomedical technologies and engineer-
POSTER SESSION—THURSDAY

POSTER SESSION—THURSDAY

Track: Biomaterials

3D Printing and Advanced Biomaterial Manufacturing

TH-1 Collagen Type-1 Hybrid Bioink for 3D Printed Microenvironments
Andrea Mazzocchi1, Shay Soker1,2, and Aleksander Skardal2
1Wake Forest Institute for Regenerative Medicine, Winston-Salem, NC, 2Virginia Tech-Wake Forest School of Biomedical Engineering and Sciences, Winston-Salem, NC

TH-2 Incorporation of Growth Factor Mimetic Peptides into GelMA Bioinks
Jimmy Su1, Patrick Thayer2, and Hector Martinez2
1Northwestern University, Evanston, IL, 2CELLINK LLC, Blacksburg, VA

TH-3 Meniscus Guided Printing of Collagen Fiber Patterns Capable of Controlling Cell Morphology
Justin Janiecke1
1University of Texas, Arlington, Arlington, TX

TH-4 Synthesis and Characterization of Microparticles for Templating Porous Shape Memory Polymer Scaffolds
Nazar Babakirov1, Grace Fletcher1, Mary Beth Monroe1, and Duncan Macfarlan2
1Texas A&M University, College Station, TX

TH-5 Development of a Scaffold-Free, Three Dimensional Bioprinter that Utilizes Cellular Spheroids
Wesley Lafargue1, Sachiyo Matesappally2, Joel Berry1, and Jianyi Zhang1
1University of Alberta at Birmingham, Birmingham, AL

TH-6 Muscle Cell Driven Graphene Transfer on the Three Dimensional Printed Hydrogel
Yongheok Kim1, Gelson Pagan-Diaz1, and Rashid Bashir1
1University of Illinois at Urbana-Champaign, Urbana, IL

Track: Biomaterials

Biomaterials - Other / Non-Specified

TH-7 Hydrophilic Topcoat on NO-Releasing Surfaces for Enhanced Antibacterials and Antifouling Properties
Christina Workman1, Priyadarshini Singha1, Jitendra Pant1, Marcus Goudie1, and Hitesh Handa1
1University of Georgia, Athens, GA

TH-8 Engineering Biomimetic Magnetic Liposomes Inspired from Red Blood Cell
Colin Ferrel1, Tuyen Nguyen1, Arunkumar Pitchaimani1, and Santosh Aryal1
1Kansas State University, Manhattan, KS

TH-9 Investigative Studies of a AuNP Viscoelastic Collagen for Disc Degeneration
Janae Bradley1, Sheila Grant1, and David Grant1
1University of Missouri, Columbia, MO

TH-10 Novel Size Sieving Materials for the Target Protein Purification
Kaiqing Xing1, Semonui Akuokun Liu2, Lihua Zhang1, and Yuku Zhang1
1Dalian Institute of Chemical Physics, Chinese Academy of Sciences, Dalian, China, Peoples Republic of

TH-11 Do Insect Tracheal Tubes Collapse Under Pressure as Thin-walled Cylinders?
Khaled Adjerid1, Rafiha De Vita1, and Jake Socha1
1Virginia Tech, Blacksburg, VA

TH-12 New Approaches to Engineering Anti-biofilm Surfaces
Nicolas Lavielle1, Dalal Asker1, and Benjamin Hatton1
1University of Toronto, Toronto, ON, Canada

Track: Biomaterials

Natural and Bioinspired Biomaterials

TH-13 Hydrophilic Topcoat on NO-Releasing Surfaces for Enhanced Antibacterials and Antifouling Properties
Christina Workman1, Priyadarshini Singha1, Jitendra Pant1, Marcus Goudie1, and Hitesh Handa1
1University of Georgia, Athens, GA

TH-14 Improving the Activity of Cellulolytic Enzymes by Modifying Molecular Interactions
Hengameh Shams1, Abigail A. Landers1, and Mohammad R. K. Mofrad1
1University of California, Berkeley, Berkeley, CA

TH-15 Characterizing Biomaterials Using Vibrating Glass Tube Mass Sensors
Heran Bhakta1, Shirin Mesbah-Oskui1, Huinan Liu1, and William Grover1
1University of California, Riverside, Riverside, CA

TH-16 Biomineralization of Calcium Oxalate Mimicking Kidney Stones with Citrate-Induced Inhibition: Changes in Crystal Structure and Hydration State
Jodi K. Finlay1, David J. Banner2, Emre Fritar1, Raza Shahbazian-Yassar1, and Tolou Shokuhfar3
1University of Illinois at Chicago, Plainfield, IL, 2University of Illinois at Chicago, Urbana, IL, 3University of Illinois at Chicago, Chicago, IL

TH-17 Evaluation of the Antimicrobial Activity of Glycerol Monolaurate-Coated Hernia Repair Meshes
Mikhail Bredekhin1, Dmitry Gill1, William Cobb1, and Alexey Vertegel1
1Clemson University, Clemson, SC, 2Greenville Health Center, Greenville, SC
TH-18 Novel Tintana-Incorporated Bioactive Glass Coating for Surgical Implants: Mechanical Characterization

Omar Rodriguez1,2, Ali Matinmanesh1,2, Sunjeev Phull1, Emil Coating for Surgical Implants: Mechanical Schemitsch 2, Paul Zalzal3,4, Owen Clarkin5, Marcello Papini1, and Toronto, ON, Canada, 3McMaster University, Hamilton, ON, Canada, 4Stanford University, Stanford, CA, 5Boise State University of Cincinnati, Cincinnati, ON, Canada

TH-19 Study of Interactions Between Carbon Nanotubes and a Flagellin-Specific Library of Tripeptides

Shruti Singh1, Ihsa Choudhury1, Prabir Patra1, and Isaac Macwan1
1University of Bridgeport, Bridgeport, CT

TH-20 Evaluation of In Vitro Biocompatibility of PMMA Cements During the Curing Phase of Polymerization using a Mouse MC3T3-E1 Preosteoblastic Cell Line

Weiping Ren1, Wei Song1, and David Markel1
1Wayne State University, Detroit, MI, Providence Hospital, Southfield, MI

Tracks: Stem Cell Engineering, Tissue Engineering
Advanced Biomaterializing and Translation of Stem Cell-Derived Therapies and Tissues

TH-21 Stem Cell-Derived Matrices Generated in Suspension Culture for Bone Repair
Candice Sean1, Evin Moffet1, Briag Clough1, Sravani Jaligama1, Jun Kameoka1, Carl Gregory1, and Roland Kaunas1
1University of Bridgeport, Bridgeport, CT

TH-22 Enhanced Production of Therapeutic Mesenchymal Stem Cell Extracellular Vesicles via Control of Culture Parameters
Divya Patel1, Kelsey Gray1, Yasasvhinie Santharam1, Tek Lamichhane1, Candice Sears1, Eoin McNeill1, Bret Clough1, Sravani Jaligama1, Jun Kameoka1, Carl Gregory1, and Roland Kaunas1
1University of Bridgeport, Bridgeport, CT

TH-23 Islet Organoid Biofabrication
Kaming Ye1,2, Xiaojia Li1, and Shuyuan Jiang1
1Binghamton University, SUNY, Binghamton, NY

TH-24 Oxygenation Enabled 3D Stem Cell Differentiation for Generating Islet-like Tissues
Sujayana Sathyarayana Karanth1, Huanyuan Bi1, Xiaofei Li1, Jianer Guan1, Kaming Ye1,2, Xiaofei Li1, Jianer Guan1, and Shuyuan Jiang1
1Binghamton University- State University of New York, Binghamton, NY, The Ohio State University, Columbus, OH

TH-25 Developing a Novel Dual-Chambered Bioreactor to Facilitate the Differentiation of Stratified Tissue Grafs
Jay Sooyeonanwarathan1, Jason Havner1, and John Fisher1
1University of Maryland, College Park, MD

Track: Bioinformatics, Computational and System Biology
Analysis of Multi-Cellular Systems

TH-26 A Mechanism-Free approach to Determine Multiaxial Coexistence
Felun Wu1, Allison Meade1, Darnel Needs1, Sayan Mukherjee1, Charlotte Lee1, and Lingzhong You1
1Duke University, Durham, NC

TH-27 Global Metabolic Interaction Network of the Human Gut Microbiota for Context-Specific Community-Scale Analysis
Jiwook Shim1,2, Ankit Rana1,2, and Leyla Esfandiari1
1Rice University, Houston, TX, 2Brown University, Providence, RI

TH-28 Immunology Modelling via StarCraft 2 Engine
Luke O’Donnell1
1Marquette University, Milwaukee, WI

TH-29 Computational Modeling of Tuberculosis Granuloma Activation
Steve Ruggero1, Minu Phukan1, and Ashlee Ford Versypt1
1Georgia Institute of Technology: Atlanta, GA

TH-30 Automatic Characterization of Complex Cell Shapes and Patterns in Biological Data
William Pitcher1 and Denis Typanyuk1
1Georgia Institute of Technology: Atlanta, GA

Track: Nano and Micro Technologies
Applications of Nanopores and Nanoparticles

TH-33 Developing Cadmium-Free, Near Infrared-Emitting Quantum Dots for Molecular Phenotyping of Tumors
Alexander Saebae1, Thuy Nguyen1, Reyanne Toufanian1, Shikha Javed1, Margaret Chen1, and Allison Dennis1
1Boston University, Boston, MA

TH-34 Fabrication of Novel and High Performance Graphene Quantum Dot Poly-pyrrole (QDP-Ppy) Nanocomposites for Hybrid Supercapacitor Electrodes
Akhana Kalluri1, Devon Leighton1, Soujanya Sathyanarayana Karanth1, Prabir Patra1, and Prabir Patra1
1University of Bridgeport, Bridgeport, CT

TH-35 Hyperthermia-Inducing Nanoparticles as Adjuvant Chemotherapy for Ovarian Based Cancer
Bing McArdy1, Ragunath Singh1, and Nicola Lou-Polychaenko1
1Wake Forest University, Winston-Salem, NC

TH-36 Colorimetric Biochip Sensor in Protein Detection Utilizing Capacitive Biomarker Detection
Linlin Zhang1, Sheng Tong1, Qingbo Zhang2, Vicki Colvin2, and Gang Bai1
1Rice University, Houston, TX, 2Brown University, Providence, RI

TH-37 Nanowarming Using Stable Microwave Heating Solutions
Eman Shreteh1, Andrea Ciuu Lam1, and Carlos Rinaldi1
1University of Florida, Gainesville, FL

TH-38 Lipid Chain Length Improves Stability of Nano-sized Ultrasound Contrast Agents In Vitro
Gabriella Foranov1, Christopher Hernandez1, and Aigata Einer1
1Case Western Reserve University, Cleveland, OH

TH-39 Detection of Methylation in DNA using Nanopores in MoS2 Membrane
Joachim, Ianchev1, Shrouk Banezic1, Hu Qu1, Kirby Smith1, David Estrada1, Julian Bella1, Eric Pop1, and Rashid Bashir1
1Brown University, Providence, RI, 2University of Illinois, Urbana, IL, 3Nanjing University of Aeronautics and Astronautics, Nanjing, China, People’s Republic of: Stanford University, Stanford, CA, 4Baylor State University, USA, 5IBM State University, USA, USA

TH-40 Nanoparticle Contrast Agents for Photoacoustic Imaging and Photothermal Ablation of Ovarian Cancer
Joel Lu1, Christopher Miranda1, and Barbara Smith1
1Arizona State University, Mesa, AZ, 2Arizona State University, Tempe, AZ

TH-41 Enriching Nanoparticles via Acoustofluidics
Jiwook Shim1,2, Adam Haddad1, Francesco Costanzo1, and Tony Huang1
1Duke University, Durham, NC, 2The Pennsylvania State University, State College, PA

TH-42 Synthesis and Anti-tumor Properties of Silver-coated Gold Nanorods
Junyan Zhang1, Mian Wang1, Di Shi1, and Thomas J. Webster1
1Northeastern University, Boston, MA

TH-43 The Effect of Magnetic Nanoparticle Hyperthermia on the Antibiotic Susceptibility of Staphylococcus Aureus Biofilm
Layla Almutairi1, Bing Yu1, Mitchell Filka1, and Min-Ho Kim1
1Kent State University, Kent, OH

TH-44 Particle Entrapment by an Integrative Insulator-Based Dielectrophoresis (iDEP) and Nanopore Device
Leila Rezaei1, Ankit Rana1, and Leyla Esfandiari1
1University of Cincinnati, Cincinnati, OH

TH-45 Superparamagnetic Magnetite Nanocrystal Clusters Enable Sensitive Biomarker Detection
Linlin Zhang1, Sheng Tong1, Qingbo Zhang2, Vicki Colvin2, and Gang Bai1
1Rice University, Houston, TX, 2Brown University, Providence, RI

TH-46 Sequence-Specific Electrical Purification of Nucleic Acids with Nanoporous Gold Electrodes
Pulgo Deggum1, Sandra Appelt1, Zimple Matharu1, Marco Marco1, and Erkin Iseri1
1University of California, Davis, CA

TH-47 Optimizing Magnetic Fluid Heating by Tuning the Magnetic Relaxation through Ordered Clustering
Sheng Tong1, Qingbo Zhang2, Vicki Colvin2, and Gang Bai1
1Rice University, Houston, TX, 2Brown University, Providence, RI

TH-48 Nano Ink Materials for Four Dimensional (4D) Printing of Biomedical Scaffolds
Shiya Miao1, Haisu Cui1, Margaret Noskov1, Se Jin Lee1, Xuan Zhou1, Wei Zhu1, and Liang Zhang1
1Georgia Washington University, Washington, DC

TH-49 Automated SERS-based Malaria DNA Detection: A Prototype
Shuya Rayer1, Hoang Ng1, and Tuan Vo-Dinh1
1Duke University, Durham, NC

Track: Respiratory Bioengineering
Bioengineering Approaches to Lung Development, Regeneration, Repair and Replacement

TH-50 An Improved Double-Chamber Bioreactor for De-epithelialization and Re-epithelialization of Tracheal Scaffolds
Haniyu Le1, Ali Matinmanesh2, Masoud Gavai1, Rina Verna1, Gohar Karoubi2, David Romero1, Amiy Baziyak1, Thomas K. Waddell1, and Cristina Amon1
1University of Toronto, Toronto, ON, Canada

TH-51 Micro-CT Study of Mouse Lung Vasculature: A Foundation for Modelling Lung De- and Recellularization
Michael G. Georgiev1, Takaya Suzuki1, Eric Chadwick1, Golnaz Karoubi2, David Romero1, Amiy Baziyak1, Thomas K. Waddell1, and Cristina Amon1
1University of Toronto, Toronto, ON, Canada, 2University Health Network, Toronto, ON, Canada

Thursday, October 12 | 9:30 am–5:00 pm | Exhibit Hall 300 North
Poster Viewing with Authors & Refreshment Break | 9:30 am–10:15 am and 3:00 pm–3:45 pm
Poster Session—Thursday
September 12–14, 2017 | Phoenix | BMES2017
Thursday, October 12 | 9:30 am–5:00 pm | Exhibit Hall 300 North
Poster Viewing with Authors & Refreshment Break | 9:30 am–10:15 am and 3:00 pm–3:45 pm

TH-52
Nanoparticles Derived from Lung Extracellular Matrix Induce Epithelial Cell Proliferation and Pre-regenerative Macrophage Phenotype
Patrick Lue1, Vinelle Cenman1, Alessandra Brisini1, and Rebecca Heiss1
Virginia Commonwealth University, Richmond, VA

TH-53
Bioengineered Lung Scaffolds to Repair PAH-induced Lung Damage
Snehal Nath1
Texas Tech Health Sciences Center, Amarillo, TX

TH-54
Multifunctional Properties of Pentagalloyl Glucose Polyphenol—A Possible Pathway For Emphysema Treatment
Vasileak Pavaraseanu1, Vasim Nosoulizi1, and Naren Vyawahare1
Chalmers University, Gothenburg, Sweden

Tracks: Translational Biomedical Engineering, Tissue Engineering
Tissue/Organoid Biofabrication (*ABioM SIG)

TH-55
Growing Vascularized Tissues In Vitro with an Autonomous Tissue Cartridge
John Morgan1 and Jason Spector1
Cornell University Medical College, New York, NY

TH-56
Hypoxic 3D Cellular Network Construction Preserves Ex vivo the Phenotype of Primary Human Osteocytes
Saba Choudhury1, Qieying Sun1, Ciaran Mannion1, Yar Kasiri1, Jenny Zilberberg1, and Juan Jose Arriaga1
Stem Cell and Organoids Center, Weizmann Institute of Science, Rehovot, Israel

Track: Biomechanics
Biofluid Mechanics

TH-57
Two-Photon Excitation Based Velocimeter for Blood Flow Measurement with Ultrahigh Spatial Resolution
Audrey Wang1 and Guen Woen1
University of South Carolina, Columbia, SC

TH-58
Effects of Physiology on Blood Rheology
Jeffrey Horner1, Antony Beris1, Norman Wagner1, and Donna Woulfe1
University of Delaware, Newark, DE

Track: Biomaterials
Biomaterials for Imunoengineering

TH-60
Design of Degradable PEG Hydrgens To Deliver CCL21 and β Cell Autoantigens to Induce Peripheral Tolerance in Type 1 Diabetes
Aaron Stock1, Stephen Bell1, and Alison Time1
University of Miami, Miami, FL

TH-61
Direct Irradiation Synthesis of Titanium Alloys to Develop Immunomodulatory Implants for Hard Tissue Applications
Aletha Barnett1, Ana Cunato2, Sandra Arena1, Aksel Thrify1, and Jean-Paul Allain1
University of Illinois Urbana Champaign, Urbana, IL

TH-62
A Helical Capping System for Controlling the Aspect Ratios of Peptide Nanofibers
Chelsea Fies1 and Joel H. Cullen1
Duke University, Durham, NC

TH-63
CD200-coated PLGA Nanoparticles Inhibit Macrophage Activation
Esther Chen1 and Wendy Liu1
University of California, Irvine, Irvine, CA

TH-64
A Combined Carrier-Adjuvant System of Peptide Nanofibers and Toll-like Receptor Agonists Potentiates Robust CD8+ T Cell Responses
Jia-Ru1, Guangjun1, and Guo-Zhu Shin1
University of Texas Medical Branch, Galveston, TX

TH-65
Mechanochemical Regulation of Macrophage Inflammatory Activation by Fibrinogen
Jessica Y. Hsieh1,2, Yoon Kyung Kim1,2, and Wendy F. Liu1,2
University of California, Irvine, Citrus, CA

TH-66
Utilizing Magnetic Iron Oxide Nanoparticles for Tracking Activated T Cells In Vivo
Rocio Vizcaino1,2 and Carme Gimenez1
Rose University, Houston, TX

TH-67
Peptide Amphiphile Vaccine for Cocaine Addiction
Tara Clover1, Aida G. Walker1, and Jai S. Rudra1
University of Texas Rio Grande Valley, Brownsville, TX

TH-68
Inhibitor Loaded Micelles for Suppression of MPS Clearance of Therapeutic Nanocarriers
Trevor Stack1 and Evan Scott1
Northwestern University, Evanston, IL

Track: Biomaterials
Biomaterials for Regenerative Medicine

TH-69
Directed Irradiation Synthesis on Porous Titanium for Enhanced Biocompatibility
Almahfar Shetty1, Ana Cunato2, Sandara Arvai3, and Jean Paul Allain1
University of Illinois Urbana Champaign, Urbana, IL

TH-70
Bioreactor Conditioning of Tissue-Engineered Vascular Grafts for Diabetic Patients
Anna Carter1, James Choe1, and Agneta Simoescu1
Clemson University, Clemson, SC

TH-71
A Study of Porous Polycaprolactone (PCL) Scaffolds with Different Porogen Amount and Size Ranges for Bone Tissue Engineering
Carolina Leynes1, Marco A. Annigare1, and Sue Anne Chua1
University of Texas Rio Grande Valley, Brownsville, TX

TH-72
Novel Healing Strategy for Chronic Wounds
Heather Binbird1, Sarah Grace Dennis1,2, Grant Kahley1, Stephen Fann1, and Michael You1
Medical University of SC, Charleston, SC

TH-73
Cytocompatibility Evaluation of Injectable Bone Substitutes of Carrageenan and Nano Hydroxyapatite
Jazmín González1,2, Claudia Ossa2, and Thomas Webster1
Northeastern University, Boston, MA, 2University of Antioquia, Medellin, Colombia

TH-74
Biocompatible Ferromagnetic Polyurethane Nanofibers for Tissue Engineering
Ashok Williams1, Rachel Dass1, and Kristen Mills1
Rensselaer Polytechnic Institute, Troy, NY

TH-75
Elucidating the Antibacterial Functionality of a Novel Zn-bioactive Glass In Craniofacial Applications
Alethia Barnwell1, Ana Civantos Fernandez1, Sandra Arias1, and Jean Paul Allain2
University of Illinois Urbana Champaign, Urbana, IL

TH-76
The Antibacterial Potential of an Ag-Containing Bone Void Filler
Kapil Raghuraman1, Emily Krull1, and Aisling Coughlan1
University of Toledo, Toledo, OH

TH-77
Crosslinkable Amine Coating of Poly(L-lactic acid) for Bone Tissue Engineering Scaffolds
Nathan Reichburg1, Cortez Williams1, and Vassilios Sikaras1
University of Oklahoma, Norman, OK

TH-78
Effects of Polymerized Hemoglobin on Macrophage Response
Paulina Kryszewski1, Kiran Patel1, Christopher Richardson1, Rene Schlos1, Martin Yarmush1, and Andre Palmer2
Rensselaer Polytechnic Institute, Troy, NY

TH-79
The Accelerating Effect of Gallium-Containing Mesosporous Bioactive Glass On The Platelet Activation
Arias Phayothom2, Esha Samaranayake1, Nahidul Adib Kachi1, and Mark R. Towler1,2
University of Malaysia, Kuala Lumpur, Malaysia; 1University of Toronto, Toronto, ON, Canada

TH-80
Injectable Thermostressive and Biodegradable Hydrogels for Stem Cell Based Dental Tissue Engineering
Sri Chandana Reddy Damari1 and Tao L. Lowe1
University of Tennessee Health Science Center, Memphis, TN

Track: Biomaterials
Biomaterials Scaffolds

TH-81
In Vivo Regenerative Potential of Soft Polymeric Scaffolds in Osteochondral TMJ Defects
Adam Chlo1, Juan Taboada1,2, Ign Gea3, and Alejandro Almarza1
University of Pittsburgh, Pittsburgh, PA

TH-82
Electrospinning of Hybrid Scaffolds to Mitigate the Tumor Microenvironment
Ashok Williams1, Rachel Dass1, and Kristen Mills1
Rensselaer Polytechnic Institute, Troy, NY

TH-83
A Comparison between Cortical and Spinal Cord Astrocyte Response to Electrosurgical Topography
Desan Paul1, Anthony O'Driscoll1, Christopher Johnson1, Amanda Vespermann1, and Ryan Gilbert1
Rensselaer Polytechnic Institute, Troy, NY

TH-84
Poly (1, 8-Octanediol Citrate)/Bioglass Scaffolds for Osteogenic Differentiation of Stem Cells
Ehsan Zeinama1, Sara Pourshahrestani1, Nazianh Adib Kachi1, and Mark R. Towler1,2,3
University of Malaysia, Kuala Lumpur, Malaysia, 1University of Ottawa, Ottawa, ON, Canada

1University of Delaware, Newark, DE
2Virginia Commonwealth University, Richmond, VA
3Medical Center, Hackensack, NJ
1Medical University of SC, Charleston, SC
1University of Illinois Urbana Champaign, Urbana, IL
1Cornell University Medical College, New York, NY
1The University of Toledo, Toledo, OH
1Mayo Clinic, Rochester, MN
1The University of Toledo, Toledo, OH
1Northwestern University, Evanston, IL
1University of Texas Medical Branch, Galveston, TX
1University of Texas Rio Grande Valley, Brownsville, TX
1University of Oklahoma, Norman, OK
1The University of Toledo, Toledo, OH
1Rensselaer Polytechnic Institute, Troy, NY
1The University of Toledo, Toledo, OH
1University of Texas Rio Grande Valley, Brownsville, TX
1Rice University, Houston, TX
1University of Illinois at Urbana Champaign, Urbana, IL
1University of Antioquia, Medellin, Colombia
1Northeastern University, Boston, MA, 2University of Antioquia, Medellin, Colombia
1University of California, Irvine, Irvine, CA
1Duke University, Durham, NC
1University of California, Irvine, Irvine, CA
1University of Texas Medical Branch, Galveston, TX
1University of California, Irvine, Irvine, CA
1University of California, Irvine, Irvine, CA
Thursday, October 12 | 9:30 am–5:00 pm | Exhibit Hall 300 North

Tracks: Cellular and Molecular Bioengineering, Biomechanics

TH-159 Studying the Effect of Fibroblast Growth Factor 23 on Neutrophil Chemotaxis using Microfluidic Devices

TH-160 A Dual-Docking Microfluidic Device for Studying Immune Cell Migration and Chemotaxis

TH-161 Fiber Stiffness Influences Cell Migration into Dense Fibronectin

TH-162 The Role of Neutrophil-Endothelial Interactions in Neutrophil Extravasation and Migration using Organotypic Microvessels

TH-163 Cell Division Induces and Switches Coherent Angular Motion Within Bounded Cellular Collectives

TH-164 Electrochemotactic Stimulation to Enhance Retinal Progenitor Cell Migration and Integration into Damaged Retinas

TH-165 Characterization of Ca2+ Oscillations in Endothelial Cells Exposed to Pulsatile vs. Oscillatory Flow

TH-166 Tunable Molecular Tension Sensors Reveal Extension-Based Control of Vinculin Loading

TH-167 Measurement of Nuclear Force and Deformation in MDCK Cells Under Biaxial Stress

TH-168 In Vitro Evaluation of Hydrostatic Pressure on ATP Release and Purinergic Regulated Caspase-1 Activation in Rat Urinary Cells

TH-169 The Role of Nuclear Lamins A/C in Nuclear Mechanotransduction

TH-170 YAP-mediated Stretch Mechanotransduction in Controlling MSCI Adiopogenesis

TH-171 In Silico Analyses of Protein Function in Osteocytic Cells Exposed to Fluid Flow

TH-172 Simulated Microgravity Decreases LINC Complex Expression in MSCs

TH-173 Site-specific E-cadherin Mutations Affect Gastric Cancer Cell Tensional Homeostasis

TH-174 The Role of Age in Shear-Induced Platelet Activation: Comparison of Neonatal Cord and Adult Platelets

TH-175 Determination of Magnetic Bead Pulling Forces Using Traction Force Microscopy

TH-176 Spatial Patterning of Epithelial-Mesenchymal Transition is Regulated by Fibronectin Fibrillogenesis

TH-177 3D Traction Generation Measured from Neutrophils Confined to Micropatterned Stripes

TH-178 Biomechanics of Axonal Microtubules under Various Loading Conditions

TH-179 Evaluation of the Role of Cross-Links on Microtubule Mechanics Using a Corotational Finite Element Simulation

TH-180 Traction Force Microscopy Using Embedded Marker Arrays with an Implied Zero-Displacement State

TH-181 Quantifying Forces Required to Rupture the Nuclear Membrane
TH-213 Hyaluronic Acid-based Hydrogels to Investigate Effects of Microenvironment on Glioblastoma Invasion
Alizee Sbahi1, Yaelin Ghochoi1, Wei Xie1, Kunihiro Hanai1, Stephanie Schild1
University of California, Los Angeles (UCLA), Los Angeles, CA

TH-214 A Stiff Microenvironment Promotes Failure of Midbody Abscission and Multinucleation Downstream of DMT Initiators
Allison K. Simi1, Akiha A. Anlas1, Sherry Y. Zhang1, Tiffany Ho1, Derek C. Reddy1, and Celeste M. Nelson1
Princeton University, Princeton, NJ; 1Mayo Clinic Cancer Center, Jacksonville, FL

TH-215 Lymph Node Mimetic for Investigating Cancer Metastasis
Amr Hassanein Hakimabadi1, Ashrafi Nia1, Jan Teung Hee1, and Lijian Tang1
The University of Texas at Arlington, Arlington, TX; 1The University of Texas Southern Methodist University, Dallas, TX

TH-216 Tumor Derived Exosomes Polarize Macrophages
Allison K. Simi1, Alisya A. Anlas1, Sherry X. Zhang1, Tiffaney Hsia1, Derek C. Reddy1, and Celeste M. Nelson1
1Virginia Tech, Blacksburg, VA

TH-217 Assessing the Individual Impacts of Stiffness and Fiber Density on Breast Cancer Invasion using a Gelatin-methacrylate/Collagen Crosslinking Network
Anthony Berger1, Kelsey Lyonsmeier1, Pamela Kweege1, and Kristyn Mastern1
University of Wisconsin-Madison, Madison, WI

TH-218 Evaluation of Extracellular Matrix Requirements in Tumor Drug Resistance
Charles Byrnes1 and Matthew Burris1
Louisiana State University, Walker, LA

TH-219 Identifying Altered Intercellular Signaling Networks in Cancer: Wnt-inducible Signaling Pathway 1 Protein (WISP1) as an Illustrative Example
David Enkel1, West Virginia University, Morgantown, WV

TH-220 Liposome Diffusion and Mechanical Stiffness in Cancer Spheroids
Devina Jassal1, Armin Rad1, Amanda Lori1, Mu-Ping Nieh1, Kevin Galley1, and Kazunori Hoshino1
1University of Connecticut, Storrs, CT; 1University of Connecticut Health Center, Farmington, CT

TH-221 Influence of Fibroblasts on Metastatic Cancer Drug Resistance in a 3D Microfluidic Cell Array
Elizabeth C. Benoy1, Chun-Wai Chi1, A.H. Rezawunuddin Ahmed1, Chengyi Li1, and Shang Wang1
1City University of New York-City College, New York, NY

TH-222 Recapitulating Metabolic Heterogeneity at the Tumor-Stroma/Interface In Vitro
Hydi-Maxima Begum1, Gabriel Rocha1, Kristen Nemek1, and Kayse Shriver1
1Department of Biomedical Engineering, University of Southern California, Los Angeles, CA; 1Department of Stem Cell Biology and Regenerative Medicine, University of Southern California, Los Angeles, CA; 1Norris Comprehensive Cancer Center, University of Southern California, Los Angeles, CA

TH-223 Engineering 3D In Vitro Models of Small Cell Lung Cancer using ECM-based Hydrogels
Jianfeng Li1, Xing Jie1, Jing Hu1, Shan Yang1, Julian Sage1, and Fan Yang1
1Stanford University, Stanford, CA

TH-224 Pulsed Electric Fields Preferentially Target Therapy-Resistant Gliona Cells
Ji Li1, Karine Fournier1, Eduard Lesot1, Zhong Sheng1, Rafael Davallo1, and Scott Verbridge1
1Virginia TechWake Forest University, Blacksburg, VA; 1Virginia TechCarlson Research Institute, Roanoke, VA

TH-225 Heterogeneous Tumor Invasiveness is Influenced by Radiation-Induced Changes to the Extracellular Matrix
Marjan Rafai1, Nenna Rosen1, Hassun Shehadeh1, Katrina Wisdom1, Janine Eri1, Amato Giaccia1, and Edward Greaves1
1Stanford University, Stanford, CA; 1University of Copenhagen, Copenhagen, Denmark

TH-226 Heparin-based Hydrogel as a 3D Matrix for Solid-phase Growth Factor Presentation and Cultivation of Human Breast Cancer Cells
Nobu Menon1 and Caroline N. Jones1
1Virginia Tech, Blacksburg, VA

TH-227 3-D Microtechnology-based Platform for Cultivating Viruses Infected Cancer Cells
Rami El Assal1, Franceline Julien1, Alessandro Tocchio1, Thuy-Phuong Chinh1, Chantal Bauzac-Hamelin1, Kenneth M. Kay1, and Ulf-Damitz1
1Stuttgart University School of Medicine, Palo Alto, CA; 1Harvard Medical School, Boston, MA

TH-228 Electroporin 3D Poly(e-caprolactone) Scaffolds For Osteosarcoma Behavior Modeling
Tejas Solanki1, Eric Molina1, Brian Mansy1, Salah El-edine Lhammedi-Cherad1, Joseph Ludwig1, and Antonios Mikos1
1Rice University, Houston, TX; 1University of Texas M.D. Anderson Cancer Center, Houston, TX

TH-229 The Breast Simulacrum: A 3D Biometric Model of the Tumor Microenvironment and Metabolism
Yoshiko Toida1, John Morgan1, Julia Jin1, Jaime Bernstein1, and Jason Spector1
1Weill Cornell Medical College, New York, NY; 1Nancy E. and Peter C. Mench School of Biomedical Engineering, Cornell University, Ithaca, NY

TH-230 Substratum Stiffness and Cancer Cell Dormancy
Ariana Aria1 and Celeste Nelson1
1Princeton University, Princeton, NJ

TH-231 High-Frequency Irreversible Electroperoration Selectively Kills Tumor-Initiating Cells in Ovarian Cancer
Andrea Rolando1, Eva Schmelke1, and Rafael Davallo1
1Virginia Tech, Blacksburg, VA

TH-232 Platelet Decays: Novel Cellular Therapeutic Approach to Target the Metastatic Cascade
Ileana Pirozzi1, Adam Snider1, and Anubhav Tripathi1
1The Ohio State University, Columbus, OH; 1The University of Alabama, Tuscaloosa, AL

TH-233 Alterations in Adhesion: Critical Step in Developing Chemoresistant Ovarian Cancer
Deepak Gosh1, Carolina Maya Paena1, and Michelle Dawson1
1Tulane University, New Orleans, LA

TH-234 Ethanol and HIFU Revert Prostate Cancer Cells to a Healthy Phenotype via ROS Production and HIF B Blockage
Emma Bortz1, Heng Yu1, Hakim Murad1, and Damir Khmbashali1
1Tulane University, New Orleans, LA

TH-235 Extracellular 1/2-driven Sprouty2 Expression Mediates Resistance to Receptor Tyrosine Kinase Inhibitors in Glioblastoma
Evan Day1 and Matthew Lazzer1
1University of Virginia, Charlottesville, VA; 1University of Pennsylvania, Philadelphia, PA

TH-236 Molecular Mechanisms of Emergent Drug Resistance of Colon Cancer Cells in 3D Tumor Models
Pradip Shahi Thakuri1, Gary Luker2, and Hossein Tavara1
1The University of Akron, Akron, OH; 1University of Michigan, Ann Arbor, MI

TH-237 The Immunological Microenvironment of a Synthetic Pre-Metastatic Niche That Captures Early Metastatic Cells
Robert Oakes1, Shreyas Rain1, Grace Bushnell1, Joseph Decker1, Yining Zhang1, Matthew Hall1, Rachel Dudake1, Jacqueline Jerusal1, and Lonneke Shoe1
1University of Michigan, Ann Arbor, MI; 1The University of Alabama, Tuscaloosa, AL

Track: Cancer Technologies

TH-238 Microfluidic Cancer Models

TH-239 A Microfluidic Device for Controlled Cell Placement and 1D Migration on Biomimetic Structures
Colin Hiney1, Dhane Mitevelova-Inbar1, Miguel Martinez-Calderon1, Sergio Araos1, Matej Majkic1, Santiago Olazar1, and Derek Hansford1
1The Ohio State University, Columbus, OH; 1CEIT-IK4 & Tecnun, Donostia, Spain

TH-240 Real Time Analysis of the Role of Pericellular Matrix in Metastatic Invasion and Invasion of Breast Cancer Epithelial Cells within a Microfluidic Platform
Marie-Diana Breit1, Heather Bilgen-Bilgen1, Gerasimos Daskal1, Matthew Price1, James McCarthy1, and David Wood1
1University of Minnesota, Minneapolis, MN

TH-241 Examining The Three-Dimensional Breast Tumor Microenvironment
Matthew Rogers1, Tammy Szabo1, David Schaffer1, Phil Samson1, Andrew Johnson1, Phil Owen1, John Wikswo1, and Amato Giaccia1
1SpBcredible Searle Undergraduate Research Program, Nashville, TN; 1Vanderbilt Institute of Integrative Biosystems Research and Education, Nashville, TN; 1Vanderbilt University School of Medicine, Nashville, TN; 1Vanderbilt University, Nashville, TN; 1U.S. Department of Veterans Affairs, Nashville, TN; 1Department of Veterans Affairs, Nashville, TN
TH-367 Preliminary Clinical Assessment of Growth Potential of Mitral Valves Fabricated from Porcine Small-Intestinal Submucosa
Brittany Gonzales1, Omkant Markande1, Shayan Rameswamy1, Lazaro Hernandez1, Lilian Valdes-Cruz1, Steven Bibeikis1, Frank Scholl1, Ivan Bent2, and Sarah Ball1
Florida International University, Miami, FL, 1Joe D'Maggio Children's Hospital, Memorial Regional Hospital, Hollywood, FL

TH-368 Rapid Manufacturing of Regenerative Heart Valve Replacements
Francesco S. Passaquindici1, Andrew Capulli1, Maximilian Y. Emmert1, Luca Cera1, Max Queener1, John Ferrin1, Simon F. Hoornstra1, and Kevin Kit Parker1
Harvard University, Cambridge, MA, 1University of Zürich, Zürich, Switzerland

TH-369 Tissue-engineered Atherosclerosis Model in a Physiological Bioreactor
Jun Chen1, Grant Alexander1, Cheewai Bui1, Chunisong Zhang1, Young-Sup You1, Britta Breit1, Palanappan Senth1, Jeonga Kim1, and Ho-Wook Jun1
University of Alabama at Birmingham, Birmingham, AL, 1Emory University, Atlanta, GA

TH-370 Peptide-Modified Hyaluronic Acid Microrods Deliver Mechanochemical and Biochemical Cues for Cardiac Repair Following MI
Long Li1, Quni Fang1, Rich Siewen1, Randall Lea1, and Tad Desai1
University of California, San Francisco, San Francisco, CA, 1University of California, Berkeley, Berkeley, CA

TH-371 In Vitro Assessment of Heart Valve Tissue Engineering Scaffold Inflammatory Potential
Michael Veigle1, Nicole Grogan1, Marca Char1, Richard Hopkin1, and Joe D’Sa1
Children’s Mercy Hospital, Kansas City, MO, 1University of Kansas, Lawrence, KS

TH-372 Compliance-Induced Intimal Hyperplasia using an Ex Vivo Articular Cartilage System
Patricia Diaz Rodriguez1, Tafroor1, Juan Diaz Quintero1, Víctor Guas-Anguillar1, Alysha Kitchen1, Allison Post1, Elizabeth Coughlin Henderson1, and Manish Hahn1
Department of biomedical engineering, Rensselaer Polytechnic Institute, Troy, NY, 1Department of Biomedical Engineering, Texas A&M University, College Station, TX

TH-373 Assembly of IPS-derived Cardiomyocytes and Endothelial Cells into Perfusable Muscle Tissue
Rachel Hatano1, Greg Girardi1, and Kara McCluskey1
University of California, San Francisco, San Francisco, CA

TH-374 Tissue-engineering of iPSC-Derived Brain-Specific Microvessels
Raleigh M. Livolit1, Morah E. Kari1, and Peter C. Pearson1
Johns Hopkins University, Baltimore, MD

TH-375 Ischemic Myocardial Calcification by Annexin Gene Silencing
Shu Liu1 and Yu Wu1
Northwestern University, Evanston, IL

TH-376 Optogenetic Systematic Stimulation of the Autonomic Nervous System to the Heart In Vitro
Tara Tonesgor1, Abigail Kopper2, and Ryan Kopper2
Northeastern University, Boston, MA

TH-377 Biophysical Creep Conditioning of Engineered Human iPS-derived Cardiac Tissue
Travis Wallace1 and Karen Czolij1
Brown University, Providence, RI

TH-378 Maturing Sarcomeric Protein Expression and Contract Kinetics of Engineered Heart Tissue Through Angiotensin II and Electrical Pacing.
Vik Ramachandran1, Christina Lee2, Martin Galloway2, and Henk Granzier2
University of Arizona, Tucson, AZ

TH-379 Novel System for Pre-clinical Testing: Microfluidic Organotypic Culture of Human Cardiac Slices
Yun Guan1, Qiwen Ding1, Yang Li1, Christian Missale1, Zheny Li1, and Igor Elmas1
The George Washington University, Washington, DC

TH-380 Solving Engineered Tissue Necrosis with Growth Factor-Induced Microvasculature
Zhenhao Xu1 and Max Li1
College of Engineering, Wayne State University, Detroit, MI

Tracks: Tissue Engineering, Biomechanics

TH-381 Mechanobiology in Cell and Tissue Engineering

TH-382 Recaptulating the Placental Microenvironment to Enhance Trophoblast Fusion and Barrier Function
Blakey Bussie OConnor1, Francesco Passaquindici1, Luke MacQueener1, John Zinnmann1, and Kevin Kit Parker1
Harvard University, Cambridge, MA

TH-383 A Microfluidic System to Relate Cancer Cell Matrix Invasion to Exosome Mechanobiology
Ruby H. HUGH1, Abigail Chandler1, and Christopher B. Reis1
The Catholic University of America, Washington, DC

TH-384 Visualizing Human Induced Pluripotent Stem Cell-derived Cardiomyocyte Cytoskeletal Remodeling and Force Generation in Tunable Single Cell Platform
Alison Schroer1, Kristina Koskoe1, Arjun Adhikari1, Kathleen Ruppel1, James Spaulding1, and Beth Pruit1
Stanford University, Stanford, CA

TH-385 Integrating 4-D Light-Sheet Imaging and Computational Fluid Dynamics to Elucidate the Effects of Biomechanical Forces on Valvular Development in the Outflow Tract
Jeffrey Hsu1, Junjie Chen1, Zhe Jia1, Virgil Veluth1, Ilyan Lee1, Yichen Ding1, Alison Marden2, and Tsung Hsieh1
UC San Francisco, CA, 1Stanford University, Stanford, CA

TH-386 Computational Approaches to Understanding Single Cell Structure-Function Relationships
Mitchell Martinez1, Gary Dean1, and Delphine Dean1
Clemson University, Clemson, SC

Track: Cellular and Molecular Bioengineering

TH-387 The Role of Vinculin in Long-Range Propagation of Mechanosensitive Signaling in Cell Layers
Evan Gater1, Iban Goldstein1, and Brenton Hoffman1
University of Virginia, Charlottesville, VA

TH-388 Exosomes from Diabetic SMCs Induce Adhesion of Monocytes to Vascular Endothelium
John Selby1, 2University of California San Diego, San Diego, CA, 1UCLA, 2Scripps Clinic and Research Foundation, La Jolla, CA

TH-389 Cytoplasmic Regulation of Integrin-Mediated Signal Transmission
Hamidreh Sharif1, Saeid Mohammadi1, B. E. Metha1
University of California, Berkeley, Berkeley, CA

TH-390 Role of Vimentin in Mesenchymal Stem Cell Area Changes in Response to Environmental Cues
Posnam Sharma1, Diane R Wagner1, and Adam H Heish1
1University of Mary Washington, Fredericksburg, VA, 2University of Virginia, Charlottesville, VA

TH-391 Force-Transmission in Nasal Adhesions with Associations of Talin, Vinculin and Paxillin
Sangyoon Han1, Alexia Barch1, Kevin Dean1, Edgar Gutierrez1, Alex Grossman1, Alan Horsky1, and Gaudelene Davaris1
University of Texas Southwestern Medical Center, Dallas, TX, 1University of Virginia, Charlottesville, VA, 2University of California San Diego, San Diego, CA, 3Allen Institute for Cell Science, Seattle, WA

TH-392 Integrated Traction Force Microscopy and Magnetic Tweezers to Study Blister Formation in Pemphigus Vulgaris and Bullous Pemphigoid
Wade McMillan1, Antion Kruger1, Edward Sanders1, and John Selby1
1University of Iowa, Iowa City, IA, 2Iowa City VA Health Care System, Iowa City, IA

Track: Stem Cell Engineering

TH-393 Cytoskeletal Development in Differentiating Embryonic Stem Cells
Lina Alvarado1 and Toby Ayers1
1Tufts University, New Orleans, LA

TH-394 Physical Confinement Alters Cytoskeletal Requirements for Mesenchymal Stem Cell Migration
Mary Dozlin1 and Kimberly Smirko1
1University of Maryland, College Park, MD

TH-395 Adipocyte Maturation and Nuclear Reorganization
Parisa Rabban1, Caleb Lieberman1, Bo Chen1, and Michael Chodosh1
1University of Texas at Arlington, Arlington, TX

TH-396 Mesenchymal Differentiation of Endothelial Progenitor Cells using Cyclic Strain
Prachanth Kovvali1, M. A. Alejandro Sublot1, Raj B Rao1, and Kerthi Balachandran1
1University of Arkansas, Fayetteville, AR

TH-397 Nanotopography-dependent Promotion of Human Mesenchymal Stem Cell Osteogenesis
Wen Qian1, Jang Gong1, Jiayi Cai1, Ziyang Zhang1, and Weiqiang Chen1
1New York University, New York, NY
Thursday, October 12 | 9:30 am–5:00 pm | Exhibit Hall 300 North

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

Track: Cellular and Molecular Bioengineering
Mechanobiology of the Vascular and Nervous Systems

TH-398
Triglyceride Rich Lipoprotein Composition and Metabolism Modulate Endothelial Inflammatory Phenotype
Antis Rahman1, Andrea Fernandes1, John Newman1, Scott Simon1, and Anthony Passerini1

University of California, Davis, CA

TH-399
In Vivo Axons of Motor Neurons Exhibit Circumferential Contractility
Anthony Fan1, Alireza Tofangchi1, Mikhail Randal1, Gabriel Popescu1, and Taher Sali1

University of Illinois at Urbana-Champaign, Urbana, IL

TH-400
Flow-induced HDAC1 Phosphorylation and Nuclear Export in Angiogenic Sprouting
Despina Bazou1, Ma Risa Ng2, Jonathan Song3, Shan Min Chiu1, Nir Maor3, and Larcia Munt1

Massachusetts General Hospital, Boston, MA; Harvard Medical School, Boston, MA

TH-401
Exploring the Mechanical Properties of von Willebrand Factor
Whitney Lai1, Wengang Cao1, Yi Wang1, Frank Zhang1, and Xuanhong Cheng1
Lethbridge University, Lethbridge, PA

Track: Respiratory Bioengineering, Biomechanics
Mechanics of the Respiratory System

TH-402
Experimental Results: Asymmetric Flow in Symmetric Branched Structures
Adam Sensenbarg1, Ascario Arzangui1, and Bela Suki1

Baylor College of Medicine, Houston, TX; Universidade Federal do Ceara, Fortaleza, Brazil

TH-403
Cell Injury Patterns in Airway Bifurcations Suggest an Alternative Mechanism of Plasma Membrane Disruption and Cell Detachment During Airway Reopening
Christopher Han1, John P. Canavan2, and Penny Adams3

1The Ohio State University, Columbus, OH; 2The Ohio State University Wexner Medical Center, Columbus, OH

TH-404
Computational Modelling of Cough and Mucus Clearance in Patients with Total Laryngectomy
Don Naidon Kunpunthupala1

University of Central Florida, Orlando, FL

TH-405
Lung Tissue Mechanics: Role of Pleural Cavity Shape on Tissue Deformation
Hamed Minaeezam1, Haribalan Kumar1, Meryn H. Tawhai1, and Aly R. Clark1

1Auckland Bioengineering Institute, University of Auckland, Auckland, New Zealand

TH-406
Effects of Aging and Stretch Pattern on the Actin Cytoskeleton of Lung Fibroblasts
Elizabeth Bartelski1, and Bela Suki1
Boston University, Boston, MA

Track: Bioinformatics, Computational and Systems Biology
Metabolic Models

TH-407
Mapping Pancreatic Cancer Metabolism to Investigate Optimal Therapeutic Strategies: Insight from 13C Labeling
Malin Roy1, Katherine Machado1, Daniel Brass1, Heather Christofi1, and Sharry Finley1

1Biomedical Engineering, University of Southern California, Los Angeles, CA; 2Biological Chemistry Department and UCLM Metabolism Center at the David Geffen School of Medicine, University of California Los Angeles, Los Angeles, CA; 3UCSF Metabolism Center at the David Geffen School of Medicine, University of California Los Angeles, Los Angeles, CA. Biological Engineering and Chemical Engineering & Materials Science, University of Southern California, Los Angeles, CA

TH-408
Functional Significance of NOS-dependent Nitrite in Staphylococcal Respiration
Mohammad Islam1, Suja Chaudhari1, Vinu Chithratham Thomas1, and Rajib Saha1

1University of Nebraska-Lincoln, Lincoln, NE, University of Nebraska Medical Center, Omaha, NE

TH-409
Pharm Cat: A Physiologic-based Pharmacokinetic (P4PK) Model to Study Virtual Drug Dosing in Cats
Renee Lake1, Jessica Quimby2, and Brad Reisfeld1

1University of Nebraska-Lincoln, Lincoln, NE; 2University of California, Riverside, Mission Viejo, CA

TH-410
Computation-Driven Understanding of the Cellular Cost and Regulation of Melanin Production
Whitney Schrader1, Jyothi Kumar1, Rajib Saha1, and Steve Harris1

1University of Nebraska-Lincoln, Lincoln, NE

TH-411
Sorting Cells by their Density
Nazia Norma1, Heran C. Bhat1, and William H. Grover1

1University of California, Riverside, Mission Viejo, CA; 2University of California, Riverside, Riverside, CA

TH-412
Paper-based Vertical Flow Microfluidic Immunoassay for Diagnosis of Melioidosis
Peng Chen1, Jun Gu2, Marcelline Hollingsworth3, Sujeta Pandit4, Arnav Pati4, Douglas Mignogna4, David Aucoc5, and Frederic Zentzuan5

1University of Arizona, Phoenix, AZ; 2University of Nevada, Reno, NV; 3Arizona State University, Tempe, AZ

TH-413
Graphene Oxide-Based Microfluidic Cortisol Sensor with Enhanced Sensitivity
Shou Shuo Poudyal1, Kyung Eun You1, and Hyeon Joong Yoon1

South Dakota State University, Brookings, SD

TH-414
Multiple Myeloma Cell Drug Responses Differ in Thermals vs. PDMS Microfluidic Devices
Thomas Moser1 and Edmond Young1

1University of Toronto, Toronto, ON, Canada

TH-415
Enrichment in a Microfluidic Thermal Gradient Device
Thomas Moser1, Zhou Cao1, and Xuanhong Cheng1

Lehigh University, Bethlehem, PA

Tracks: Cancer Technologies, Nano and Micro Technologies
Microscale Cancer Cell Analysis

TH-416
Luminescent Nanoparticles for High-throughput Microfluidic Droplet Barcoding
Huang-Chiao Huang1, Joyce Liu1, and Hyeun Joong Yoon1

1Lehigh University, Bethlehem, PA

TH-417
Novel Bioconductive Piezoelectric Microsensor for Cancer and Soft Tissue Treatment Monitoring
Nicolae Stoicescu1, Lucian Grucean2, and Gabriel Grusan1

1The National Institute for Laser, Plasma & Radiation Physics (INFLP); 2Bucharest, Romania; 3ISC Medinfo SRL, Craiova, Romania, 4American Medical School and Massachusetts General Hospital, Boston, MA

TH-418
The Vital Role of Nuclei in the Cell Passing Through Small Restrictions and Size Based Filtration
Yeqi Xu1 and Si-Yang Zhang1

1Penn State University, University Park, PA

TH-419
Evaluating Binding Events of Cancer Cell Surfaceome
Fahad Alshemmary1, Gisela Durmaz1, Muharem Pnosic1, Khalil Gupta1, and Ulkan Darmoor1

1Stanford University, Palo Alto, CA

TH-420
High Throughput Single Cell Analysis of Peptide Uptake and Deubiquitinating Enzyme Activity Using a Microfluidic Droplet Trapipg Array
Nora Safabakhsh1, Marjanabadi Vahdatnajad1, Saboajin Cherar1, Riad El-Hankouzi2, Wayne III Wortmann3, Adam Melvin4, and Nora Safabakhsh1

1Louisiana State University, Baton Rouge, LA, 2Louisiana State University, Baton Rouge, LA

Track: Cancer Technologies
Precision Medicine and Biomarkers in Cancer

TH-421
Primary Patient Tumor Organoids for Personalized Drug Treatment
Andrea Mazocco1, Konstantinos Votanopoulos1, Shay Sofer1, and Aleksandr Startsev1

1Wake Forest Institute for Regenerative Medicine, Winston-Salem, NC; 2Comprehensive Cancer Center at Wake Forest Baptist Hospital, Winston-Salem, NC

TH-422
Repurposing of Minocycline Potentiates Irinotecan Efficacy Against Peritoneal Carcinomatosis
Huang-Chiao Huang1, Joyce Liu1, Yao Baglo1, Siream Anbil1, and Xuanhong Cheng1

1University of Alabama at Birmingham, Birmingham, AL

TH-423
Development of Pancreatic Neuroendocrine Tumor Therapy Based on Specific Surface Receptors
Jacqui Oli1, Ziad Abdunab mieszka1, Samuel Jang1, Ningxin Yu1, Kalyong Goh1, Herbert Chen1, Renata Jasikul Gutu1, and Xuanhong Cheng1

1The University of Alabama at Birmingham, Birmingham, AL

TH-424
Direct Quantification of Deubiquitinating Enzyme Activity in Intact Cells Using a Protein-Resistant, Cell Permeable Peptide-based Reporter
Nora Safabakhsh1, Jacob Pettigrew1, Gavin Pappas1, Ted Gauthier2, and Adam Melvin2

1Louisiana State University, Baton Rouge, LA, 2Louisiana State University, Baton Rouge, LA

TH-425
Offactory Receptor Gene Expression Is Correlated with Breast Cancer Progression
Shirin Masjedi1, Laurence Zwiebel1, and Todd Giorgio1

1Louisiana State University, Baton Rouge, LA

TH-426
Improving Cancer Diagnostics with a Novel Protein Energetics Model
Zachary Fintz1, Lawrence Williams1, and Martin Yamash1

1Rutgers University, New Brunswick, NJ; 2University of Arizona, Phoenix, AZ

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

BMES 2017 | Phoenix | BMES 2017 | Phoenix
TH-427
Simulations of Surfactant Replacement Therapy in Large Mammal Models
Alireza Kazemi1, Bruno Louis2, Daniel Isabey2, Marcel Flöschl2, and James Gottfried2
1Ecole Polytechnique, Palaiseau, France, 2INSERM, Créteil, France, 3University of Michigan, Ann Arbor, MI
TH-428
Computational Assessment of Airflow Sensitivity to Healthy and Diseased Lung Conditions
Bora Sul1, Zachary Opptiz2, Shehan Jayasekera3, Brian Vanger3, Amy Zeller4, Michael Morris4, Kar Ruppert1, Talissa Altes4, Vinnet Badea1, Steven Day1, Rita Robinson2, Jaques Reiffman2, and Anders Wallender2
1DoBiotechnology High Performance Computing Software Applications Institute, US Army Medical Research and Materiel Command, Fort Detrick, MD, 2Mechanical Engineering Department, Rochester Institute of Technology, Rochester, NY, 3Department of Medicine, San Antonio Military Medical Center, Fort Sam Houston, TX, 4Radiology Department, University of Pennsylvania, Philadelphia, PA, 5Department of Radiology, University of Missouri, Columbia, MO
TH-429
Multi-Objective Optimization of Multi-Frequency Oscillatory Ventilation
Jacob Herrmann1,2, Marlyn Taswell1, and David Kaczka1
1University of Iowa, Iowa City, IA, 2University of Auckland, Auckland, New Zealand
TH-430
A Computationally Tractable Model of Alveolar/Alveolar Airway Interactions in the Entire Lung
Jason Ryan1, Laura Krasovec1, Hideki Fujioka1, Dave Halpern2, and Jacob Herrmann1
1University of Iowa, Iowa City, IA, 2Wexner Medical Center, Columbus, OH
TH-431
Modeling of Inhalation and Bi-directional Airflow Effects on Oscillatory Ventilation
Rochester Institute of Technology, Rochester, NY, 3Department of Command, Fort Detrick, MD, 2Mechanical Engineering Department, Applications Institute, US Army Medical Research and Materiel Medicine, San Antonio Military Medical Center, Fort Sam Houston, TX, 5University of Otago, Dunedin, New Zealand, 2University of Auckland, Auckland, New Zealand
TH-432
Modeling the Frequency Response of a Proportional Solenoid Valve for Oscillatory Ventilation
Bakir Hadjian1, Jacob Herrmann1, and David Kaczka1
1University of Iowa, Iowa City, IA
TH-433
Using Alveolar Pneumocyte Self-Derived Exosomes to Modulate Lung Inflammatory Response
Christopher Cheong1, Natalie Huguet-Castro1, Chris Bobba1, and Samir Ghadiali1,2
1The Ohio State University, Columbus, OH, 2The Ohio State University Wexner Medical Center, Columbus, OH
TH-434
Modeling the Fate of a Chemotherapeutic Agent Following Direct Injection into a Lung Tumor
Jason H.T. Bates1 and C. Matthew Kinsey1
1University of Vermont, Burlington, VT
TH-435
Predicting Risk of Death from Lung Cancer as a Function of Age and Smoking History
Katharine L. Hamlington1, C. Matthew Kinsey1, and Jason H.T. Bates1
1University of Vermont, Burlington, VT
TH-436
Predicting Radiation Risk From a Structure of Pneumocytes-2-oxidase for an Improved Electron Transfer: A Smart Design for Enzymatic Electrodes
Catherine Coady1, Tereza Ivanova1, Shuashen Hui1, Dmitri Tolkatchev1, So He1, and Alla Kostyukova1
1Washington State University, Pullman, WA, 2Department of Biomedical Engineering, Texas A&M University, College Station, TX
TH-437
Device for Preventing Rodent Wound Split Removal
Sibylle Van Hove1, Laith Hermez2, Vinod Suresh1, and Daniel Gallego-Perez1
1The University of Auckland, Auckland, New Zealand, 2Fisher & Paykel Healthcare, Auckland, New Zealand, 3Auckland Biocentre, Auckland, New Zealand
TH-438
Translational Biomedical Engineering
Challenges and Opportunities in Drug Delivery to Targeted Tumor Vessels
Claire Repellin1, Puja Patel1, Lidia Sambucetti1, and Parijat Bhatnagar1,2
1Kansai University, Suita, Japan, 2The Ohio State University, Columbus, OH
TH-439
Modeling Radiation Sensitivity of Gold Reduction by Maltose Binding Protein
Amar Thaker1, Karthik Pushpavanam1, Kaushal Rege1, and Thomas Barker1
1Virginia Tech, Blacksburg, VA, 2Virginia Tech Carilion Research Institute, Roanoke, VA
TH-440
Modeling Foreign Body Response to Ventricular Catheters in the Treatment of Hydrocephaus by Masking Shunts with Monolayers of Ciliated Epithelial Cells
Carolyn Harris1 and Prashant Harharan1
1Wayne State University, Detroit, MI
TH-441
Rationally Designed 2-Dimensional Paper Networks (2DPNs) for Point-of-Care Diagnostics
Kristin Byers1, Laura Jamieson1, Anna Bird1, and Jacqueline Linnen1
1Purdue University, West Lafayette, IN
TH-442
Time Dependent Modifications of Intestinal Glucose Utilization Mediated by Roux-en-Y Gastric Bypass Surgery
M. Alessandro1, Adam Akkad2, Vasily Belov1, Janine Appleton1, Mikhail Papavo2, Martin Yamul2, Ober Yilmaz2, and James Grotberg3
1Center for Engineering in Medicine, Harvard Medical School, Massachusetts General Hospital, Boston, MA, 2Massachusetts Institute of Technology, Koch Institute for Integrative Cancer Research, Boston, MA
TH-443
Assessing Driver Mental State through Physiological Measurements Using Simulator
Nanjing, China, People’s Republic of, 3Shihezi University, Shihezi, China, 4People’s Republic of China
TH-444
Modeling the Fate of a Chemotherapeutic Agent Following Direct Infection into a Lung Tumor
Jason H.T. Bates1 and C. Matthew Kinsey1
1University of Vermont, Burlington, VT
TH-445
Modeling the Frequency Response of a Proportional Solenoid Valve for Oscillatory Ventilation
Bakir Hadjian1, Jacob Herrmann1, and David Kaczka1
1University of Iowa, Iowa City, IA
TH-446
Using Alveolar Pneumocyte Self-Derived Exosomes to Modulate Lung Inflammatory Response
Christopher Cheong1, Natalie Huguet-Castro1, Chris Bobba1, and Samir Ghadiali1,2
1The Ohio State University, Columbus, OH, 2The Ohio State University Wexner Medical Center, Columbus, OH
TH-447
Modeling the Fate of a Chemotherapeutic Agent Following Direct Infection into a Lung Tumor
Jason H.T. Bates1 and C. Matthew Kinsey1
1University of Vermont, Burlington, VT
TH-448
Microfluidic Devices with Integrated Microvalves for High-Throughput Replicative Lifespan Studies
Michael Roblet1, Nathaniel H. Thayer1, Ben Cooper1, Rob Kaye1, Dan E. Gottfried2, and R. Scott McIsaac1
1Calico Labs, South San Francisco, CA
TH-449
High Throughput Perfusion Platform for Characterization of Endothelial Toxicity
Nicole Ravennetz1, Theresa Bou-Akl2, and Yvesen Li1
1Lawrence Technological University, Southfield, MI, 2Ariadne-St. John Providence, Southfield, MI
TH-450
Electrical and Cell Adhesive Behavior of Polyvinylamine-Chloride and Chitosan Nanocomposites
Sara Abu1, John Appal2, and Anthony Guiseppe-Elia1,2
1Center for Engineering in Medicine, Harvard Medical School, Massachusetts Institute of Technology, Koch Institute for Integrative Cancer Research, Boston, MA
TH-451
Monitoring Women’s Fertility Through Volatile Biomarkers
Sara Abu1, John Appal2, and Anthony Guiseppe-Elia1,2
1Center for Engineering in Medicine, Harvard Medical School, Massachusetts Institute of Technology, Koch Institute for Integrative Cancer Research, Boston, MA
TH-452
Identifying Volatile Hormone Signatures for Monitoring Female Reproductive Health
Chi Nguyen1, Samantha Brown1, Jarrett Estime1, and Barbara Smith1
1Arizona State University, Tempe, AZ
TH-453
Functional Evaluation of Cell Aggregation Inducing Peptide for 3D Culture
Yoshiki Hirono1, Yuki Yamamoto1, and Sachiko Kakinoki1
Kansai University, Suita, Japan
TH-454
A Novel Permanent Anti-Inflammatory Molecular Coating on Silicone Implants Significantly Reduces Peri-Prosthetic Capsule Formation
Alexandra L1, Sarah Kajino1, Ozim Vase1, Jamie Bernstein3, Julia Mc1, Omer Tishbi1, Kavita1, Andrea Abadie1, Kerry Morris4, Rachel Akintoy1, Robert Langer2, Daniel Anderson2, and Richard Spector1
1Laboratory for Bioengineering Medicine & Surgery, Well Cornell Medical College, New York, NY, 2Sylvania Inc., Cambridge, MA, 3Massachusetts Institute of Technology, Cambridge, MA
TH-455
Engineering T Cells into Disease-Directed Protein Biofactories
Claire Repellin1, Pujit Patel2, Lida Sambuceti1, and Parajit Bhathate2
1SRI International, Menlo Park, CA, 2Stanford University, Stanford, CA
TH-520
A Chronically Implantable System for Drug Delivery to Deep Brain Microstructures
Khaliq Ramadass\(^1,2\), Kevin Spencer\(^3\), Canan Dogdeviren\(^2\), Pauline Joe\(^1\), Carline Nonet Lopez\(^1\), Ann M. Graybiel\(^1,3\), Robert Langer\(^1,2\), and Michael Cima\(^1\)
\(^1\)Massachusetts Institute of Technology, Cambridge, MA; \(^2\)Koch Institute for Integrative Cancer Research, Cambridge, MA; \(^3\)McGovern Institute for Brain Research, Cambridge, MA

TH-521
Multiresolution Acoustic Simulation of Transcranial Focused Ultrasound (FUS)
Kuang-Hao Yoon\(^1\), Philip Cioffi\(^1\), Ryan Margolin\(^1\), Wonhye Lee\(^1\), and Seung-Sik Koo\(^1\)
\(^1\)Emory University, Atlanta, GA, \(^2\)San Jose State University, San Jose, CA

TH-522
Experience Dependent Plasticity of Cortical Attention States
Purva Rayi\(^1\) and Matthew Coleman\(^1\)
\(^1\)The George Washington University, Washington, DC

TH-523
Spontaneous and Evoked Activity from Murine Motor Neurons Cultured on Microelectrode Arrays
Rahul R. Atmaramani\(^1\), Bryan J. Black\(^1\), Isabella Reed\(^1\), Ellie Chen\(^1\), and Joseph J. Pancrazio\(^1\)
\(^1\)University of Texas at Dallas, Richardson, TX

TH-524
Three Dimensional Reconstruction of Vibrissal (Whisker) Follicle Morphology Across the Rat Mystacial Pad
Chris S. Buxton\(^1\) and Mitra J.Z. Hartmann\(^1\)
\(^1\)Northwestern University, Evanston, IL

TH-525
Development of a Functional, Multiscale Tapered Fiber as a Biomorphic of a Rodent Vibrissa
David W. Collinson\(^1\), L. Catherine Branson\(^1\), and Mitra J.Z. Hartmann\(^1\)
\(^1\)Northwestern University, Evanston, IL

TH-526
Human Jaw-Tongue Reflex Evoked by High Frequency Mandibular Vibrations
Ferhat Erdogan\(^1\), Binlin Li\(^1\), and Mostafa Motavalli\(^1\)
\(^1\)University of Connecticut, Storrs, CT

TH-527
Electric Field Sensors in Mouse Home-Cage Detect Activity and Respiration Changes After Nerve Injury
Heide Kleefstra\(^1\), Alejandro Lopez\(^1\), Bill Gosby\(^1\), Michael Sawchuck\(^1\), Mallika Halder\(^1\), and Shawn Hochman\(^1\)
\(^1\)Emory University, Atlanta, GA; \(^2\)San Jose State University, San Jose, CA

TH-528
Effects of Ankle Perturbations During Electrical Stimulation on Gait Cadence
Kaley Nishimura\(^1\) and Seung-Jae Kim\(^2\)
\(^1\)California Baptist University, Riverside, CA

TH-529
Quantification of the Natural Tactile Surface Using a Three Dimensional Dynamic Model of the Rat Vibrissal System
Nadine Zweifel\(^1\), Ian Graham\(^1\), Todd D. Murphy\(^1\), and Mitra J.Z. Hartmann\(^1\)
\(^1\)Northwestern University, Evanston, IL

TH-530
Locomotor Adaptation on Visual Feedback Distortion and Split-belt Treadmill
Fonanu Chibunda\(^1\), Seung-Jae Kim\(^2\), and Hyung Lee\(^1\)
\(^1\)Arizona State University, Tempe, AZ; \(^2\)California Baptist University, Riverside, CA

Track: Neural Engineering
Neural Engineering—Other/Non-Specified

TH-531
Use of Machine Learning Algorithms in Electroencephalography based Brain-Computer Interfaces
Jacob Salyers\(^1\) and Yan Gu\(^1\)
\(^1\)Saint Louis University, St. Louis, MO

TH-532
Peripheral Nerve Regeneration via Optical Stimulation
David Vera\(^1\), Zoe Horton\(^1\), Audrey Lee\(^1\), Ryan Koppes\(^1\), and Abigail Koppes\(^1\)
\(^1\)Northwestern University, Boston, MA

TH-533
Spatiotemporal Growth Factor Release for Enhanced Peripheral Nerve Regeneration
Elizabeth May\(^1\) and Henrik Sundaranagrahan\(^1\)
\(^1\)Wayne State University, Detroit, MI

TH-534
Neurostimulator Signal Generator with Tunable Waveforms
Jose Aquiles Parodi Amaya\(^1\) and Jin-Woo Choi\(^1\)
\(^1\)Louisiana State University, Baton Rouge, LA

TH-535
Efficient Stimulus Artifact Removal to Allow Single-unit Recordings from Fast-conducting A-fibers
Longtu Chen\(^1\), Monty Escabi\(^1\), and Bin Feng\(^1\)
\(^1\)University of Connecticut, Storrs, CT

Track: Stem Cell Engineering, Bioinformatics, Computational and Systems Biology
Stem Cell Systems Biology & Bioinformatics

TH-536
Neuromodulation of Peripheral Nerve Excitability Using Ultrasound
Sonchi Chatterji\(^1\) and Bruce Taylor\(^1\)
\(^1\)University of State University, Tempe, AZ

TH-537
Electrically Conductive Composite Hydrogel Embedded with Functionalized Carbon Nanotubes for Nerve Regeneration
Xilong Lu\(^1\), Joseph Kim\(^2\), Wei Wu\(^3\), Alan Miller\(^1\), and Lichun Lu\(^1\)
\(^1\)Mayo Clinic, Rochester, MN

Tracks: Stem Cell Engineering, Bioinformatics, Computational and Systems Biology
Stem Cell Systems Biology & Bioinformatics

TH-538
Construction of a Data-Model to Identify Conflicting Signaling Axes Governing Myoblast Cell-Fate Responses to Diverse Ligands
Alexander Lobstein\(^1\), Sharon Baumgarten-Goud\(^1\), Debashrita Bhattarcharya\(^1\), Ruth Kopyto\(^1\), Joseph Kim\(^1\), and Benjamin Campion\(^1\)
\(^1\)Cornell University, Ithaca, NY

TH-539
Molecular Mechanisms of In Vitro Myogenic Differentiation of hiPSCs
Priya Nayak\(^1\), Shankar Subramaniam\(^1\), and Shyni Varghese\(^1\)
\(^1\)UCSD, La Jolla, CA

TH-540
Developmental Pathways Pervade Stem Cell Differentiation of Embryonic Stem Cells Mediated by Stromal Cell Signaling
Ramila Joshi\(^1\), James Buchanan\(^1\), Jun Li\(^2\), and Hossein Tavana\(^1\)
\(^1\)The University of Akron, Akron, OH, \(^2\)Kent State University, Kent, OH

TH-541
Differentiation of Mesenchymal Stem Cells in Tissue Engineering
Sreekumar Moorthy\(^1\), Shaw Ho Woon\(^1\), and Lim Soon Hoong\(^1\)
\(^1\)Arizona State University, Tempe, AZ, \(^2\)National University of Singapore, Singapore

TH-542
Designing an Artificial Pancreas
Mo Ebrahimkhani\(^1,2\)
\(^1\)Wayne State University, Detroit, MI, \(^2\)Lawrence Technological University, Southfield, MI, \(^3\)Brigham Young University, Provo, UT

TH-543
Peptide-Modified Hyaluronic Acid Hydrogels Promote Oligodendrocyte-Lineage Differentiation
Christopher Christopher\(^1\), Jesse Liang\(^1\), Joshua Karam\(^1\), Rebecca Biemann\(^1\), and Stephanie Saeidi\(^1\)
\(^1\)UCLA, Los Angeles, CA

TH-544
Role of Cross-talk between PDGF and tgf-β1 in Signaling in Controlling Mesenchymal Stem Cell Migration
Desiree Ghishli\(^1\) and Michelle Dawson\(^1\)
\(^1\)Brown University, Providence, RI

TH-545
Delivery and In Situ Differentiation of MSCs to the Trabecular Meshwork During Glaucoma
Eric Snider\(^1\), Yingli Lin\(^1\), Zaraen Zarei\(^1\), Richard Kim\(^1\), Kelsey Reed\(^1\), and L. Ross Ethier\(^1\)
\(^1\)Georgia Tech and Emory University, Atlanta, GA

TH-546
Alginic Encapsulated Mesenchymal Stromal Cells for Osteoarthritic Treatment
Leann-Marie Barchard\(^1\), Sarah E. Sahn\(^1\), Supriya S. Santpaul\(^1\), Rene S. Schloss\(^1\), and Martin L. Yarmush\(^1\)
\(^1\)Rutgers, the State University of New Jersey, Piscataway, NJ

TH-547
Microfluidic Selection of Mesenchymal Stromal Cell Subpopulations During Culture Expansion Extends the Chondrogenic Potential In Vitro
Lu Yin\(^1\), Yinggan Wu\(^2\), Ching An Fea\(^1\), Winnie Demavin\(^1\), Zheing Zhang\(^1\), Cheew Teck Lim\(^1\), Eng Hin Lee\(^1\), and Jiongqiao Han\(^1\)
\(^1\)Singapore-MIT alliance for Research and Technological Center, Singapore, Singapore, \(^2\)National University of Singapore, Singapore, Singapore, \(^3\)Massachusetts Institute of Technology, Cambridge, MA

TH-548
Developmental Pathways Pervade Stem Cell Responses to Evolving Extracellular Matrices
Ramila Joshi\(^1\), James Buchanan\(^1\), Jun Li\(^2\), and Hossein Tavana\(^1\)
\(^1\)The University of Akron, Akron, OH, \(^2\)Kent State University, Kent, OH

TH-549
Self-Regulation of Neural Differentiation of Embryonic Stem Cells Mediated by Stromal Cell Signaling
Ramila Joshi\(^1\), James Buchanan\(^1\), Jun Li\(^2\), and Hossein Tavana\(^1\)
\(^1\)The University of Akron, Akron, OH; \(^2\)Kent State University, Kent, OH

TH-550
Glucose Metabolism during Chondrogenesis of Human Mesenchymal Stem Cells
Yi Zhong\(^1\), William Pontius\(^1\), Mostafa Motawal\(^1\), Arnold Caplan\(^1\), Jean Walker\(^1\), and Harshika Baskaran\(^1\)
\(^1\)Case Western Reserve University, Cleveland, OH
**TH-551**
PO2-regulated Red Blood Cell Mechanics
Modulates Capillary Blood Flow in the Brain
Jaeok Wan1 and Sang Son Ju1
1RIT, Rochester, NY

**TH-552**
Multi-Joint Somatosensory Assessment in Patients Post Stroke
Li-Qun Zhang1,2, Dal Xu1,2, Yingpeng Ren1,2, Song Hoon Kang2, and Yunji Lee1
1University of Maryland, Baltimore, MD, 2Northwestern University, Evanston, IL

**TH-553**
Nitrile Oxide Releasing Biomaterial Coating for Brain Aneurysm Coils to Improve Healing
Patrick Hwang1, Magda Collier1, Grant Alexander1, Brigitte Broit2, Robert Hergenrother3, Ramanathan Kadirvel3, David Salmons1, and Ho-Wook Jun1
1Endomimetics LLC, Birmingham, AL, 2University of Alabama at Birmingham, Birmingham, AL, 3NorthShore Hospital, Evanston, IL

**TH-554**
Thrombin Generation Kinetics on Oxidized Polystyrene Surfaces
Yanyao Wang1, Zhan Wang1, and Jinshi Tian1,2
1Virginia Commonwealth University, Richmond, VA, 2Virginia Commonwealth University, Richmond, VA

**TH-555**
Cracks in Basement Membrane-like Soft Substrate Trigger Epithelial Dissociation Without Mechanotransduction
Christopher Walter1, Joshua Davis2, and Amit Pathak3
1Washington University in St. Louis, St. Louis, MO

**TH-560**
Physical Confinement of Cells Induces Compression of the Focal Adhesion Protein Vinculin
Kathryn Rothenberg1, Andrew LaCroix1, Shane Neibart1, and Patrick Hwang1
1RIT, Rochester, NY

**TH-561**
Disrupted Surfaces of Porous Membranes Reduce YAP Nuclear Localization in Adipose-Derived Stem Cells
Stephanie Caskil1, Ana Perez2, Spencer Perry1, Hong Herzog1, and Thomas Gabor1
1Rochester Institute of Technology, Rochester, NY, 2Northwestern University, Evanston, IL

**TH-562**
Solid Surface Tension Directs Cellular Behaviors through Integrin-based Mechanotransduction
Zhi Cheng1, Carolyn Shurer1, Chung Yuan Hui1, and Matthew Pasic2
1Cornell University, Ithaca, NY

**TH-563**
The Cytotoxicity of Silica Nanoparticles on A549 Human Epithelial Cells under Biaxial Mechanical Stretch
Hamid Ghasaiazad1 and Shyam Aramuthan1
1NC A&T State University, Greensboro, NC

**TH-564**
Effects of Tumor-Relevant Substrate Mechanics on Primary Pancratic Cancer Cells
Janny Porecek1, Wismen Farah1, Andres Rubiano2, and Chelsy Simmans1
1University of Florida, Gainesville, FL

**TH-565**
Size Effect on Random Motion of Colloidal Particles near a Substrate
Jaeon Hyun1, Jeongho Kay1, Sangsoo Lee1, and Seiyung Lee1
1Korea University, Wonju, Korea, Republic of, 2Korea University, Wonju, Korea, Republic of

**TH-566**
System for the Application of Hydrostatic Pressure and Mechanical Stress to a Flexible Cell-Seeded Substrate
Justin Bacasa1, Jim Inagaito1, and Codi Dunton1
1Clemson University, Clemson, SC

**TH-567**
NF2 Haploinsufficient Fibroblasts are Less Mechanically Sensitive than NF1 Haploinsufficient Fibroblasts or Healthy Fibroblasts
Rufenig Ma1, Ralf Klemmke1,2, Dietrich Kaufmann1,2, and Kristan L. Mills2
1Bennetzen Polycarbonate Institute, Troy, NY, 2Rensselaer Polytechnic Institute, Troy, NY, 3Reutlingen University, Reutlingen, Germany

**TH-568**
Force Driving Metastatic-like Dispersion and Malignant Transformation in Epithelial Monolayers
Sulin Zhang1, Yao Zhang2, Xuechen Shi1, and Tiankai Zhao2
1Penn State University, University Park, PA, 2Northwestern University, Evanston, IL

**TH-573**
Development of a Novel RNA-Dependent Method for Tuning Gene Circuit Dynamics
Qi Zhang1, Seng Yuan1, and Xiao Wang2
1Arizona State University, Tempe, AZ

**TH-574**
A Novel Bio-chemo-mechanical Model of Tissue-engineered Vascular Graft Dynamics
Ramak Khosravi1, Jason Szafron1, Cameron Beest1, James Reinhardt1, Ying Ung Lee1,2,3, David Mehta1,4, Toshiharu Shinoka2,3, Senior Cross1, and Jay Humphery1
1Yale University, New Haven, CT, 2Nationwide Children's Hospital, Columbus, OH

**TH-575**
Allotrophic Effect of ε-Actinin Binding on Vinculin Activation
Hengameh Shams1 and Mohammad R. K. Mofrad2
1University of California, Berkeley, Berkeley, CA

**TH-576**
Characterization of Cellular Behaviors Towards Cancer Progression Under Compression
Kenneth Keun Yin1, Yu-En Huang1,5, Katherine Shao1, and Allen Liu1
1University of California, Irvine, CA, 2Dartmouth College, Hanover, NH, 3Wellesley College, Wellesley, MA, 4University of Massachusetts, Amherst, MA

**TH-577**
Shear Force On Hutchinson - Giford Progerin Cells Causes Nuclear Rupture And Cell Death
KrantiHar Bathula1, Lindsay Lefratta1, and Daniel Conway1
1Virginia Commonwealth University, Richmond, VA

**TH-578**
Nuclear Stress Dependent DNA Damage and Repair Factors Mis-localization after Lamin-A Depletion
Yuanuo Xie1, Jerome Iarossi1, Charlotte Pfeifer1, Lucas Smith1, and Dennis Discher1
1University of Pennsylvania, Philadelphia, PA

**TH-582**
A Multi-scale Modeling Approach to Quantifying the Effects of Brain Geometry Changes in Chronic Traumatic Encephalopathy
Ann Bakhtarian1, Allen Dobbs1, Kyle Johnson1, Mark Horsthemke2, and Rajkumar Prabhakar2
1Mississippi State University, State, MS, 2University of Alabama at Birmingham, Birmingham, Birmingham, AL

**TH-583**
Biomechanical Investigation of the Influence of Increased Femoral Anteverision on the Success of Reduction of Severe Grades of Developmental Dysplasia of the Hip with the Pavlik Harness
Blake Lozinski1,2,3, Hessel All1,2,3, Vincent Huynh1, Michael Rose1,4,5, Brendan Jones1, Eduardo Divo2,6, Faissal Modesh1, Alain Kassab1,2, and Charles Pritchard2,4,6,7
1University of Central Florida, Orlando, FL, 2Embry-Riddle Aeronautical University, Daytona Beach, FL, 3Orlando Health, Orlando, FL

**TH-584**
Analysis of Foot Pressure Data to Model Human Walking Through a Doorway
Christopher Karci1, Antonio Valdivia2, and Arthur Ritter1
1Stevens Institute of Technology, Hoboken, NJ

**Tracks:**
- **Track: Neural Engineering, Nano and Micro Technologies**
- **Track: Stroke and Neurovascular Disease and Models**

**Poster Viewing with Authors & Refreshment Break**
| Thursday, October 12 | 9:30 am–5:00 pm | Exhibit Hall 300 North | 9:30 am–10:15 am and 3:00 pm–3:45 pm |

**Tracks:**
- **Tracks: Biomechanics, Biomaterials and Tissue Engineering**
- **Tracks: Biomechanics, Biomechanics**
- **Tracks: Biomechanics, Computational and Systems Biology**
- **Tracks: Mechanical and Materials Engineering**
- **Tracks: Biomechanics, Computational and Multiscale Modeling in Biomechanics**

**Tracks:**
- **Tracks: Biomechanics, Bioinformatics, Computational and Systems Biology**
- **Tracks: Biomechanics, Computational and Multiscale Modeling in Biomechanics**
- **Tracks: Biomechanics, Computational and Multiscale Modeling in Biomechanics**
- **Tracks: Biomechanics, Computational and Multiscale Modeling in Biomechanics**
TH-585 A Phenomenological Model of the Spatio-Temporal Evolution of Embryonic Aortic Arch Microstructure
Guang Cohney, Andrew Lashkarinia1, Muhammad Jamil1, Ethan Ermek1, Selcida Gilik2, Aysep Elić3, Cana Karakyari1, Merve Calıık1, and Kerem Pakbel1
Kag University, Istanbul, Turkey

TH-586 Development of an Active Continuum Small Intestine Finite Element Model
In-seok Han1, Jin-seen Kim1, Seonoun Jung1, and Junjangee Hong1
Korea Univ., Seoul, Korea, Republic of Korea

TH-587 A Design of Trocar Valve Based on Finite Element Analysis for Improving Performance in Laparoscopic Surgery
Jae-min Kim1, Na-young Kim1, Yeungho Lee1, Songmin Jung1, Dongguk Yang1, Beomgyun Jin1, Jo-seongwo Lee1, Cheonwo Lee1, and Jinjangee Hong1
Korea University, Kyonggi, Korea, Republic of Korea

TH-588 Identifying Injury Risk Regions within Soft Tissues of Dynamic Human Body Finite Element Models
James Gaewsky1, Derek Jones1, Ashley Weaver1, and Joel Sitz1
Wake Forest University Center for Injury Biomechanics, Winston Salem, NC, USA

TH-589 A Biomechanical Investigation of the Thoracic Kyphosis following Surgical Correction with a Spinal Implant
Jayin Carter1, Timothy Michener1, and Guigen Zhang1
University of Pennsylvania, Philadelphia, PA, USA

TH-590 A Parallel Coupled Fluid Solid Modeling Tool with Palabos and LAMMPS based on the Immersed Boundary Method
Jiu Tan1, Talid Sim1, and Scott Diamond1
University of Pennsylvania, Philadelphia, PA

TH-591 Constitutive Modeling and Fluid-Structure Interactions of Venous Tissue
Niyay Kaul1, and Hoan-Ying Shuang Huang1
North Carolina State University, Raleigh, NC, USA

TH-592 Analysis of Therapeutical Characteristics of Normal and Tumoral Tissues During Hyperthermia Treatment
Saeed Tan1, Mahdieh Mohammadi1, Kasijakuma Chaurai1, Saurin Patel1, and Rajan Patel1
Clemson University, Clemson, SC, USA

TH-593 Imaging and Modelling the Motility of the Forestromach in Sheep
Stephan Wanz1, John Carter1, Garry Waghorn1, and Vincent Suresh1
University of Auckland, Auckland, New Zealand, Independent Scientist, Hamilton, New Zealand

TH-594 Multiscale Model Predicts Increasing Focal Adhesion Size with Decreasing Stiffness in Fibrous Matrices
Xue Cao1, Shan Bar1, Brendaen Baker1, Yuan Lin1, Jason Birdrick1, Christopher Chen1, and Yeqi Shenoy1
University of Pennsylvania, Philadelphia, PA, University of Michigan, Ann Arbor, MI, The University of Hong Kong, Hong Kong, Hong Kong

Tracks: Cardiovascular Engineering, Bioinformatics, Computational and Systems Biology
Computational Modeling in Cardiovascular Systems

TH-595 Database of Biophysical Parameters Of Mammalian Myocyte
André Petracci1, Jorgi Negrotto1, and Josu Pujales1, Robson Silva1, and Daniel González1
1Universidade de M报市の круиз, M报市の круиз, Brazil, 2Universidad de La Plata, La Plata, Argentina, La Plata, Argentina, California North State University, USA, California, USA

TH-596 Under-sized Mitral Annuloplasty Increases Left Ventricular Strain Regardless of Ring Type
Ashley Morgan1, Susan Patel1, Alexander Galotto1, Jonathan Weinert1, Robert Levine1, Liang Gu1, and Mark Piatli1,2
1UCSF East Bay General Surgery Research, Oakland, CA, 2UCSF General Surgery Research, Los Angeles, CA, Northern California Institute for Research and Education, CA, USA. 1Weil Cornell Medical College, New York, NY, 2Massachusetts General Hospital, Boston, MA, 3San Francisco VA Medical Center, San Francisco, CA

TH-597 Increased CaMKII-activated InA.L Alters Ion Homeostasis and CaMKII Regulation of Calcium Cycling in Atrial Cells: A Mathematical Modeling Study
Briq Omal1, Daniel Grant1, and Thomas Hund1
1The Ohio State University, Columbus, OH, USA

TH-598 Assessing the Effect of Risk Factors on Patients with Coarctation of the Aorta
Bradley Feiger1, John Gouley1, Jane Leopold2, and Amanda Randels1
Duke University, Durham, NC, 1Harvard Medical School, Boston, MA

TH-599 In Silico Evaluation of Plateau and Arterial Boundaries for Patient Specific Modeling
Christopher Noble1, Kent Carlson1, Dan Dragomir-Dan2, Amir Lerman1, and Miguel Young1
Mayo Clinic, Rochester, MN

Daniel Gratz1, Briq Omal1, and Thomas Hund1
1The Ohio State University, Columbus, OH, USA

TH-601 Predicting Downstream Wall Shear Stress Profiles in Aortas Using Simulations and Overall Morphology
Daniel Perez1, Ahmed Perez1, Austin Ferguson1, Ziyun Niu1, John Gouley1, and Amanda Randels1
1Duke University, Durham, NC, 2North Carolina School of Science and Mathematics, Durham, NC

TH-602 Simulated Impact of Ateriovenous Stenoses on Flow Dynamics in Upper Extremity Dialysis Fistulae
Danielle DeCoff1, Kevin Anthony1, Aaroun Patel1, and Joseph Tranquilla1
1Bucknell University, Lewisburg, PA, 2Geisinger Medical Center, Danville, PA

TH-603 J Wave Identification Optimization Algorithm Based on Feature Selection and PCA
Dengao Li1, Huiyang Niu1, Jumin Zhao1, Farming Wu1, and Hong Wang1
1Taiyuan University of Technology, Taiyuan, China, People’s Republic of China

TH-604 Automated Detection of J Wave using Analytic Time Frequency Flexible Wavelet Transform Applied on ECG Signals
Dengao Li1, Jumin Zhao1, Xinyan Liu1, and Yixian Liu1
1Taiyuan University of Technology, Taiyuan, China, People’s Republic of China

TH-605 An Automated J Wave Detection System Based on Feature Extraction
Dengao Li1, Jumin Zhao1, Jie Zou1, and Xinyan Liu1
1Taiyuan University of Technology, Taiyuan, China, People’s Republic of China

TH-606 Left Ventricular End Systolic Pressure Volume Relationship (ESPVR): Comparison between Real Time MRI and Conductance Catheter Measurement Methods
Dmitri Dan1, Yan Wang1, Henrik Haraldsen1, Kiyoshi Tabata1, Kimberly Spaulding1, Benjamin Raji1, Gilbert Scron1, Anusha Badathakal1, Yue Zheng1, Jing Lu1, David Saloner1, Liang Gu1, and Mark Ratchfile1
1Veterans Affairs Medical Center, San Francisco, CA, 2University of California, San Francisco, 3San Francisco Veterans Affairs Medical Center, San Francisco, CA

TH-607 Optimal Blood Flow Characteristics in a Four-way Right-atrium Bypass Connector
Elizabeth Meck1, Jiajin Jagen1, and Alexandrina Untaroiu1
1Virginia Tech, Blacksburg, VA, 2Virginia Commonwealth University, Richmond, VA, USA

TH-608 Computational Fluid Dynamics of 22 Weeks Old Human Fetal Heart with Tetralogy of Fallot
Hadis Rezepoo1, Maysam Jahangir1, Guat Lin2,3, Sarah Merchant1, Soroosh Hasani1, Ali Jafri1, Care Neefah Zain Matar1, and Choon Hee Yap1
1National University of Singapore, Singapore, Singapore

TH-609 A Closed Cardiovascular Circulation Model and Its Applications to Arteriovenous Fistulas and LVAD
Hadi Ghatshave1, Hamideh Gharahi1, Adam Willis1,2, and Seangki Ban1
Michigan State University, East Lansing, MI, University of Texas Southwestern, Dallas, TX

TH-610 Effect of Gaussian Weight Function on Element Free Galerkin Cardiac Propagation
Ian Stuart1 and Kwong Ng2
1New Mexico State University, Las Cruces, NM

TH-611 A Computational Thrombus Generation Model Applied to Aneurysms Treated with Shape Memory Polymer Foam and Metal Coils
John Toghi1,2, Jiejian Du1,2, and Duncan Mearlfield1
1Lawrence Livermore National Laboratory, Livermore, CA, 2Texas A&M University, College Station, TX, 3Kaiser PermanenteSacramento Medical Center, Sacramento, CA

TH-612 Multivariate Models for Aortic Pressure and Cardiac Output Constructed from Meta-Analysis
John Mak1, Rachel Quinn1, Marcus Ni1, Ray Prather1, Alain Kassab1, and Eduardo Divo2
1Clemson University, Clemson, SC

TH-613 Investigating the Effects of FGF12B on Nav1.5 Sodium Channel Dynamics
Kathryn Mangold1 and Jonathan Silva1
Washington University in St. Louis, St. Louis, MO

TH-614 Introducing New Criteria to Predict Aneurysm Growth
Mahsa Dabagh1, Priya Naik1, John Gouley1, David Frakes1, Rachel Guerin1, and Melissa Young1
1University of Central Florida, Orlando, FL, 2Embry-Riddle Aeronautical University, Daytona Beach, FL, 3Armal Palmer Hospital for Children, Orlando, FL

TH-615 Computational Investigation of a Self-Powered Fontinal Circulation
Roel Van Guenn1, Marcus Ni1, Ray Prather1, Alan Kassab1, Eduardo Divo2, and William DeCamp1
1University of Central Florida, Orlando, FL, 2Embry-Riddle Aeronautical University, Daytona Beach, FL, 3Armal Palmer Hospital for Children, Orlando, FL
TH-616 Multiscale Computational Fluid Dynamics Assessment of Post-LVAD Implantation to Reduce Stroke
Ray Pruthi1, Marcus N1, Alain Kawai1, Eduarda Dvora1, and William DeCamps1
University of Central Florida, Orlando, FL, 1Embry-Riddle Aeronautical University, Daytona Beach, FL, 2Orlando Health, Orlando, FL

TH-617 Model Order Reduction for Finite Difference Modeling of Cardiac Propagation
Ruxin Khan1 and Kaising Ng2
New Mexico State University, Las Cruces, NM

TH-618 Finite Difference Monodomain Modeling of Cardiac Tissue with Optimal Parameters
Ruxin Khan and Kaising Ng2
New Mexico State University, Las Cruces, NM

TH-619 A Reduced-order Model for Wall Shear Stress in Patient-specific Cerebral Aneurysms Based on Snapshot Proper Orthogonal Decomposition
Suay Han1, Clemens Schmal1, and Yehya Modarres-Sadeghi1
University of Massachusetts, Amherst, MA, 1The University of Texas at Austin, Austin, TX

TH-620 A Layered and Heterogeneous Finite Element Model for Mechanobiological Simulation of Aortic Valves
Ying Lei1 and Zannatul Ferdous1
1University of Tennessee, Knoxville, TN

Tracks: Cancer Technologies, Bioinformatics, Computational and Systems Biology
Computational Modeling of Cancer

TH-621 Tumor Cells Experience Uniformly Distributed Mechanical Cues in a 3D Bone Scaffold During Perfusion
Boyuan Liu1, Suyue Han1, Brandon Hedrick1, Yahya Modarres-Sadeghi1, and Maureen Lynch1
1University of Michigan, Ann Arbor, MI, 2University of Arizona, Tucson, AZ

TH-622 Thermo-Fluid Control for Bacterial Sociality
Denise Vura1 and Gurupriya Uppal1
1University of Notre Dame, Notre Dame, IN

TH-623 A Multi-state Population Model of Chemoresistance and Phenotypic Dynamics of Breast Cancer Cells
Grant Howard1, Kaysin Johnson1, Thomas Yankielov1, and Amy Brock1
1University of Texas at Austin, Austin, TX

TH-624 Computational-experimental Approach to Model Tumor Development as a Function of Glucose Level
Jiachen Yang1, John Virostko1, Angela Jarrett1, and Thomas Yankielov1
1University of Texas at Austin, Austin, TX

TH-625 Multi-scale Modeling of Interactions Between Deformable Cancer Cell and the Vessel Wall
Mahsa Dalbaghi1, John Gountari1, and Amanda Randles1
1Duke University, Durham, NC

TH-626 Agent-based Modeling to Predict the Effect of Electrochemotherapy on Tumors
Maryam Moarefian1 and Luke Achter1
1Virginia Polytechnic Institute and State University, Blacksburg, VA

TH-627 Physical Mechanisms of Cancer in the Transition to Metastasis
Pihua Lee1 and Charles Wolgemuth2
1University of Michigan, Ann Arbor, MI, 2University of Arizona, Tucson, AZ

TH-628 Modeling of Extracellular Matrix Degradation in a Metastatic Tumor Microenvironment Using CompCell3D
Yen Nguyen1, Anya Zornes1, and Ashlee Ford Versypt1
1University of Arizona, Tucson, AZ

Tracks: Cellular and Molecular Bioengineering, Bioinformatics, Computational and Systems Biology
Computational Modeling of Cell Motility and Proliferation

TH-629 Preliminary Validation of a Discrete Macrophage Model Using Published Experimental Results
Adam Butchy1, Cheryl Telmer2, and Natasa Miskov-Zivanov1
1University of Pittsburgh, Pittsburgh, PA, 2Carnegie Mellon, Pittsburgh, PA

TH-630 Analysis of the Spatio-Temporal Dynamics of Infection Using a Hybrid Imaris-MATLAB Platform
Danielle Stocky1 and Shibbelde May1
1University of Houston, Houston, TX

TH-631 Theory of Fluidic Control for Bacterial Sociality
Denise Vura1 and Gurupriya Uppal1
1University of Notre Dame, Notre Dame, IN

TH-632 Engineering of a Synthetic Quadrastable Gene Network to Approach Waddington Landscape and Cell Fate Determination
Feiying Wu1, Rui Su1, Ying-Cheng Lai1, and Xiao Wang1
1University of Minnesota, St. Paul, MN
2University of Notre Dame, Notre Dame, IN

TH-633 Modeling Blood Vessel Development via Co-emergence of Endothelial and Smooth Muscle Cell Patterns
Jiao Zeng1, Ayse Gopinathan1, and Karen McCluskey1
1University of California Merced, Merced, CA

TH-634 Agent-Based Computational Model of Salmonella Infection of Dendritic Cells
Lee Talmy1, Denise Monack1, and Shawn Pearce-Cottler1
1University of Virginia, Charlottesville, VA, 2Stanford University, Stanford, CA

Track: Bioinformatics, Computational and Systems Biology
Single-Cell Measurements and Models

TH-635 A Dynamical Model of Gene Expression Exposes the Regulative Power of the Nuclear Nanoenvironment
Anne Shiri1, Luay Almassalha1, Hiroaki Matsuda1, Rikkert Ngai1, Marina Cauzolino-Matsuda1, Vadim Backman2, Roger Kamm3, and Igal Sagi1
1Northwestern University, Evanston, IL, 2Northwestern University, Chicago, IL, 3Massachusetts Institute of Technology, Cambridge, MA

TH-636 A Robust scRNA-seq Data Analysis Pipeline for Measuring Gene Expression Noise
Pamela Balasubramanian1, Philippe Faucon1, and Xiao Wang1
1School of Biological and Health Systems Engineering, Arizona State University, Tempe, AZ, 2School of Computing, Informatics, and Decision Systems Engineering, Arizona State University, Tempe, AZ

TH-637 A Computational Analysis of Interactions of Oxidative Stress and Antioxidant System in Endothelial Dysfunction.
Swetai Joshi1 and Mahendra Kavdia1
1Wayne State University, Detroit, MI

TH-638 Induced Transmembrane Voltage of Stem Cells with Realistic 3D Morphologies
Suman Baddy1, Ahmed M. Haroon1, Bawang Ramapo1, Jack F. Douglas2, and Edward J. Garboczi3
1University of Missouri-Kansas City, Kansas City, MO, 2National Institute of Standards and Technology, Gaithersburg, MD, 3National Institute of Standards and Technology, Boulder, CO

TH-639 Model-Driven Design of Single-Cell Experiments
Zachary Fox1 and Brian Munsky1
1University of California, Berkeley, CA

Track: Bioinformatics, Computational and Systems Biology
Analysis of Cell Signaling

TH-640 Differences in Immune Cell Signaling Between Treatment-NAive polyJLA Patients and Matched Controls
Alfonso Tormo1 and Anthony French1
1Washington University in St. Louis, St. Louis, MO

TH-641 Computational Simulations of Iletermittent and Repeated Delivery of TRAIL Apoptosis Signal to Neutralize Tumor Cells in the Bloodstream
Emily Liederman1 and Michael King1
1Carnegie University, Irvine, CA, 2Vanderbilt University, Nashville, TN

TH-642 Inflammatory Microenvironment Alterations of Paracrine Signaling Dynamics in Antigen Presenting Cells
Joseph Desler1, Liam Casey1, and Lonnie Shal1
1University of Michigan, Ann Arbor, MI

TH-643 Multiscale Modeling of Dynamic Interactions between Calretulin and a Model Membrane Microdomain
Lingyu Wang1, Joanne Murphy-Ullrich1, Janyi Zhang1, and Yahua Song1
1The University of Alabama at Birmingham, Birmingham, AL

TH-644 The Translation Problem: Machine Learning Models of Mouse Molecular Data Predict Human Inflammatory Pathology Phenotypes
Douglas Dougal1 and Douglas Luebkenburger1
1MIT, Cambridge, MA

TH-645 Gene Regulatory Network Reconstruction of Fibroblast with Biophysical and Biochemical Cues
Hyefa Lee1, Joseph Desler1, Lonnie Shal1, and Daniel Beard1
1University of Michigan, Ann Arbor, MI

TH-646 Molecular Basis for the Link between Macular Degeneration and a Single Nucleotide Polymorphism
Reed Harrison1 and Dimitrios Morikis1
1University of Missouri-Kansas City, Kansas City, MO

Tracks: Cancer Technologies, Bioinformatics, Computational and Systems Biology
Oomics Data and Analysis

TH-647 The Translation Problem: Machine Learning Models of Mouse Molecular Data Predict Human Inflammatory Pathology Phenotypes
Douglas Dougal1 and Douglas Luebkenburger1
1MIT, Cambridge, MA

TH-648 Gene Regulatory Network Reconstruction of Fibroblast with Biophysical and Biochemical Cues
Hyefa Lee1, Joseph Desler1, Lonnie Shal1, and Daniel Beard1
1University of Michigan, Ann Arbor, MI

TH-649 Molecular Basis for the Link between Macular Degeneration and a Single Nucleotide Polymorphism
Reed Harrison1 and Dimitrios Morikis1
1University of Missouri-Kansas City, Kansas City, MO

Sriram Neelakhamma1, Kai-Cheng2, and Yuesen Zhou1
1State University of New York - Buffalo, Buffalo, NY
2University of California, Berkeley, Berkeley, CA

TH-648 Volatile Metabolites as Biomarkers for Characterizing Pyocyanin Production and Mucoidy in Pseudomonas aeruginosa

Trenton O. Davis1 and Heather D. Bean1
1Arizona State University, Tempe, AZ

TH-649 Plasmin Amino Acids in Individuals with Autism Spectrum Disorder: A Multivariate Statistical Analysis

Troy Vergato1, Daniel P. Howson1, Uwe Kruger1, James Adams2, and Juergen Hahn1
1Rensselaer Polytechnic Institute, Troy, NY, 2Arizona State University, Tempe, AZ

TH-650 A Comparison on Bio-mathematical Models for Cognitive Performance under Fatigue

Harry Peng1, Fethi Bouak1, Wenbi Wang1, Renee Chow1, and Martin Yarmush1
1Arizona State University, Tempe, AZ

TH-651 Developing a Retrieval Method for a Case-Based Reasoning System for Predicting Appearance after Breast Reconstruction

Kriska M. Nicklaus1,2, Gezheng Wen1,2, Joowon Cho1,2, Audrey Cheong1, Greg P. Reeves1, Felma A. Merchant1, Michelle C. Fingeret1,2, Scott B. Cantor2, and Mia K. Markey1,2
1University of Portland, Portland, OR, 2Arizona State University, Tempe, AZ

TH-652 An In Vitro Approach to Identify Skin Sensitizers With Feature Selection and Classification Models

Lingting Shi1, Talia Greenstein1, Serom Lee1, Rene Schloss1, and Martin Yarmush1
1Rutgers University, Piscataway, NJ

TH-653 Quality Control of mRNAs at the Entry of the Nuclear Pore Complex

Mohammad Soheilypour1 and Mohammad Mofrad1
1University of California, Berkeley, Berkeley, CA

TH-654 Gut Microbiome as Biomarker for Neuromodulation Therapy of Inflammatory Bowel Diseases

Ziyang Gan1,2
1Duke University, Durham, NC

TH-655 Processing Oscillatory Signals by Incoherent Feedforward Loops

Carolyne Zhang1, Ryan Tshokwani2, Yikun Wu1, and Lingchong You1
1Duke University, Durham, NC

TH-656 Fine Tuning of Population Ratio in a Two-strain Synthetic Microbial Consortia

Xingwen Chen1 and Xiao Wang1
1Arizona State University, Tempe, AZ

TH-657 Three-Course Sequence: An Approach to Launching Innovative Medical Devices

Andrew Jacobs1,2, Duncan McNally1, and Olivia Casido1
1University of Wisconsin–Madison, Madison, WI, 2The University of Texas MD Anderson Cancer Center, Houston, TX

TH-658 ThinkTank: A Hyperdisciplinary Approach to Team-Based Innovation

Jonathan Ehmann1, Kevin Cyp1, Katina Latsos2, Sean Bedingfield1, Alyssa Lukin1, Staci Sherrard1, Carin McIver2, and Chelsey Manasco1
1Vanderbilt University, Nashville, TN

TH-659 Initial Experience with Active Learning to Inspire The Entrepreneurial Mindset in a Junior Level Biomedical Engineering Product Design Class

Michael VanAuker1
1Arizona State University, Tempe, AZ

TH-660 A Template for Multi-Disciplinary Team-Based Problem Solving, Design, and Assessment: Application in Biomedical Engineering

Siyria Zastkla1, Scott Self1, and Glenn Gaudette2
1Saint Louis University, St Louis, MO, 2Worcester Polytechnic Institute, Worcester, MA

TH-661 Learning Catalysis: Real-time Assessment and Peer-learning in Interdisciplinary Engineering Course

Angela Jone1,2
1University of Maryland, College Park, College Park, MD

TH-662 Flipping Biomolecules for Enhanced Learning and Course Sustainability

Kevin Bunn1, Evan Phillips1, and Sherry Voskpi-Harbin1
1Purdue University, West Lafayette, IN

TH-663 Interactive Mini Online Lectures with Tutorial-based Example Videos for the Flipped Classroom

Samantha Brenna1, Michael Caplan1, and Casey Antkowi1
1Arizona State University, Tempe, AZ

TH-664 Continuous ABET Assessments Made Easier

Eileen Haeas1 and Cathy Janusk1
1Johns Hopkins University, Baltimore, MD

TH-665 Continuous Improvement in Instruction in Responsible Conduct of Research

Jula Seng1, Mia Markay1, and H. Grady Rylander2
1University of Wisconsin–Madison, Madison, WI, 2The University of Texas at Austin, Austin, TX, 3The University of Texas MD Anderson Cancer Center, Houston, TX

TH-666 Continuous Improvement in Instruction in Outcomes Assessment

Eileen Haeas1 and Cathy Janusk1
1Johns Hopkins University, Baltimore, MD

TH-667 Improvements on a Communication Intervention as a Part of a Summer Research Experiences for Undergraduates (REU) Program

Margo Cairol1, Courtney Strak1, Stephanie Young1, Laura Sugg1, Mia Markay2, and Brandi DalMonte1
1University of Texas at Austin, Austin, TX
2Arizona State University, Tempe, AZ

TH-668 A Comparison of Summative and Formative Assessments in Promoting Learning of Physiology by Biomedical Engineering Students

William Guird1 and Brian Heitkem1
1University of Virginia, Charlottesville, VA

TH-669 Research Animal Retirement Foundation

Rachael McAndrew1 and Jennifer Lingo VanGilder1
1Arizona State University, Tempe, AZ
2Arizona State University, Tempe, AZ

TH-670 Unexpected Positive Consequence of a Nationwide Program that Gives Economic Support for Low Income High Quality Students in Colombia

Vivian Talero1, Juan M Cardona1, and Juan Carlos Briceno1
1Universidad de los Andes, Bogota, Colombia

TH-671 Feedback Loops Processing Oscillatory Signals by Incoherent Feedforward Loops

Carolyne Zhang1, Ryan Tshokwani2, Yikun Wu1, and Lingchong You1
1Duke University, Durham, NC

TH-672 Out Microbiome as Biomarker for Neuromodulation Therapy of Inflammatory Bowel Diseases

Ziyang Gan1,2
1Duke University, Durham, NC
FRIDAY’S SCHEDULE HIGHLIGHTS

PLATFORM SESSIONS—FRI–1
8:00 am–9:30 am Convention Center
See pages 149–157

Special Session
8:00 am–9:30 am Room 122C
Career Options for the BME Graduate
Students and Postdoctoral Fellows

Industry Session
8:00 am–10:00 am Room 125AB
Tech Transfer Innovation Challenge

Exhibit Hall Opening
9:30 am–5:00 pm 300 Level Exhibition Hall
Poster Session
9:30 am–5:00 pm 300 Level Exhibition Hall
Poster Viewing with Authors & Refreshment Break
9:30 am–10:15 am 300 Level Exhibition Hall

Plenary Session
10:15 am–11:15 am North Ballroom BCD
Wallace H. Coulter Award for Healthcare Innovation Lecture
Bonnie Anderson

Women in BME Luncheon
11:30 am–1:00 pm West Ballroom
See page 144

Industry Session
1:00 pm–3:00 pm Room 125AB
Clinical Innovators Spotlight

Don’t forget to turn your BMES BASH ticket in for a wristband at the information or registration booths before Friday afternoon.

PLATFORM SESSIONS—FRI–2
1:15 pm–2:45 pm Convention Center
See pages 158–166

Special Session
1:15 pm–2:45 pm Room 122C
Curricular Innovation: Highlighting Your Most Unique or Innovative Course Offerings

Special Session
1:15 pm–2:45 pm Room 122A
International Symposium on Biomedical Engineering

Special Session
1:30 pm–4:30 pm Room 121ABC
BMES-NSF Special Session on Research in Biomedical Engineering and Grant Writing
Poster Viewing with Authors & Refreshment Break
2:45 pm–3:30 pm 300 Level Exhibition Hall

Industry Session
3:00 pm–5:00 pm Room 125AB
Investment Pitches and Partnering

PLATFORM SESSIONS—FRI–3
3:30 pm–5:00 pm Convention Center
See pages 167–175

Special Session
3:30 pm–5:00 pm Room 122A
BMES-NSF Special Session on Research in Biomedical Engineering and Grant Writing

Special Session
3:30 pm–5:00 pm Room 122A
Symposium in honor of Dr. and Mrs. Athanasiou

Plenary Session
5:15 pm–6:15 pm North Ballroom BCD
Diversity Award Lecture: The Danger of Acting Now
Manu Platt, PhD

BMES Dessert Bash
8:30 pm–11:00 pm Arizona Science Center

FRIDAY’S SCHEDULE HIGHLIGHTS

OP-Fri–1–1 Room 224A

Track: Biomaterials

Biomaterials for Regenerative Medicine I

Chair: Rebecca Wachs, Daniel Alje

8:00 am
Shear-induced Fibrillogenesis of Fibronectin Nanofibers for Enhanced Cutaneous Wound Healing
Christophe Chatenet1,2, Patrick Campbell3, Holly Golobic3, Adrián Bujanová1, Andrew Capulli4, Leila Deravi1,2, Stephanie Dauth1, Sean Sheedy1, Jeffrey Patent1, Karl Gladding1, Yann Doucet1,3, Eribi Alarcón1,4, Jeffrey Rubenstein1, Simon Hoareau1, Angela Christou3, and Kevin Kit Parker1
1Harvard University, Cambridge, MA, 2University of Zurich, Zurich, Switzerland, 3Purdue University, West Lafayette, IN, 4Northwestern University, Boston, MA, 5Columbia University, New York, NY

8:15 am
Engineering an Antimicrobial and Osteoinductive Hydrogel for Bone Tissue Regeneration
Ehsan Shrezaee Sam1, Sayed Hassen Baser5, Roberto Porfiri Lara1, Giuseppe Introna2, and Nasim Ashkaram3
1Northwestern University, Boston, MA, 2Harvard School of Dental Medicine, Boston, MA, 3Technological de Monterrey, Monterrey, Mexico, 4Harvard Stem Cell Institute, Cambridge, MA, 5Brigham and Women’s Hospital, Boston, MA

8:30 am
Intra-Articular TSG-6 Delivery From Heparin-based Materials Reduces Cartilage Damage In Osteoarthritis
Liame Teller1,2, Elda Trivino1,3, Nick Willett1,2,3, Robert Goldberg1,3, and Johanna Tamir1,2
1Georgia Institute of Technology, Atlanta, GA, 2Emory University, Atlanta, GA, 3Veterans Affairs Center, Atlanta, GA

8:45 am
BDNF-mimetic Peptide Amphiphile Nanostructures for Neural Regeneration
Alexandra Edelbrock1, Zaida Alvarez1,4, and Samuel Stupp1
1Northwestern University, Chicago, IL

9:00 am
Oxygen-controllable Hydrogels to Study Hypoxic, Cluster-based Vasculogenesis
Michael Blankley1, Songmian Wang1, Franklin Hall1, and Sharon Gerecht1
1Johns Hopkins University, Baltimore, MD, 2Mississippi State University, Starkville, MS

9:15 am
A Novel Sol-Gel Derived Silica/Calcium Phosphate Nanocomposite Powder for Bone Regeneration
Sayed Michael Latifi1, Otto J. Julie1, Yue Zhang1, and Henry J. Donahue1
1Department of Biomedical Engineering, Virginia Commonwealth University, Richmond, VA

*Biomaterials Track sponsored by:

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Don’t forget to turn your BMES BASH ticket in for a wristband at the information or registration booths before Friday afternoon.
8:15 am Development and Characterization of Micropatterned Cardiac Co-Cultures for Improved Tissue Engineering Strategies
Jonathan Secoy1, David Dixea Vor1, Jody Ackeryn3, Abigail Koppere1, Nashir Aminab4, and Ryan Koppan1
1Northeastern University, Boston, MA, 2Rensselaer Polytechnic Institute, Troy, NY, 3Harvard-MIT HST, Cambridge, MA

8:30 am A Dry Condition Detection Technique for Field Effect Transistor Biosensor
Yasuhiko Watani1, Anmaru Ganga1, Akid Om2, and Rashid Bashir1
1University of Illinois at Urbana-Champaign, Urbana, IL

8:45 am Bionanoparticle to Enumerate Leukocytes and CD64 Expression on Neutrophils for Sepsis Diagnosis
Umer Hassaan1, Tanmay Chonge1, Bobby Reddy3, 4, 5, 6, 7
1Enactus Valera1, 2, 3, 4, 5, 6, 7
9:00 am Capillary-Facilitated Coating of Carbon Nanotube Thin Film as a strain Gauge for Blood Retraction Test
Zida Li1, Xueling Jue1, David Peyer1, Brendan McCracken1, Kevin Ward1, and Jessica Fu1
1University of Michigan, Ann Arbor, MI

9:15 am One-step Clear Alginate Hydrogels Electro-Fabricated by Soft Nanoimprint Method
Srinivasa Sripathi1, Baranda Hansen1, Cynthia Berlinicke1, and Erin K. Wise1
1University of Maryland, College Park, MD

9:45 am Transfection of Post-Mitotic Differentiated Cells: Combinatorial Library of Polymers Enables Robust and Tunable Transcriptional Activation
Tyler Kozie1, Albert Nguyen1, Andrew Harram1, Ian Manta1, Eva Schubert1, Mathias Schubert1, and Angelica K. Parner1
1University of Nebraska-Lincoln, Lincoln, NE

8:00 am Enhanced Viral Transduction Efficiency Using Microfluidic Technology
Lakea Haug1, Vishal Tadikonda1, Brian Teear1, Jose Santos1, Dori Berlin1, Daniel Doty1, Jeffrey Bonevetski1, and Jenna Batekrestina1
1Draper, Cambridge, MA

8:30 am CRISPR-Cas9 Mediated Targeted Gene Knock-in with Long ssODN Donors
Mau Yeow1, Vanessa Lei1, and Gang Bai2
1Rice University, Houston, TX

8:45 am Chemical and Physical Priming of Human Mesenchymal Stem Cells to Enhance Nonviral Gene Delivery
Tyler Kozie1, Albert Nguyen1, Andrew Harram1, Ian Manta1, Eva Schubert1, Mathias Schubert1, and Angelica K. Parner1
1University of Nebraska-Lincoln, Lincoln, NE

9:00 am Robust and Tunable Transcriptional Activation of Native Genes by Integration of Heterologous Promoters
Michael Gimpelski1, Alexander Brown1, Nathan Tagay1, Wendy Woods1, Jackson Winter1, and Pablo Perez-Pierna1
1University of Illinois at Urbana-Champaign, Urbana, IL

9:15 am Large-Scale Design of Robust Genetic Circuits with Multiple Inputs and Outputs for Mammalian Cells
Bernhard Neiweiberg1, Hang Pham1, Leidy Caraballo1, Thomas Lozowski1, Adrian Engel1, Snaprawi Shatta1, and Wilson Wong1
1Boston University, Boston, MA, 2ETH Zurich, Basel, Switzerland

8:00 am Real Time 3D Flow Visualization
Cooper Moore1 and Olaf von Ramm1
1Duke University, Durham, NC

8:15 am Motion Assessment in the Left Ventricle Using High Speed Ultrasound Imaging
Martin Andersen1, Cooper Moore1, Samuel Schmidt1, Johannes Sinij1, and Olaf von Ramm1
1Aalborg University, Aalborg, Denmark, 2ETH Zurich, Basel, Switzerland

8:45 am A Novel Paradigm to Predict Spontaneous Preterm Birth Using the Cervical Heterogeneity Index in Ultrasound Images
Steven H. Ghorayeb1, Matthew Blitz2, Sarah Pachtman2, Megan Murphy3, Sara Rahman1, and Burton Rochelson1
1Holyoak University, Hempstead, NY, 2Northwell Health, Manhasset, NY

9:45 am Multi-functional Ultrasonic Micro- elastography Imaging System
Xuejun Qian1, Meng Ma1, Mingyu Yu1, Xiaoying Chen1, K. Kirk Shung1, and Qifa Zhou1
1University of Southern California, Los Angeles, CA

9:00 am Detecting Corneal Biomechanical Changes Using a Novel Ocular Pulse Elastography Method
Jael Pak1, Xuqian Fan2, and Jin Liu1
1Ohio State University, Columbus, OH

9:15 am Transparent Microring Ultrasonic Detector
Fabricated by Soft Nanoimprint Method
Hao Li1, Binop Dong1, Xiangchen Chen1, Zhao Zhang1, and Chong Sun1
1Northwestern University, Evanston, IL

8:00 am A Novel High-Throughput 3D Cancer Cell Migration Assay on a Microwell Chip Platform
Alexander Roh1, Stephen Hong1, Sean Yu1, Yana Sichkarev1, Oju Jeon1, Noor Janto1, Frances Jones1, Joel Asberg1, and Min-Yee Lee1
1Case Western Reserve University, Cleveland, OH, 2Case Western Reserve University, Cleveland, OH
**OP-Fri-1-16**  
**Room 226A**  
**Track: Neural Engineering**

**Peripheral Nerve Stimulation**

Chair: Tim Bruns, Kip Ludlum

**8:00 am**
Understanding Fiber Recruitment of Peripheral Nerves During Intracortical Stimulation via Computational Modeling
Erin Patrick, Kevin Ortlie, Robert Bashir, and Aysegul Gunduz
University of Florida, Gainesville, FL

**8:15 am**
Selective Stimulation of A-fibers in the Vagus Nerve by a Novel Multi-Contact Cuff Electrode
Camilo Sanchez, Andrew Wells, and Mario Romero-Ortega
University of Texas Dallas, Richardson, TX

**8:30 am**
A New Approach to Study Vagal Control of Stomach Function
Matthew Ward and Thomas Nowak
Purdue University, West Lafayette, IN, Indiana University School of Medicine, Indianapolis, IN

**8:45 am**
Neuromodulation of Gut Motility in Awake Rats Optimized by a Novel Neuromuscular Model
Bradley Barth, Craig Hernandez, Warren Giff, and Xing Shen
Duke University, Durham, NC

**9:00 am**
Peripheral Neuromodulation for Female Sexual Dysfunction
Tom Broun, Lauren Zimmerman, India Rice, Kora Dréfu, Nicole Honey, and Mitch Berger
University of Michigan, Ann Arbor, MI, and Emory University, Atlanta, GA

**9:15 am**
Acoustic Neuromodulation Enhances Peripheral Neurite Extension
Daniel Verrelli, Emily Ashbolt, Marisa Puzan, and Abigail Koppes
Northeastern University, Boston, MA

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**OP-Fri-1-17**  
**Room 226B**  
**Track: Neural Engineering**

**Deep Brain Stimulation**

Chairs: Aysegul Gunduz, Matt Johnson

**8:00 am**
Development of Wearable Focused Ultrasound Transducer for the Stimulation of Rat Brain
Ryan W. Margolis, Phillip Conos, Kyungkoo Youn, Seung-Sik Youn, and Winston Lee
Brigham and Women’s Hospital, Harvard Medical School, Boston, MA

**8:15 am**
A particle-swarm optimization algorithm for predicting deep brain stimulation settings that improve parkinsonian motor signs
Alex Doyle, Simeng Zhang, Edan Pena, Man Pen Yeats, and Matthew Johnson
University of Minnesota - Twin Cities, Minneapolis, MN

**8:30 am**
Computational study of a novel time-varying stimulation paradigm for deep brain stimulation
Daniele Tesi, Ziyi Cai, Zhouyan Feng, and Xuefeng Wei
The College of New Jersey, Ewing, NJ, and Oyvajian University, Hongzhou, China, People’s Republic of China

**8:45 am**
Towards responsive deep brain stimulation for medically refractory freezing of gait in Parkinson’s disease
Rene Molina, Jonathan Shute, Enrico Opi, Kirsten Sosnowski, Jaimie Roper, Daniel Martinez-Ramirez, Christopher Haefl, Kelly Foote, Michael Okan, and Aysegul Gunduz
University of Florida, Gainesville, FL

**9:00 am**
A real-time classifier for closed-loop sleep modulation in mice
Dillon Huffman, Farid Yaghoubi, Asma’a Al-Aawad, Hao Wang, Bruce O’Hara, Farid Yaghoubi, and Sridhar Sundaram
University of Kentucky, Lexington, KY

**9:15 am**
Closed-loop deep brain stimulation paradigm for Tourette Syndrome
Jackson Cagle, Michael Okan, Kelly Foote, and Aysegul Gunduz
University of Florida, Gainesville, FL

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**OP-Fri-1-18**  
**Room 227C**  
**Track: Biomedical Engineering**

**Education (BME)**

Chair: Eileen Haase, Jason Zara

**8:00 am**
Using calibrated peer review to track improvements in visual communication skills
Tracy Voit, Anisha Mistry, and Ann Saterbak
Rice University, Houston, TX, and Rice University, Houston, TX

**8:15 am**
Evaluating the successful implementation of Project ENGAGE: A Paid Biomedical Engineering Research Experience for African-American High School Students at Georgia Tech
Ayasha Boyce, Adeyemo Adelagbaja, Cherie Ayee, Lakesha Saranor, Lizinne Delstefano, Robert Nannen, and Edgar Pena
University of North Carolina, Greensboro, Greensboro, NC, and Georgia Institute of Technology, Atlanta, GA

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**Friday, October 13 | 8:00 am—9:30 am | Platform Session 1**

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**Friday, October 13 | 8:00 am—9:30 am | Platform Session 1**

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**8:15 am**
Assessment of a creativity-focused research experiences for undergraduates (REU) program in biomedical engineering
Megan Huffstetler, Sarah Zappe, Margaret Slattery, and Keeske Max
Penn State University, University Park, PA

**8:45 am**
Using online resources to close the gap in a sophomore biomedical engineering course
Eileen Haase and Harry Goldberg
Johns Hopkins University, Baltimore, MD

**9:00 am**
Assessing key skills in a graduate project based learning biomedical engineering course
Jeffrey La Bella, Adlin Mallon, Sarah Mcbryar, Kara Karaniuk, and Mackenzie Hite
Arizona State University, Tempe, AZ, and Mayo Clinic Arizona, Scottsdale, AZ

**9:15 am**
Demonstrations of linear systems concepts and the Fourier transform in an undergraduate course on medical imaging
Jason Zara, Camille Roberts, and Aizling Casey
The George Washington University, Washington, DC

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**SPECIAL SESSION**

**8:00 am—9:30 am**  
**Room 122C**

**Career Options for the BME Graduate Students and Postdoctoral Fellows**
Chair: Rita Alexiadou

This session aims to cater to the needs of BME PhD students and postdoctoral fellows. It brings together a panel of professionals who have PhD degrees in BME or related disciplines and are currently employed either in industry (2 speakers), academia (2 speakers), or past BME/Bioengineering Department Chairs or government (1 speaker). Each, through his/her short (10 min) presentation, will share useful tips, and their experiences, on what the BME PhD students and postdocs need to do to land the job of their dreams! A moderator will facilitate the Q&A session with the panelists both after each talk and at the end of all talks.

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**INDUSTRY SESSION**

**8:00 am—10:00 am**  
**Room 125AB**

**Tech Transfer Innovation Challenge**
Chair: Stephanie Manfield, Brooks Kushman P.C.

This session will be a forum for select researchers and academics to pitch to companies interested in sponsoring research or licensing a technology. The technology topics will align with the commercial interests of the participating companies. Company representatives will be available after the pitches for questions and networking.

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*Industry Track sponsored by:*
**OP-Fri-2**

**Room 224A**

**Track: Biomaterials**

**Biomaterials for Regenerative Medicine II**

Chairs: Atlupa Shonanan, Rene Oliveira-Nazarette

1:15 pm

**Sirt1 Transgene Delivery Improves Diabetes-Induced Wound Healing**

Yuqiao Zhu1, Michelle Jan1, Changpang Duan1, Baihua Xiao1, Alex Lorite1, Hsin-Yu Kuo1, Milan Mrksich1, and Guillermo Ameer1

Northwestern University, Evanston, IL

1:30 pm

**Electrochemical Manipulation of Living Cells Supported By Biodegradable Polymeric Nanosheets: For Cell Transplantation Therapy**

Jin Suza1, Nobuhiko Nagaz1, Masakazu Nakashima1, Toshiki Abe1, and Hirokazu Kai1

Graduate of Engineering, Tohoku University, Sendai, Japan, and Graduate of Medicine, Tohoku University, Sendai, Japan

1:45 pm

**Sliding Hydrogels with Tunable Molecular Mobility and Degradation Enhance and Accelerate Neocartilage Formation by Osteochondral Cells in 3D**

Xuming Tong1 and Fan Yang1

Stanford University, Stanford, CA

2:00 pm

**Sustained Release of Bioactive VEGF-C and VEGF-D from Alginate Hydrogels for Therapeutic Lymphangiogenic Applications**

Kevin Campbell1, Dustin Hadley1, David Kukis1, and Eduardo Silva1

University of California Davis, Davis, CA

2:15 pm

**Plant-inspired Biomimetic and Estrogenic Nanofiber as a Regenerative Wound Dressing**

Karin Campbell1, Dustin Hadley1, David Kukis1, and Eduardo Silva1

University of California Davis, Davis, CA

2:30 pm

**Premineralized Silica Fiber Matrix for Accelerated Bone Regeneration**

Hyun Kim1, Mark Lytes1, and Syam Narekar1

University of Rhode Island, Kingston, RI, University of Connecticut Health, Farmington, CT

*Biomaterials Track sponsored by:*

**OP-Fri-2**

**Room 224B**

**Tracks: Biomaterials, Drug Delivery & Intelligent Systems**

**Drug Delivery Biomaterials II**

Chairs: Shihya Zucchi, Srinivasan Kidambi

1:15 pm

**Leukocytes as Mobile Carriers of Anti-Cancer Therapeutics via Bispecific Liposomes**

Zhenyang Zhang1, Dai Liu1, Nerymar Ortiz-Otero1, Thong Cao1, and Michael King1

Vanderbilt University, Nashville, TN

1:30 pm

**Connectosomes with Chimeric Transmembrane Proteins for Cell-Specific Targeting and Drug Delivery**

Amanda Maniater1, Avinash Gadok1, Chi Zhao1, and Jeannine Stachowski1

The University of Texas at Austin, Austin, TX

1:45 pm

**Tuning Sequential Delivery of Multiple Biological Factors from a Drug Delivery System**

Jumana Alhamdi1, Maria Hurlay1, Gloria Gronowicz1, and Lisa Kuhn1

University of Connecticut (UConnect) Health, Farmington, CT, University of Connecticut, Storrs, CT

2:00 pm

**The Therapeutic Effect of Epigenetic Drug-Releasing Lipid Nanoemulsions for Triple Negative Breast Cancer Cells**

Burtm Kin1 and Debra August1

Northeastern University, Boston, MA

2:15 pm

**Hydrogels for Biomimetic Signal Transduction and Cell Regulation**

Yang Wang1 and Jingping Lai1

Penn State, State College, PA

2:30 pm

**Raising the BAR: Functional and Mechanistic Evaluation of Multi-valent BAR Nanoparticles to Inhibit Oral Biofilms**

Paridhi Kalai1, Anika Jan1, Donald Demuth1, and Jill Steinbach-Rankins1

University of Louisville, Louisville, KY

*Biomaterials Track sponsored by:*
Deformability-based Separation of Pancreatic Islets From Exocrine Acinar Tissue For Transplant Applications

Walter Verhaaf1, Linda Langman2, Molly Kelly-Goss3, Kenneth Brayman4, Shayan Pereira-Caxteller5, and Nathan Sasser6
1University of Virginia, Charlottesville, VA

A Microfluidic Biopsy Tissue Array for Clinical Screening Of Pancreatic Cancer

A H Ahmed1, Chenglong Li1, Helen Kang1, Chun-Wei Chi1, Xuejun Jiang1, and Shuang Wang1
1City University of New York, City College, New York, NY; 2Memorial Sloan Kettering Cancer Center, New York, NY

In Vivo Nanoporter for the Detection of Lysosomal Storage Disorders

Thomas Galasso1,2, Prakriti Jain1, Jani Shah1, Daniel Rosbury1, and Daniel Heller1
1Weill Cornell Medicine, New York, NY; 2Memorial Sloan Kettering Cancer Center, New York, NY; 3University of Rhode Island, Kingston, RI

High-Throughput Liposomes

Jeffrey Watson1 and Marek Romanowski1
1University of Arizona, Tucson, AZ

Optogenetic Cardiac Muscular Thin Film Assay for Prediliction Proarrhythmic Risk Assessment

Li Sun1, Park Keul Yong2, Lee Seo-Jin3, Park Hye-Jin4, Hwang Young-Kyu1, and Paul J. Park1
1Yonsei University, Seoul, Korea, Republic of Korea; 2Inje University, Incheon, South Korea; 3University of Ulsan College of Medicine, Ilsan, South Korea; 4Inje University, Goyang, South Korea

Optical Microscopy-on-Chip Derived from Characterized Human iPSCs with Capillary-like flow for Characterization Of Oncogenic Mutations

Bradley Ellis1, Paolo Contessotto2, Aylin Acun1, U. Isik Can1, Aylin Acun1, Alper Konak1, Patrick H. Campillo4, Francesco S. Pasqualini1, and Kevin Kit Parker1
1Texas Tech University, Lubbock, TX; 2City University of Hong Kong, Hong Kong, Hong Kong; 3University of New South Wales, Sydney, Australia; 4University of Arizona, Tucson, AZ

Bioprinting Exosoma Microenvironment

Siddhesh Bhandarkar1, Karthik Prabakaran1, Abhishek Kaul1, Ramani Gunasekaran1, and Chinthan Manoe1
1Indian Institute of Science, Bangalore, India

Bioprinted Extrusion Organization For In Situ Skin Cell Deposition

Richard Cheng1, Navid Halmi1, Saad Amin-Nik2, Marc Jeschke3, and Axel Guenther1
1University of Toronto, Toronto, ON, Canada; 2Sunnybrook Research Institute, Toronto, ON, Canada; 3University of Toronto, Toronto, ON, Canada
2:30 pm

Friday, October 13 | 1:15 pm–2:45 pm | Platform Session 2

**Platform Sessions—Friday—2—1:15 PM–2:45 PM**

**Room 227C**

**OP-Fri-2.17**

**Track: Biomedical Engineering**

**Sensory Neuroprostheses**

Chair: Bradley Greger, George McConnell

1:15 pm

**Neural ITD Sensitivity and Temporal Coding with Cochlear Implants in an Animal Model of Early-onset Deafness**

Yoojin Chung1, Bertrand Delgutte2

1Massachusetts Eye and Ear, Boston, MA, 2Harvard Medical School, Boston, MA

1:30 pm

**Evolving Visual Percepts via Epipolar Microstimulation in Nonhuman Primates**

Denise Overwal, David Zhou, Prasad Datla, Neil Talbott, Robert Gero, Zaman Mirzadeh, and Bradley Greger

1Arizona State University, Tempe, AZ, 2Second Sight Medical Products, Sylmar, CA, 3Barrow Neurological Institute, Phoenix, AZ

1:45 pm

**Latency of The Perceived Sensation Evoked by Peripheral Nerve Stimulation in People With Lower Limb Amputations**

Breanne Christenson1, Harold Charkhkar2, Emily Graczyk3, Dustin Tyler1, and Ronald Troffa2

1Case Western Reserve University, Cleveland, OH, 2Louis Stokes Cleveland VA Medical Center, Cleveland, OH

2:00 pm

**Median Nerve Stimulation via a FAST-LIFE Array Elicits a Graded Response in Primary Somatosensory Cortex Area 3b**

Justin Tanner1, Taylor Hearn1, Stephen Helms Tillery2, Edward Keefer1, and Jonathan Cheng

1Arizona State University, Tempe, AZ, 2Nervns Incorporated, Dallas, TX

2:15 pm

**Modification of the Proprioceptive Map in an Upper Limb Amputee via Peripheral Nerve Stimulation**

Taylor Hearn1, Justin Tanner1, Cynthia Overstreet3, Jonathan Cheng1, Edward Keefer1, and Stephen Helms Tillery2

1Arizona State University, Tempe, AZ, 2Nervns Incorporated, Dallas, TX

2:30 pm

**Spinal Root Stimulation to Restore Sensation and Reduce Phantom Limb Pain in Upper-limb Amputees**

Lee Fisher, Santosh Chandrasekaran, Amyas Narovdekar, Ahmed Akhtar, Eric Helm, Jennifer Collinger, Michael Boninger, and Robert Gaunt

1University of Pennsylvania, Philadelphia, PA

**OP-Fri-2.16**

**Room 226A**

**Track: Neural Engineering**

**Motor Control and Rehabilitation**

Chair: Dan Moran, Jeff Capadona

1:15 pm

**BCI Control Using Signal from DBS Electrode Implant**

Keith Dyson-Percy, Rory Murphy, and Daniel Moran

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

1:30 pm

**Electrochemical Neural Interfaces for Promoting Motor Plasticity**

Samira Moorryan1, Steve I. Permutt2, and Eberhard E. Fetz1

1University of Washington, Seattle, WA

1:45 pm

**The Effects of Chronic Microelectrode Implantation in Motor Cortex on Motor Behavior in Healthy Rats**

Monika Goor1, Keith Dow1, Justin McMahon2, Andrew Shoffstall2, Evan Everline1, and Jeffrey Capadona2

1Louis Stokes Cleveland VA Medical Center, Cleveland, OH, 2Case Western Reserve University, Cleveland, OH

2:00 pm

**Brain Machine Interface-Driven Afferent Peripheral Nerve Stimulation for Motor Rehabilitation After Spinal Cord Injury**

Sarah Thomas1, Christopher Schmidt1, Elisabeth Powell2, Yuvaraj Rajamannar3, Lamy Sawal1, and Snitkh Sunderam1

1University of Kentucky, Lexington, KY

2:15 pm

**Exploiting the Selectivity of Multi-contact Peripheral Nerve Cuff Electrodes to Prolong Standing Times with Neural Stimulation after Spinal Cord Injury**

Ethan Garfinkle1, Max FreeBSD1, and Ronald Troffa1

1Case Western Reserve University, Cleveland, OH

2:30 pm

**Real-Time Feedback Training to Improve Gait and Posture in Parkinson’s Disease**

Deepika Baskaran, Narayanan Krishnamurthi3, Padma Mahant1, Maria Cristina Orgogozo1, and James Abbas1

1Center for Adaptive Neural Systems, School of Biological and Health Systems Engineering, Arizona State University, Tempe, AZ, 2College of Nursing & Health Innovation, Arizona State University, Phoenix, AZ, 3Barrow Neurological Institute, Phoenix, AZ, 4University of Arizona, Tucson, AZ
BMES 2017 | Phoenix

**INDUSTRY SESSION**

1:00 pm–3:00 pm | Room 125AB

**Clinical Innovators Spotlight**
Chair: Jonathan Guin, BriteWed, and Omid Veiseh, Sigilon

One of the challenges in biomedical engineering careers is developing an understanding of current and anticipated unmet clinical needs, and how to address those needs with existing and new technologies. The audience will be treated to a detailed view, from leading clinical innovators, on how real-world problems in cardiology, oncology, organ transplantation, and orthopedics can be addressed with biomedical engineering solutions.

*Industry Track sponsored by:

**SPECIAL SESSIONS**

1:15 pm–2:45 pm | Room 122A

**Curricular Innovation: Highlighting Your Most Unique or Innovative Course Offerings**
Chair: Terry Johnson

Our courses and curricula reflect the fast-paced, interdisciplinary nature of bioengineering. Each of us has faced challenges in giving students access to—and deciding upon the best methods of delivery for—crucial content and experience. Please, take this opportunity to share with the BMES community your innovative and unique modules, courses, and curricula—and your students’ experiences with them. This special session on education is a series of talks that will allow the community to share with one another their latest curricular work, and related challenges.

1:15 pm–2:45 pm | Room 122A

**Minisymposium on International Research Collaborations and Funding Opportunities in Biomedical Engineering**
Chair: Darr Khismatullin
Co-Chair: Seng Li

This minisymposium is the follow-up of the First International Symposium on Biomedical Engineering that was held at the BMES 2016 Annual Meeting and brought together high-level officials from biomedical engineering societies in the United States, Canada, Australia, South Korea, and China. It consists of several talks by leading biomedical engineers showcasing successful externally-funded research collaboration between the United States and other countries participated in the First International Symposium. The talks will be followed by panel discussion of funding opportunities available for international collaborative research in bioengineering.

Invited speakers:
X. Edward Guo (Columbia University)
Stephanie Willerth (University of Victoria, Canada)
Deok-Ho Kim (University of Washington)

**OP-Fri-3-1**

**Track:** Biomaterials

**Biomaterials Scaffolds I**
Chair: Josephine Allen, Sarah Stabenfeldt

3:30 pm

A Novel Tri-Component Polymeric Electrospun Scaffold for Vascular Tissue Engineering
Vidhya Ramaswamy1, Taylor Repetto2, and Josephine Allen2
1University of Florida, Gainesville, FL
2University of Washington, Seattle, WA

3:45 pm

Design of a Modular Fibrin-Based Cardiac Patch
Megan Chinbati1, Katrina Hansen1, Marianne Kamel1, Josh Genn1, Glen Gaudette1, and George Firs1
1Worcester Polytechnic Institute, Worcester, MA

4:00 pm

Functionalization of Titanium with Poly (acrylic acid) Brushes
Ana Manjarrez1, Alice Rosen1, Martha Schubert1, Eva Franke-Schubert1, Petra Uhlemann1, and Angela K. Panhuis1
1University of Nebraska-Lincoln, Lincoln, NE, USA
2Institut für Polymerforschung Dresden e.V, Dresden, Germany
3Technische Universität Dresden, Dresden, Germany

4:15 pm

Effect of Electrical Stimulation on Nerve Cells as a Function of Hydrogel Stiffness and Electrical Conductivity with a Custom Designed Device
Muhshad Imran1, Ali Khan2, Reetu Khatkhuw1, Reem Bera3, and Shilpa Zutshi4
1Saint Louis University, St Louis, MO
2University of Utah, Salt Lake City, UT
3University of Florida, Gainesville, FL
4University of Washington, Seattle, WA

4:30 pm

Nanofiber Scaffolds of Protein-loaded Porous Silicon Nanoparticles in Polycaprolactone by Spray Nebulization
Jonathan Zugriva1, Tushar Kamatra1, Doyoung Kim1, Jinyoung Kang1, Joanna Wang1, Geoffrey Hollett1, and Michael Sailor1
1University of California San Diego, La Jolla, CA
2Worcester Polytechnic Institute, Worcester, MA

4:45 pm

Conditions for Maintenance Of Reactive Amine Groups During Post-Processing of an Elastomeric Biomaterial
Harleigh Warner1,2 and William D. Wagner3
1Virginia Tech and Wake Forest University, Winston-Salem, NC
2University of Florida, Gainesville, FL
3Wake Forest University School of Medicine, Winston-Salem, NC

**OP-Fri-3-2**

**Track:** Drug Delivery & Intelligent Systems, Biomaterials

**Drug Delivering Biomaterials III**
Chair: Craig Duvall, Rebecca Willis

3:30 pm

Optimization of Protein-Loaded Electrospun Fibers for Targeted Intestinal Delivery
Hannah Frizzell1 and Kim A. Woodrow1
1University of Washington, Seattle, WA

3:45 pm

Disruption of Gram-negative Bacterial Membranes via Peptide-based Potentiators for Intracellular Delivery of Small Molecule Antibiotics
Leide Chan1, Kelsey Hem1, Estter Kwok1, Katie Lee2, Deborah Hung2, and Sangpetera Bhada1
1Massachusetts Institute of Technology, Cambridge, MA
2Brown Institute, Cambridge, MA

4:00 pm

Resorbable Antibiotic-eluting Bone Void Filler Performance in a Large Animal Model to Address Periprosthetic Joint Infection
David Grennier1 and Eric Zeisler1
1University of Utah, Salt Lake City, UT

4:15 pm

Self-assembled Galectin-enzyme Fusions for Localized Biocatalysis
Shaheen Farhad1, Margaret Fett1, Evelyn Bracho-Sanchez1, Sabrina Freeman1, Benjamin Kashefsky1, and Gregory Hublau2
1University of Florida, Gainesville, FL
2University of Florida, Gainesville, FL

4:30 pm

Cetastol-Loaded Nanocarriers for Targeted Therapeutic Inhibition of Inflammatory Cells
Sean Allen1, Sungyong Lee2, and Evan Feinberg2
1Northwestern University, Evanston, IL
2University of Utah, Salt Lake City, UT

**4:45 pm**

Acatelated Dextran Nanoparticles for Rapid and Glucose Responsive Insulin Delivery
Lisa Volpatti1, Robert Lange1, and Daniel Anderson1
1Massachusetts Institute of Technology, Cambridge, MA

**Biomaterials Track sponsored by:**

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3:45 pm

Putting on the Squeeze - Why You Need Compressibility to Model Actively Contracting Myocardium
Jiao Soare1, David U1, Joseph Gorman III1, Robert Gorman1, and Michael Sachs1
1University of Texas at Austin, Austin, TX, 2University of Pennsylvania, Philadelphia, PA

4:00 pm

Engineering 3D Cardiac Microtissues with Tunable Mechanical Load
Jacqueline Billey1, Rebecca Duffy1, Ivan Batelov1, Dan Shiwenki1, Rachelle Sunko1, Anna Kalmykov1, Matilda Vermeer1, and Adam Fawcett1
1Carnegie Mellon University, Pittsburgh, PA, 2University of Medical Center Groningen (UMCG), Groningen, Netherlands

4:15 pm

Targeting Sorbitol 2B Receptor to Improve Cardiac Function Following Myocardial Infarction
J Caleb Snider1, Qirun Zhang1, Hind H1, and W David Meryman1
1University of Notre Dame, South Bend, IN

4:30 pm

In Situ Organ-Level Modeling of Murine Cardiac Function: Application to Pulmonary Arterial Hypertension
Rosa Avaz1, Emily Mendolza1, Jiao Soare1, David U1, Jordan Graves1, Richard Dixon1, Edward H1, and Michael Sachs1
1UT Austin, Austin, TX, 2Texas Heart Institute, Houston, TX, 3University of Utah, Salt Lake City, UT

4:45 pm

Direct Infarct Injection of Thermo-responsive Hydrogel Improves Contractile Protein Function in the Borderzone
Kimberly Spaulding1, Anusuya Rameshraman1, Kiyuki Takabe1, Henrik Haraldsson2, Alexander Cutleri1, Eitan Aji2, David Lovett1, Anthony Baker1, Kevin Hazlett1, and Mark Statistics1
1Veterans Affairs Bay Area Health Care System, San Francisco, California, 2University of California, Berkeley, Berkeley, CA, 3University of California San Francisco, San Francisco, CA

5:00 pm

A Temporal Examination of Platelet Counts as a Predictor of Prognosis in Lung Cancer Patients
Joanna Sylman1,2,3, Garth Tormoen3, Annachiara Mitrugno 3, Todd Wilcox3, and Joanna Hymes4
1University of Michigan, Ann Arbor, MI, 2University of California, Berkeley, Berkeley, CA, 3University of California, San Francisco, San Francisco, CA

5:15 pm

Noninvasive Prediction of Aggressive Prostate Cancer through Protease Nanosensors
Jaydene Dooley1, Maria Ibrahim1, Jesse Kripa1, Andrew Warren1, and Sangeeta Bhatia1
1Massachusetts Institute of Technology, Cambridge, MA

5:45 pm

A Micrometric Detection Device for Resource-Limited Settings
Christopher Bobba1, Megan Ballinger2, Joshua Englert2, and John Costi1
1University of Delaware, Newark, DE, 2University of California, Berkeley, Berkeley, CA

6:00 pm

Putting on the Squeeze - Why You Need Compressibility to Model Actively Contracting Myocardium
Jiao Soare1, David U1, Joseph Gorman III1, Robert Gorman1, and Michael Sachs1
1University of Texas at Austin, Austin, TX, 2University of Pennsylvania, Philadelphia, PA

6:15 pm

Mechanobiology of Arterial Hypertension
Samir Ghadiali1,2
1The Ohio State University, Columbus, OH, 2The Ohio State University College of Medicine, Columbus, OH
Friday, October 13 | 3:30 pm–5:00 pm | Platform Session 3

4:00 pm
3D Intestinal Spheroids as a Biomimetic Model for Studying Drug Transport
Karen Samy1, and Tjw Ellis2
1University of California San Francisco, San Francisco, CA

4:15 pm
The Role of Cellular Morphology in Nanoparticle Uptake
Pouria Fattahi1, Yin Ting Yeh2, Si-Yang Zheng3, Sulin Zheng4, Justin Brown2, and Tjw Ellis2
1University of Maryland, College Park, MD, 2Pennsylvania State University, University Park, PA

4:30 pm
Intra-Cartilage Delivery of RNA Therapeutics via Nanopiece to Treat Osteoarthritis
Yuzeng Chen1,2, Qinghan Huang1, Brandon Vertrus3, Hicham Fennais1,4, Thomas Webster1,2,3, and Qian Chen1
1Brown University, Providence, RI, 2Rhode Island Hospital, Providence, RI, 3Northeastern University, Boston, MA, 4Boston University, Boston, MA

4:45 pm
Fluid Platform for Disease in vivo Interrogation of Pancreatic Islets
Matthew Ibrahim1, Giovanni Lenguig1, Siddarth Rawal1, Peter Buchwal2, Charmaine Agyekum-Ampah1, and Ashok Garg2
1University of Miami, Miami, FL, 2University of Florida, Gainesville, FL

OP-Fri–3–9 Room 222

Tracks: Cellular and Molecular Bioengineering, Tissue Engineering
Engineering Multi-cellular Systems

Chairs: Omid Vessal, Warren Grejnow

3:30 pm
Sex Differences in the Impact of Oxygen and Pathogen Exposure on Human Colon Biopsy Slices
Lukew Schwaedel1,2, Erica Borenstein1, Elizabeth Ryan1, and Stuart Tobel1
1Colorado State University, Fort Collins, CO

3:45 pm
3D Bi-cellular Biomimetic Model of Vasculitis Reveals a RhoA, Rac, and N-cadherin Balance in Pericyte-regulated Barrier Function
Stella Alpim2,3, Teodolinda Mirabello1,2, Vincenzo Baj2, William Polacheck1,2,3, and Christopher Chant1
1Harvard University- Wyss Institute for Biologically Inspired Engineering, Boston, MA, 2Boston University, Boston, MA

4:00 pm
Engineering Vascularized Livers to Recapitulate Organ-Level Functions
Arina Mitre1, Hyun-Hee Song1, Christopher Chant2, and Sangeeta Bhatia1
1Massachusetts Institute of Technology, Cambridge, MA, 2Boston University, Boston, MA

4:15 pm
Transcriptome Profiling of 3D Co-cultured Cardiacmyocytes and Endothelial Cells under Oxidative Stress Using a Photocrosslinkable Hydrogel System
Xiaowen Yue1, Jadul Anand2, and Pinar Zorlutuna1
1University of Notre Dame, Notre Dame, IN

4:30 pm
Engineering Customized Cellular and Multiscale Sensing and Response Behaviors Using Synthetic Nucleic Receptors
Leonardo Muzi1
1University of Southern California (USC), Los Angeles, CA

4:45 pm
Engineering Biomimetic Hydrogels to Support Hepatocyte Phenotype and Function
Aki Unai1, Sydney Jethi1, and Jennifer West1
1Duke University, Durham, NC

OP-Fri–3–10 Room 223

Track: Cellular and Molecular Bioengineering
CMBE Young Innovators II

Chairs: Michael King, Alyssa Fantich

3:30 pm
Data-modeling Identifies Conflicting Signaling Axes Governing Myoblast Proliferation and Differentiation Responses to Diversity
Liganz Sun1,2, Alexander M. Loiben1,2, and John H. Segre3
1University of California, Los Angeles, CA, 2Department of Computer Science, University of California, Los Angeles, CA, 3Department of Pediatrics, University of California, Los Angeles, CA

3:45 pm
Distinct Roles of Direct Contact and Secreted Factors in the Immunomodulatory Effects of Cryopreserved Visible Human Aminiotic Membrane
Claire E. Whitham1,2, Tony Yu2, Mark Concanon3, Will Dampier2, and Kara Spiller1
1Drexel University, Philadelphia, PA, 2Drexel University College of Medicine, Philadelphia, PA

4:00 pm
Microscope Protocorrection Across the Tumor Border: Cancer Cell Response to Doxorubicin Depends on Stromal Fibroblast Ratios and Interstitial Therapeutic Transport
Jenifer M. Miller1,2, Daniel K. Logan3, and Gerrett Bebgley1
1University of Virginia, Charlottesville, VA

4:15 pm
Signaling-Dependent Nanoceria Mitigate Oxidative Stress-induced Calcification in Primary Human Valvular Intestinal Cell Culture
Youanghai Xie1, Cynthia St. Hilary2, Lucia Forcelli1, Julie A. Phillips1, and Vignesh Senthil3
1University of Pittsburgh, Pittsburgh, PA

4:30 pm
Tethered Jagged-1 Synergizes with Matrix Stiffness to Modulate Notch-induced Myogenic Progenitor Differentiation
Katie Gilbert1,2, Halin Safai1, Michael Bakooshchi1, Richard Cheng1, Haisi Liu1, Sadegh Davoudi1, Ashia Mortowirogo1, and Craig Simmons1
1University of Toronto, Toronto, ON, Canada, 2Tedd Rogers Centre for Heart Research, Toronto, ON, Canada

Friday, October 13 | 3:30 pm–5:00 pm | Platform Session 3

OP-Fri–3–11 Room 225A

Track: Biomedical Imaging and Optics
Imaging Techniques in Clinical Translation
Chairs: Narayanan Ramasamy, Ramon Peshawar

3:30 pm
Automated and Cost-Effective Antimicrobial Susceptibility Testing on a Mobile Phone
Steve Feng1,2, Duncan Tseng3, Calvin Brown4, Dino Di Carlo1,2,3, Omar Garnier1,4, and Aydogan Ozcan1,2
1Electrical Engineering Department, University of California, Los Angeles, CA, 2Bioengineering Department, University of California, Los Angeles, CA, 3California NanoSystems Institute, University of California, Los Angeles, CA, 4biTriage Comprehensive Cancer Center, University of California, Los Angeles, CA, 5Department of Pathology and Laboratory Medicine, David Geffen School of Medicine, University of California, Los Angeles, CA, 6Department of Surgery, David Geffen School of Medicine, University of California, Los Angeles, CA

3:45 pm
Intracranial Electrical Impedance Tomography for TBI Monitoring
Ryan Haller1
1Dartmouth College, Hanover, NH

4:00 pm
A Novel Low-cost Compact Diffuse Speckle Contrast Flowmeter for Contact Blood Flow Measurement
Seash Mao1,2, Young Hong Huang1, Myoungsoo Seong1, Joshua Morgan1, Mingjun Zhai2, Ahmed Bahrami1, Joe Kim1, Jeffrey Hastings1, and Gwiyangkwan Yu1
1University of Kentucky, Lexington, KY, 2Geisinger Institute of Science and Technology, Geisinger, Korea, Republic of

4:15 pm
Development of Augmented Microscope for Image Guided Surgery
Lauri Calo1,2,3,4, Sarah Mazzoni5,6,7, Nikolay Martemyanov2, Michael Lampert1,2,3, and Marek Romanowski1
1University of Arizona, Tucson, AZ, 2Barnes University Medical Center, Torrance, CA, 3University of California, Los Angeles, CA, 4Jonsson Comprehensive Cancer Center, University of California, Los Angeles, CA, 5Department of Surgery, University of California, Los Angeles, CA, 6Department of Pathology and Laboratory Medicine, David Geffen School of Medicine, University of California, Los Angeles, CA

4:30 pm
Monitoring Exocytosis and Full Fusion of Fusin Granules via Graphene Liquid Cell Transmission Electrorn Microscopy Imaging
Meagan Ouy1,2, Emre Firat3,2, Shayan ShahRezaee1,2, Xingwen Ying1,3, Andreas Char1,2,3,4, Burcu Izzettin3, Sevak Aleksi2,3,4, Yong Wang3, and Jose Oberholzer1
1University of Illinois at Chicago, Chicago, IL

4:45 pm
Hyperpectral Imaging for Cancer Detection and Image-guided Surgery
Bassam Farok1,2, Gudun Li1, Martin Halicki1, James Little1, Xue Wang4, and Amy Chen1
1Emory University and Georgia Institute of Technology, Atlanta, GA, 2Emory University School of Medicine, Atlanta, GA, 3Emory University, Atlanta, GA

PLATFORM SESSIONS—FRIDAY—3–3:30 PM–5:00 PM

PLATFORM SESSIONS—FRIDAY—3–3:30 PM–5:00 PM
Op-Fri-3-12  Room 225B
Track: Biomedical Imaging and Optics
Applications of MRI and Focused Ultrasound
Chairs: Stephen Lo Conte
3:30 pm Quantitative T1 Mapping of Breast Cancer Xenografts During HIFU Ablation
Sarah Johnson1, Jill Shiao2, Aloni Payne2, Sarah Grimes3, James King1, and Sarah Grimes3
1University of Utah, Salt Lake City, UT, 2Huntsman Cancer Institute, Salt Lake City, UT
3:45 pm Toward Personalized Medicine in Autism Diagnosis: Anatomical Abnormalities Analysis Using a Deep Learning Based Approach
Omar Dahi1, Mohammed Shabab2, Ahmed Shalaby1, Andy Sattar1, Gregory Barna1, Ayman El-Bak1, and Aisha Khalil1
1University of Illinois at Urbana Champaign, Urbana, IL, 2Department of Electrical and Computer Engineering, Abu Dhabi University, UAE, Abu Dhabi, United Arab Emirates, 3Abu Dhabi University, Abu Dhabi University, United Arab Emirates
4:00 pm Effect of Exercise on Myocellular Lipid Content and Diffusion Tensor Imaging Measurements
Thomas Talavage1, Pratik Kashyap1, Kausar Abbas1, Sharlene Newman2, and John Cavanaugh1
1University of Louisville, Louisville, KY, 2Department of Electrical and Computer Engineering, Abu Dhabi University, UAE, Abu Dhabi, United Arab Emirates, 3Abu Dhabi University, Abu Dhabi University, United Arab Emirates

Op-Fri-3-13  Room 228A
Track: Device Technologies and Biomedical Robotics
Upper-Limb Exoskeletons
Chairs: Simon Kudernatsch1, Jennifer Kosac2
3:30 pm A Real-Time EMG Based Embedded Controlling System for Intuitive Exoskeleton
Biao Chen1, Chaoyuan Chen1, Ji Hui2, Pan Tian3, Ying Zhou3, Krunal Shah4, Mark Ming-Cheng1, Cheng2, Shanghui Jiao3, Yong Wang4, and Chaoyang Chen1
1Baylor College of Medicine, Houston, TX, 2China Capital Medical University, Beijing, China, 3People’s Republic of China, 4Wayne State University, Detroit, MI
3:45 pm Kinesiology of Light Weight Bionic Upper Arm Exoskeleton and Computer Simulation
Yousuf Abudhakil1, Guanzhu Xu1, Chenyang Chen1, Ying Zhou3, Min Li2, and John Carreau2
1Wayne State University, Detroit, MI, 2Xi’an Jiaotong University, Xi’an, China, People’s Republic of China
4:00 pm Robotic Exoskeleton for Upper Extremity Strength Augmentation: REVUESA
Simon Kudernatsch1 and Donald Patton2
1The City College of New York, New York, NY, 2University of Wisconsin-Madison, Madison, WI
4:15 pm EMG Based Control of a Wearable Robot for Elbow and Forearm Movement Assistance
Faidi Garma1, Jennifer Kosac2, Mohammad Hakob-Pastor3, and Maorad Saad4
1University of Wisconsin-Milwaukee, Milwaukee, WI, 2Ecole de technologie supérieure, Montreal, QC, Canada
4:30 pm Movement of A Paralyzed Hand With Elastomeric Orthotics
Edwards4, Charles Keams5, Mitchell St. Pierre6, Young Ho Shin7, and Jin Woo Choi7
1Baton Rouge General Medical Center, Baton Rouge, LA, 2Louisiana State University, Baton Rouge, LA
4:45 pm DEexterious hand control through Fascular Targeting (DEFT)
Cynthia Ovare-Stewart1, Jonathan Cheng2, and Edward Keefer1
1Nerves Incorporated, Dallas, TX, 2UT Southwestern Medical Center, Dallas, TX

Op-Fri-3-14  Room 228B
Track: Cancer Technologies
Molecular Profiling in Cancer
Chairs: Gabe Kowg1, Kristen Negele3
3:30 pm Microfluid Spatial Gene Expression Analysis Using Real-Time Reverse Transcriptase Loop Mediated Isothermal Amplification for Molecular Histopathology
Anurag Ganguli1, Gregory Dambrose1, Nikolaos Spagnoli1, Alia Omidi2, Tammy Shong1, Brianna Thornton2, Christian Konopka1, Alexander Olszewski4, Rohit Bhargava1, Farhat Kosovo1, and Rashid Bashir1
1University of Illinois at Urbana Champaign, Urbana, IL, 2Illinois Institute of Technology, Lake Forest, IL, 3Mayo Clinic Cancer Center, Rochester, MN
3:45 pm Sphingosine-1-Phosphate Inhibits Adhesion of Malignant Cancer Cells MDA-MB-231 to Microvessel Walls by Protecting Endothelial Surface Glycolipids
Lin Zhang1, Min Zeng2, and Bingmei Fu1
1The City College of New York, New York, NY, 2New York, NY
4:00 pm Nanoparticle Relaxation Mechanism Plays a Role in Lysosomal Membrane Permeabilization
Andriana Choi1, Rachel Donohue2, Malena Cruz-Azuana2, and Carlos Rinaldi1
1University of Florida, Gainesville, FL
4:15 pm Implantable Nanosensor Detection of an Ovarian Cancer Biomarker In Vivo
Ryan Williams1, Christopher Lee2, Thomas Galassi3, Jackson Harvey4, Rachel Leischer5, Sarah Srenko6, Jared Shih4, Nicosia Olivera7, Farah Daas8, Danielle Leventhal9, and Daniel Heller10
1Memorial Sloan Kettering Cancer Center, New York, NY, 2Wisconsin Institute for Discovery, Madison, WI, 3Tulane University School of Medicine, New Orleans, LA, 4Institute for Chemical Biology, New York, NY, 5NYU Langone Medical Center, New York, NY
4:30 pm Protease-Activated Detection and Imaging of Cancer Metastasis
Liangjiao Hao1 and Sangeeta Bhatia1
1Massachusetts Institute of Technology, Cambridge, MA, 2Harvard Medical School, Boston, MA
4:45 pm Rapid Production of Bispecific Antibodies Using Off-the-shelf IgG
Andrew Tsaurkas1 and Burcin Altun1
1University of Pennsylvania, Philadelphia, PA

Op-Fri-3-15  Room 227C
Track: Stem Cell Engineering
Organoid Engineering and Advanced Biomanufacturing
Chairs: Taly Ahnani, Kelly Stevens
3:30 pm Self-organized Amniogenesis from Human Pluripotent Stem Cells in an Engineered Biomorphic Niche
Yue Shao1, Kanchito Tandoh2, Katharine Gordan1, Ryan Townsend2, Xin Yufan3, Kham Meng Au Yong4, Jianming Sang1, Jason Spencer1, Deborah Rutkowski1, and Jianping Fu1
1University of Michigan, Ann Arbor, Ann Arbor, MI, 2University of Michigan Medical School, Ann Arbor, MI, 3Wayne State University, Detroit, MI
3:45 pm Engineering CNS Morphogenesis: De Novo Synthesis of Neural Tube Slices Cultures
Gavin Knight1 and Randolph Achiou2
1University of Wisconsin, Madison, WI, 2Wisconsin Institute for Discovery, Madison, WI
4:00 pm Engineering 3-D Neural Organoid Morphology using PVOH-ca Sacrificial Templates
Cartier Bertha-Figueroa1, Jason McNulty1, Joshua Plants1, Lih Sheng Tung2, and Randolph Achiou1
1University of Wisconsin - Madison, Madison, WI
4:15 pm Mechanically Guided Emergent Patterning of Neuroectoderm Tissue Using Human Pluripotent Stem Cells
Kung Fu1, Hsiang Hung Sun1, Agnes Rezai-Zarrin2, Khai Meng Ang Yong3, Shinus Wong1, Yue Shao1, and Jianping Fu1
1University of Michigan, Ann Arbor, MI, 2University of Massachusetts, Amherst, MA
4:30 pm In Vitro Production of Functional Pancreatic Islets from iPSC-Derived Organoids
Hwayeong Brim1, Khameng Yu4, and Shao Jia2
1SUNY-Binghamton, Binghamton, NY
4:45 pm Rational Design of Synthetic Matrices to Guide Intestinal Stem Cell Morphogenesis
Victor Hernandez-Gordillo1, GiHun Choi1, Neha Gandhi2, Nicole Zamora3, Debrah Lenchner4, and Daniel Heller1
1University of Illinois at Urbana Champaign, Urbana, IL, 2Northeastern University, Boston, MA, 3Harvard Medical School, Boston, MA, 4New York University, New York, NY

Friday, October 13 | 3:30 pm–5:00 pm | Platform Session 3

OP-Fri-3-16  Room 226A
Track: Neural Engineering
Micro/Nano Tools in Neurosciences
Chairs: Eritk Sela, Anja Künze
3:30 pm
Selective Partial Perfusion of in Vivo Single Axons Using a Simple Microfluidic Device
Anthony Fan1, Almeza Tofangchichi2, and Taher Safi1
1University of Illinois at Urbana-Champaign, Urbana, IL
2University of Illinois, Urbana, IL
3:45 pm
Manipulation of In Vitro Neurite Outgrowth using Nanoplasmonic Neural Interface Platform
Nari Hong1 and Yoonkoo Nam2
1KAIST, Daejeon, Korea, Republic of
2University of Texas, Austin, TX
4:00 pm
Nanoporous Gold Biointerfaces: Modifying Nanostructure to Control Neural Cell Coverage and Enhance Electrophysiological Recording Performance
Christopher Chapman1, Ling Wang1, Hao Chen2, Joshua Garrison3, Pamela Lee4, and Erik Seibel4
1University of California, Davis, Davis, CA
2University of Illinois at Urbana-Champaign, Urbana, IL
3Louisiana Tech University, Ruston, LA
4Purdue University, West Lafayette, IN

OP-Fri-3-17  Room 226B
Track: Neural Engineering
Neural Decoding
Chairs: Dean Taylor1 and Tyler Johnson2
1Cleveland Clinic, Cleveland, OH
2Louis Stokes Cleveland VA Medical Center, Cleveland, OH
3:30 pm
Investigating Force Perception By Means of Muscle Synergies Analysis
Simona Torta1 and Marco Santello2
1Arizona State University, Tempe, AZ
2University of Southern California, Los Angeles, CA
3:45 pm
Artificial Neural Network Models for Predicting Reaching and Grasping Behavior from Neural Activity in Motor Cortex
Adam D. Rose1, Matt H. Schrader1, and Thomas M. Howard1
1University of Rochester, Rochester, NY
4:00 pm
Extracting More Information from Field Potentials Using Band-Optimized Spatial Filtering
Dawn Taylor1 and Tyler Johnson2
1University of California, Davis, Davis, CA
2University of Illinois at Urbana-Champaign, Urbana, IL
4:15 pm
A Computational Study of Probe Design for Source Localization in Multi-unit Neural Recordings
Patrick Greene1 and Kevin Lin2
1University of Arizona, Tucson, AZ
2University of California, San Francisco, CA
4:30 pm
Blended Polymeric Nanoparticles to Modulate Retinoid Signaling in a Transgenic Murine Model of ALS
David Medina1, Eugene Chung2, Rick Ceton3, Robert Brown4, and Rachael Sinar5
1Barrow Neurological Institute, Phoenix, AZ
2University of Arizona, Tucson, AZ
3Louisiana Tech University, Ruston, LA
4Milwaukee School of Engineering, Milwaukee, WI
5University of Illinois, Urbana, IL
4:45 pm
Deconstructing Behavioral Neuroprognostication with Cellular Specificity
Brenda Sheidij, Elizabeth Kahuno1,2, Sarah Lindo1,3,4,5, and Joseph Tranquillo1,2
1University of Arizona, Tucson, AZ
2Barrow Neurological Institute, Phoenix, AZ
3University of Rochester, Rochester, NY
4Louis Stokes Cleveland VA Medical Center, Cleveland, OH
5University of Illinois, Urbana, IL

Friday, October 13 | 3:30 pm–5:00 pm | Platform Session 3

OP-Fri-3-18  Room 227C
Track: Biomedical Engineering Education (BME)
Design and Curriculum
Chairs: Casey Ankeny, Elizabeth Logsdon
3:30 pm
Incorporating the Patient Experience into a BME Class
Daniel Cavanaugh1 and Joseph Tranquillo1,2
1Bucknell University, Lewisburg, PA
2University of Southern California, Los Angeles, CA
3:45 pm
Evaluation of a Clinical Immersion Course and its Impact on Engineering Design Projects
Adam Engler1 and Geert Schmid-Schonbein2
1UC San Diego, La Jolla, CA
2Sanford Consortium for Regenerative Medicine, La Jolla, CA
4:00 pm
Online Lesson Viewing Patterns in Two Flipped Classroom BME Courses
Jean-Michel Maerki1
1University of Southern California, Los Angeles, CA
4:15 pm
Mentoring for INnovative Design Solutions (MINDS) Program Integrates Key Design Considerations for Clinical Translation
Teresa Murray1,2, Alicia Fernandez-Fernandez1,2, Dominic Nathan1,2, Jeffrey Laffack1,2, Brian Vora2, and Marcia Post1
1Louisiana Tech University, Ruston, LA
2Alpha Eta Mu Beta, Sanford Consortium for Regenerative Medicine, La Jolla, CA
4:30 pm
Curriculum to Advance Capstone Design Projects Beyond the One Year
Elizabeth Logsdon1, Robert Allen1, Mary Emma Gorham Bigelow2, Anni Marbach3, and Nicholas Dunn4
1Johns Hopkins University, Baltimore, MD
2UC San Diego, La Jolla, CA
3University of Minnesota, Minneapolis, MN
4University of Southern California, Los Angeles, CA
4:45 pm
Concept Mapping in a Student-Centered, Biomaterials Classroom
Mikayla Holm1, Rachel Ponsen1, Sarah Stabenfeldt2, and Casey Ankeny1
1University of Minnesota, Minneapolis, MN
2Arizona State University, Tempe, AZ

*BME Track sponsored by:

INDUSTRY SESSION
3:00 pm–5:00 pm | Room 125AB
Investment Pitches and Partnering
Chair: Clark Wilson, Merchant and Gould P.C.
This session will be a forum for select companies to pitch to four venture capitalists interested in providing funding for start-up ventures. The business categories will align with the interests of the participating VCs. Each venture capitalist will be available after the pitches for questions and networking.

SPECIAL SESSION
3:30 pm–5:00 pm | Room 122A
Symposium in honor of Dr. and Mrs. Athanasiou
Chair: Michael Detamore
In recognition of Dr. Kyriacos Athanasiou’s sustained commitment to the field of biomedical engineering in general and to BMES in particular, serving as President in 2003-2004, as Editor in Chief of the Annals of Biomedical Engineering since 2009, and for creating an award endowment with his wife, Kiley, to honor the next generation of biomedical engineers.
Friday, October 13 | 9:30 am–5:00 pm | Exhibit Hall 300 North

Poster Viewing with Authors & Refreshment Break | 9:30 am–10:15 am and 2:45 pm–3:30 pm

**Track: Device Technologies and Biomedical Robotics**

**Affordable Health Devices and Frugal Innovation**

FRI-1
An Effective Tool to Eradicate Root Canal Infection: Based on Electrochemistry
Abhijith Se gap, Dwayan Byakumurer, Sukanto Cortomo, Gian Xie, and Matthew T Mathew
1University of Illinois at Chicago, Rockford, IL, 2UIC College of Dentistry, Chicago, IL

FRI-2
Aramid Nanofiber Composite Separators for Flexible Zinc-Based Thin Film Batteries
Ahmet Emre and Nicholas Kotov
1University of Michigan, Ann Arbor, MI

FRI-3
CT-Derived, 3D-Printed Needle Guide to Mark the Alveolar Foramen Prior to Pediatric Craniofacial Surgery
Amanda Banks, Alexa Mahiri, Alexander Liu, and Andrew Hall
1Saint Louis University, Saint Louis, MO, 2Saint Louis University School of Medicine, Saint Louis, MO

FRI-4
Rapid Electroanalytical Device for Single Drop Dengue Diagnosis
Ambalika Tanak, SriRam Mathukumal, and Shalini Prasad
1University of Texas at Dallas, Richardson, TX, 2EnLiSense LLC, Allen, TX

FRI-5
Automatic Measurement of Pulpal Responsiveness for Vitamin A Deficiency Diagnostics
Amir Soltanianzadeh, Katie Healy, Sucheta Mehra, Amanda Palmer, Theodor Sauer, Alfred Sommer, Keith West, and Alan Labrique
1Johns Hopkins University, Baltimore, MD

FRI-6
Preliminary Refractive Index Measurements in a Portable Optical Cavity Biosensor
Cody Joy, Dangyee Rho, and Seunghun Kim
1Baylor University, Waco, TX

FRI-7
Spinal Cannulation Automated Navigation (SCAN) Robotic System
David Li, Ahmed Mac, Antonio Daniel, Dora Oboodi, Lan-Kheth Tran, Qudsia Javid, Feitian Zheng, and Mahesh B. Shenai
1George Mason University, Fairfax, VA, 2INOVA Fairfax Hospital, Falls Church, VA

FRI-8
Harnessing Virtual Reality in Robotic Assistive Devices
Dewarg Saurav Dhakshinamurti, Mahesh Shenai, and Nathania Peretz
1George Mason University, Fairfax, VA, 2Inova Fairfax Medical Campus, Fairfax, VA

**FRI-9**
Design of an Improved Skin Graft Knife: The Motorized Weck Blade
Garret Glenn, Alexis Morgan, Matthew Rodrigue, and Oliva Coiado
1University of Portland, Portland, OR

**FRI-10**
A Simple, Accurate, and Reproducible Method to Quantify the Tension on Fascial Closures in Hernia Repair
Jamie Bierman, Adam Levy, Lawrence Bonasera, and Jason Specter
1Weill Cornell Medical College, New York, NY, 2Cornell University, Ithaca, NY

**FRI-11**
A Point-of-Care Screening Platform for Serotargets of Severe Acute Malnutrition
Jay Gupta, Amy Cheng, Daniel Jish, Trenton Danley-Chwialko, Angus Hucknell, Zhenghe Wei, Apilogen Ozturk, Benjamin Guesteld, Michael Freemark, and Arthush Chikli
1Dubai University, Durham, NH, 2Action Contre la Faim, Paris, France, 3North Carolina State University, Raleigh, NC, 4University of California, Los Angeles, CA

**FRI-12**
Development of an Affordable 3D Printed Bionic Hand using Underactuation Principle
Jonathan Robinson, Rebecca Doane, Christopher Hicks, David McLeod, Alexander Otterman, Matthew Roach, Andrew Sadler, Melissa McCullough, and Jorge Rodrigues
1Clemson University, Clemson, SC

**FRI-13**
Continuous Flow Bioreactor System with pH and Dissolved Oxygen Monitoring for Cell Expansion
Katherine Gillerin, Maria Garcia, and Colin Tomasselli—Greenleaves
1Hotchkis University, Hemptead, NY

**FRI-14**
Rapid Prototyping of 3D Microfluidics Using Low-cost Materials and Maker Tools
Kevin Bishop, Megan Co, and Matthew Johnston
1Cheong Sate University, Corvallis, OR

**FRI-15**
A Straightforward Low-Cost Test for Sickle Cell Disease
Kevin Cui, Jennifer Colby, and Christine Maracos
1Vanderbilt Institute for Integrative Biosystems Research and Education, Nashville, TN, 2Vanderbilt University Medical Center, Nashville, TN

**FRI-16**
Design of a Laminar Flow Hood for a Vietnamese Pediatric Hospital
Krunal Patel, Maxwell McKeough, and Miiri Kotche
1University of Illinois at Chicago, Chicago, IL
FRI-17 The Recovery Glove System—A Sensor Driven Glove with interactive games for Fine Motor Skill Disabilities
Oscar Lendon, Jonathan Ray1, Brian Lee, Nicholas Alvarado, Erick Morales, David Estrada, and Deborah Wan
1California State University Los Angeles, Los Angeles, CA
FRI-18 LifeGlo: A Container for Safe Organ Transport
Ramon Emlaini, Emilio Botero1, Juan Diaz-Boada1, and Alejandro Posada
1Universidad de los Andes, Bogota, Colombia
FRI-19 Development of a Rapid, Point-of-Care Diagnostic Test for Diagnosis of Aspergillosis
Rebecca Ulrich von Bargen1
1The University of Oklahoma, Norman, OK
FRI-20 Building a Proposal for an Institution-wide 3D Printing Program
Robert Wesley
1Nickle's Children's Hospital, Miami, FL
FRI-21 Portable Artificial-Intelligent Real-Time (PAIRT) Affordable Bionanosensor for DNA Hybridization
Sohin Kur1, Samuel Olpp2, Shawn Penal3, Shawn McIntyre, Sethan Jasti, and Sasan S plain
1Saratoga High School, Saratoga, CA, 212-15 Molecular Diagnostics LLC, Branford, CT, 3University of New Haven, West Haven, CT
FRI-22 Low-Cost Mobile Data-Logging System to Track Patient Condition and Location
Tekulum Au1, Christopher Nason1, Simin Kandemir1, and Donald R. Peterson1
1Texas A&M University-Texasville, Texarkana, TX
FRI-23 Affordable Stabilizing Electric Toothbrush for Improving Dental hygiene in Populations Lacking Fine Motor Control
Than Huygi1, Alexander Hanzen1, Parul Agrawal1, Ian Tangel1, Cody Golden1, Aditya Kishore1, Albert Li1, Cynthia Liu1, James Hui1, and Brett Whitley1
1University of Illinois Urbana-Champaign, Urbana, IL
FRI-24 Sandwich PDMS Membrane Device for HIV Virus Capture and Concentration Test
Yi Wang1, Keely Heston1, Kieren Conner1, and Xuanhong Cheng1
1Lehigh University, Bethlehem, PA

Track: Device Technologies and Biomedical Robotics
BIOSOPT
FRI-25 Carbon Nanospikes and Vertically Aligned Carbon Nanofibers for Biosensing Applications
Aysha Shanta, Khondaker Mamun1, Ava Hedayatipour1, Syed Islam1, and Nicole McFarlane1
1The University of Tennessee, Knoxville, TN
FRI-26 Investigating Aqueous-Ion Liquid Interfaces towards Developing Wearable Biosensors
Badrinarth Jagannath1, Sivram K Mathukuma2, Rajuta Mun1, and Shashidhar Prasad1
1University of Texas at Dallas, Richardson, TX, 2EnLiSense LLC, Afler, TX
FRI-27 Measuring Volume Status and Recovery in Exercising Patients
Costy Speros1, Paul Hart1, Bret Alex1, Franz Baudenbacher1, Kyle Rudge1, Susan Eagle1, and Colleen Brophy1
1Vanderbilt University, Nashville, TN
FRI-28 Point of Care Sensor for Cardiovascular Disease
David Probst1, Chi Lin1, Aldo Maloc1, and Jeffrey LaBelle1
1Arizona State, Chandler, AZ, 2Arizona State, Tempe, AZ
FRI-29 Point-of-care Sensor for the Detection of the Human Papillomavirus Using Cell-free DNA in Saliva
David Probst1, Christina Salas1, Jake Turner1, Chi Lin1, Jeffrey LaBelle1, and Barbara Smith1
1Arizona State, Tempe, AZ
FRI-30 Design and Analysis of an Optical Cavity Based Biosensor using Distributed Bragg Reflectors
Donggee Rho1 and Seunghyun Kim1
1The University of Tennessee, Knoxville, TN
FRI-31 A Nano-Calorimetry Based Platform for Point of Care ThermometricELISA
Evan Kacar1, Igor Gie1, Ray Mernaugh1, and Franz Baudenbacher1
1Vanderbilt University, Nashville, TN, 2Vanderbilt University Medical Center, Nashville, TN
FRI-32 A Bio-impedance Monitor for Fast Non Invasive Measurement of Hydration Status and Edema
Fred Dyer1, Jaquel Attey1, Murray Turner1, and Barry Bawa1
1LV Lab, Tewksbury, MA
FRI-33 Rapid DUA Swab Swap for THC Detection
Hunter Stevenson1, Shalini Prasad1, and David Kinnamon1
1University of Texas at Dallas, Richardson, TX
FRI-34 An Electrochemical Biosensor System for Chemical Imaging of Live Biological Samples with High Spatiotemporal Resolution
Jasmine Neel1, William Tidje1, Rachel Feeny1, Luke Schweinfurth1, Chad Ettel1, Stuart Tidje1, Charles Henry1, and Thomas Chen1
1Colorado State University, Fort Collins, CO
FRI-35 Giant Magnetoresistive Detection for the Quantitative Lateral Flow Immunoassay
Jongmin Park1
1Kyungil University, Gyeongsan, Korea, Republic of
FRI-36 Development of a Paper-based Diagnostic Platform For The Detection Of Diarrhea Causing Pathogens
Kshitij Ranjan1, Zhengyan Lu1, and Shannon Weigum1
1Texas State University-San Marcos, San Marcos, TX
FRI-37 Toward the Development of a Point-of-Care Diagnostic Technology for Dry Eye and Ocular Disorders
Malaketa Hossain1, Chi Lin1, Andrew Permar1, Marcus Smith1, and Jeffrey LaBelle1
1Arizona State University, Tempe, AZ, 2Advanced Tissue Diagnostics, LLC, Birmingham, AL
FRI-38 Rapid On-chip Protein Biomarker Detection and Data Mining Analysis for Chronic Kidney Disease Assessment
Maii Dong1, Jiandong Wu2, Zimin Ma2, Hagit Peretz-Soroka2, Michael Zhang1, Paul Komenda1, Nareepat Tang1, Yang Liu1, Claudio Rigotto1, and Francois Liri3
1University of Applied Technology, Hefei Institutes of Physical Science, Chinese Academy of Sciences, Hefei, China, 2People’s Republic of China, 3University of Tennessee, Knoxville, TN
FRI-39 Differential ISFET Based pH Sensing
Moi Shawki1 and Noemie Molinard1
1University of Tennessee, Knoxville, TN
FRI-40 Novel MEMS Device for Rapid Detection of MRSA
Nicole Rapp1, Alice Pastore1, Amanda Bakr1, Kristin Tingley1, Sally Ungar1, Gregory Aunger1, Theresa Bou-Ali1, Maneesh Nasa1, and Yewen Li1
1Laurence Thompson University, Southfield, MI, 2Wayne State University, Detroit, MI, 3Ascension-St. John Providence, Southfield, MI
FRI-41 On-chip and Label-free Glucose Sensing Using Mid-Infrared Waveguides
Pan Liu1
1Texas A&M University, College Station, TX
FRI-42 Pupillary Device Design for Ocular Cranial Nerve Monitoring
Rheagan Chambers1, Hannah Burton1, G. Michael Lemole Jr1, and Marek Ramanoski1
1University of Arizona, Tucson, AZ
FRI-43 Towards Surgical Margin Assessment with MicroEndoscopic Electrical Impedance Sensing
Ryan Halter1, Aditya Mahara1, Elias Hayashi1, and Jason Pettus2
1Dartmouth College, Hanover, NH, 2Dartmouth Hitchcock Medical Center, Lebanon, NH
FRI-44 Portable Affordable Bionanosensor for DNA Hybridization
Samuel Olpp1, Sohini Kar1, Shawn Penal3, Sethan Jasti1, and Sasan Splain
1University of New Haven, West Haven, CT, 2Saratoga High School, Saratoga, CA, 312-15 Molecular Diagnostics LLC, Branford, CT
FRI-45 Fabrication of Gold Nanorod Vertical Array and its Role in Fluorescence Intensity Enhancement
Sharon Kar1 and Lieng Tang1
1University of Texas at San Antonio, San Antonio, TX
FRI-46 A Rapid Paper-based Spot Test for Direct Detection of E. coli O157:H7 in Milk
Shuang Chen1, Tony Ye1, Nigolun Wu1, Elizabeth Gomez1, Zafe Arafad1, and Daniel Kamei1
1UCLA, Los Angeles, CA, 2University of Southern California, Los Angeles, CA
FRI-47 Dehydrated Aqueous Two-Phase Components
Improving Paper-Based Hb Detection in Serum
So Youn Lee1, David Penera1, Chinh Wu1, Benjamin Wu1, and Daniel Kamei1
1University of California, Los Angeles, Los Angeles, CA
FRI-48 Hand Movement Pattern Recognition Using Surface Electromyography and BP Neural Network Machine Learning Algorithm
Yang Zhao1, Changyang Chen1, Biao Chen1, Xinwu Zhang1, Young-Ah Shin1, Bo Cheng4, Mark Cheng1, and John Cavanaugh1
1Wayne State University, Detroit, MI, 2Shanghai Jiaotong University, Shanghai, China, 3People’s Republic of China, 4Capital Medical University, Beijing, China, People's Republic of China

Poster Viewing with Authors & Refreshment Break | 9:30 am—10:15 am and 2:45 pm—3:30 pm
Friday, October 13 | 9:30 am–5:00 pm | Exhibit Hall 300 North
Poster Viewing with Authors & Refreshment Break | 9:30 am–10:15 am and 2:45 pm–3:30 pm
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BMES 2017 Phoenix BMES 2017
**Track: Device Technologies and Biomedical Robotics**

**Sensors and Wearable Devices**

**FRI-50** Testing the Accuracy of Wearable Heart Rate Monitors in a Diverse Population
Quynh Ho1, Vanessa Oyston, Chelsi Vining1, and Alessandro Bellofatto1
1San Jose State University, San Jose, CA
2University of California, Los Angeles, Los Angeles, CA

**FRI-51** Wax Transfer-Printing-Based Fabrication of Cloth Electrochemical Sensors
Corey O’Donnell1, and Elan Fu2
1Oregon State University, Corvallis, OR
2Carnegie Mellon University, Pittsburgh, PA

**FRI-52** A Wearable and Cost Effective Brain-Computer Interface to Assay Device
Devidhe Marzah1 and Hananeh Esmailbeigi1
1University of Illinois at Chicago, Chicago, IL
2Ezlife Biotechnology Co., Ltd, Beijing, China, People’s Republic of China

**FRI-53** A Customizable Tongue Controlled Assistive Device
Kevin Kert1, Nicholas Marjanovic1, Ricardo Aranada1, Ernesto Biermann1, and Hananeh Esmailbeigi1
1University of Illinois at Chicago, Chicago, IL
2Ezlife Biotechnology Co., Ltd, Beijing, China, People’s Republic of China

**FRI-54** Chip-Scale and Label-Free Biomolecular Sensors Using Mid-Infrared Aluminum Nitride Waveguides
Pan Lin1
1Texas A&M University, College Station, TX

**FRI-55** Towards the Design of a Soft Robotic Third Arm for Assisted Living Tasks
Pham Nguyen1 and Panagiotis Polygerinos1
1University of Illinois at Chicago, Chicago, IL
2Ezlife Biotechnology Co., Ltd, Los Angeles, CA, 2Ezlife Biotechnology Co., Ltd, Beijing, China, People’s Republic of China

**FRI-56** Microneedles for Wearable Sensing and Interstitial Fluid Collection
Philip Miller1
1San Diego National Labs, Albuquerque, NM

**FRI-57** Toward Securing LoT-based Medical Devices
Sarat Chakrabarti1 and Olivia Czap1
1University of Portland, Portland, OR

**Track: Sensors Using Mid-Infrared Aluminum Nitride Chip-Scale and Label-Free Biomedical Devices**

**FRI-58** Analysis of Bilary Stent Using Abague
Aaron Van Gorkom1, Gregg Gillespie2, Clifford Howard Jr1, and Philip Brown3
1Biomedical Engineering, Wake Forest Baptist Health, Winston-Salem, NC
2Wake Forest University Baptist Medical Center, Winston-Salem, NC

**FRI-59** Development of the Digitally Adjustable Phrenic Nerve Stimulator
Alessa Frizzi1, Emma Orte1, Michelle Wang1, Kirby Gong1, Matthew Glucksberg1, and Debra Weese-Mayer1
1Northwestern University, Evanston, IL, 2Cure Children’s Hospital, Chicago, IL

**FRI-60** Enhanced Speech Perception Under Noisy Conditions using an Optimized Cochlear Implant Stimulation
Andrew Lai1, Jing2, Daniel Aguiar1, and Thomas Talavage1
1Purdue University, West Lafayette, IN

**FRI-61** The Development of a Novel Inserter for the InnFocus MicroShunt
Ash L1, Eudras Aranada1, Nidhi Bhatia1, Yasashi Kato1, John Martin1, Jean Marie Pan2, and Leonard Pincus1
1InnFocus Inc., Miami, FL, 2Ophthalmic Biophysics Center, Barcom Palmer Eye Institute, University of Miami Miller School of Medicine, Miami, FL

**FRI-62** Osmotic Transport Device to Alleviate Tissue Swelling Following Spinal Cord Injury
Christopher Hale1, Jennifer You1, Devlin Binder1, and Victor Rodrigues1
1UC Riverside, Riverside, CA

**FRI-63** Impact of Bifurcation Dual Stenting on Endothelial Shear Stress
Henry Chen1, Ben Kwon Koo1, and Ghassan Kassab1
1California Medical Innovations Institute, San Diego, CA, 2Division of Cardiology, Seoul National University Hospital, Seoul, Korea, Republic of Korea

**FRI-64** Characterization of a Bioprosthetic Bicuspid Venous Valve Hemodynamics: Implications for Mechanism of Valve Dynamics
Haoyi Chen1, Wei-hsun Tien2, and Ghassan Kassab1
1California Medical Innovations Institute, San Diego, CA, 2University of Washington, Seattle, WA

**Track: Medical Devices and Implantable Electronics**

**FRI-65** Anti-biofouling Microtubes for Glaucoma Drainage Devices
Hyunsoo Park1, Simon John2, and Hyowon Lee2
1Cleveland Clinic, Imaging and Therapeutics Engineering, Mack NanoTechnology Center, Artificial Implantable Devices, Purdue University, West Lafayette, IN, 2Howard Hughes Medical Institute, Jackson Laboratory, Bar Harbor, ME

**FRI-66** An Ex Vivo Study of an Inductively Powered Remote-Controlled Miniature Pacer
Panna Aks1, Rene Packard1, Yichen Ding1, Alexsia Yousef1, Dejar Markov1, and Tsung Hsia1
1University of California, Los Angeles, Los Angeles, CA

**Track: Track: Biomechanics, Device Technologies and Biomedical Robotics**

**Advances in Biomechanical Testing of Medical Devices**

**FRI-70** Device Technologies and Testing of a Novel Fastening Device for Adolescent Scoliosis Braces
Chloe Chung1, Derek Kelly2, Tareq Tare3, Eddy Beaman1, and Denis Doughty1
1University of Tennessee Health Science Center, Memphis, TN
2Wichita State University, Wichita, KS
3Center for Orthotics and Prosthetics, Inc., Memphis, TN

**FRI-71** Use of a Novel, Clinically Relevant Ex Vivo Model to Study the Prophylactic Use of Foam Dressings to Redistribute Pressure
Elizabeth Smith1, George Scaroni1, and Abram Jani1
1Hollister Incorporated, Libertyville, IL

**FRI-72** Validation of MicroCT Based Bone Bending Device
Kyle Bodnyk1 and Richard Hart1
1The Ohio State University, Columbus, OH

**FRI-73** Fastenssco Laser Micromachining, Fabrication and Alignment of Circular Microtubes in Hydrogels
Carsten Conrad1 and David Long2
1University of Auckland, Auckland, New Zealand, 2Wichita State University, Wichita, KS

**FRI-74** Tunable Electrochemical Impedance Spectroscopy - Factors Affecting the Optimal Frequency
Chi En Li1, David Probst1, and Jeffrey Labella1
1Arizona State University, Tempe, AZ

**FRI-75** Microengineered Cell Compression Device for Studying Chondrocyte Mehanobiology
Donghee Lee1, Aliki Erickson1, Andrew T. Dudley1, and Sangin Ryu1
1University of Nebraska-Lincoln, Lincoln, NE, 2University of Nebraska Medical Center, Omaha, NE

**FRI-76** Design of a Pumpless Microfluidic Chip for Blood Analysis Using Modified Silicone
Kokou Serge Dagbia1, Bryan Khi Ng1, Melissa Grunlan1, and George Bigelow1
1Texas A&M University, College Station, TX

**FRI-77** High-precision Microtissue Surrogate by the Measurement of Preservation Length with Sub-pixel Resolution
Naeiro Isaza1, Karuki Uchit1, Hiroshi Shiotani1, Hideakhi Kotera1, Tatsuru Hashiba1, Jennifer Ross2, and Ryoji Yokokawa1
1Kyoto University, Kyoto, Japan, 2University of Wisconsin–La Crosse, La Crosse, WI, 3University of Massachusetts–Amherst, Amherst, MA

**FRI-78** Engineered Biomimetic Glomerular Membrane: Effects of Stiffness on Podocyte Culture
Eilyr Jones1, Matthew Ishiak1, Alessia Fornoli1, and Ashutosh Agrawal1
1University of Miami, Miami, FL

**FRI-79** Suppression of Fibrosis in Glaucoma Surgery Using an Innovate Microfluidic Meshwork
Fei He1, Saharh Amstutz1, Stanford Wei1, Hong Hu1, Michale Bloomer1, Zhengguo Zhao1, Paul Cohn1, Lan Luan2, Ying Han1, and Chong Xie1
1The University of Texas at Austin, Austin, TX, 2University of California, San Francisco, CA

**Track: Biomaterials, Nano and Micro Technologies**

**Integration of Biomaterials with Chips and Devices**

**FRI-80** Anti-biofouling Microtubes for Glaucoma Drainage Devices
Hyunsoo Park1, Simon John2, and Hyowon Lee2
1Cleveland Clinic, Imaging and Therapeutics Engineering, Mack NanoTechnology Center, Artificial Implantable Devices, Purdue University, West Lafayette, IN, 2Howard Hughes Medical Institute, Jackson Laboratory, Bar Harbor, ME

**FRI-81** An Ex Vivo Study of an Inductively Powered Remote-Controlled Miniature Pacer
Panna Aks1, Ren Packard1, Yichen Ding1, Alexsia Yousef1, Dejar Markov1, and Tsung Hsia1
1University of California, Los Angeles, Los Angeles, CA

**FRI-82** Device Technologies and Testing of a Novel Fastening Device for Adolescent Scoliosis Braces
Chloe Chung1, Derek Kelly2, Tareq Tare3, Eddy Beaman1, and Denis Doughty1
1University of Tennessee Health Science Center, Memphis, TN
2Wichita State University, Wichita, KS
3Center for Orthotics and Prosthetics, Inc., Memphis, TN

**FRI-83** Use of a Novel, Clinically Relevant Ex Vivo Model to Study the Prophylactic Use of Foam Dressings to Redistribute Pressure
Elizabeth Smith1, George Scaroni1, and Abram Jani1
1Hollister Incorporated, Libertyville, IL

**FRI-84** Validation of MicroCT Based Bone Bending Device
Kyle Bodnyk1 and Richard Hart1
1The Ohio State University, Columbus, OH

**FRI-85** Fastenssco Laser Micromachining, Fabrication and Alignment of Circular Microtubes in Hydrogels
Carsten Conrad1 and David Long2
1University of Auckland, Auckland, New Zealand, 2Wichita State University, Wichita, KS

**FRI-86** Tunable Electrochemical Impedance Spectroscopy - Factors Affecting the Optimal Frequency
Chi En Li1, David Probst1, and Jeffrey Labella1
1Arizona State University, Tempe, AZ

**FRI-87** Microengineered Cell Compression Device for Studying Chondrocyte Mehanobiology
Donghee Lee1, Aliki Erickson1, Andrew T. Dudley1, and Sangin Ryu1
1University of Nebraska-Lincoln, Lincoln, NE, 2University of Nebraska Medical Center, Omaha, NE

**FRI-88** Design of a Pumpless Microfluidic Chip for Blood Analysis Using Modified Silicone
Kokou Serge Dagbia1, Bryan Khi Ng1, Melissa Grunlan1, and George Bigelow1
1Texas A&M University, College Station, TX

**FRI-89** High-precision Microtissue Surrogate by the Measurement of Preservation Length with Sub-pixel Resolution
Naeiro Isaza1, Karuki Uchit1, Hiroshi Shiotani1, Hideakhi Kotera1, Tatsuru Hashiba1, Jennifer Ross2, and Ryoji Yokokawa1
1Kyoto University, Kyoto, Japan, 2University of Wisconsin–La Crosse, La Crosse, WI, 3University of Massachusetts–Amherst, Amherst, MA

**FRI-90** Engineered Biomimetic Glomerular Membrane: Effects of Stiffness on Podocyte Culture
Eilyr Jones1, Matthew Ishiak1, Alessia Fornoli1, and Ashutosh Agrawal1
1University of Miami, Miami, FL

**FRI-91** Suppression of Fibrosis in Glaucoma Surgery Using an Innovate Microfluidic Meshwork
Fei He1, Saharh Amstutz1, Stanford Wei1, Hong Hu1, Michale Bloomer1, Zhengguo Zhao1, Paul Cohn1, Lan Luan2, Ying Han1, and Chong Xie1
1The University of Texas at Austin, Austin, TX, 2University of California, San Francisco, CA
**POSTER SESSION—FRIDAY**

**Friday, October 13 | 9:30 am–5:00 pm | Exhibit Hall 300 North**

**Poster Viewing with Authors & Refreshment Break | 9:30 am–10:15 am and 2:45 pm–3:30 pm**

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**FRI-80**

**Polymer Morphology Influences Electronic Properties of Polyamidine-Chitosan Nanocomposites**

John A. Gregg1, Jun-Jin Huang1, Tallie A. Davis2, and Anthony Guiseppe Elia1,3,3

1Center for Bioelectronics, Biosensors, and Biochips (C 3B), Texas A&M University, College Station, TX; 2Artie McFerrin Department of Chemical Engineering, Texas A&M University, College Station, TX

**FRI-81**

**Graphene Patterned Microchip for Colorectal Cancer Detection**

Kasaya Hemann1, Shrihari Singh1, Sanjay Robbani Karimabadi1, Babu1, Isaac Meenan1, and Prabir Patna1

1University of Bridgeport, Bridgeport, CT

**FRI-82**

**Efficient Designing of High-performance Biomarker Assays using Computational Modeling**

Mahsa Dabagh1, Carmel Fortuna1, Daniel Jif1, Rohan Athar1, John Gourley1, Arvind Husain1, Ashutosh Chilkoti1, and Amanda Randel1

1Duke University, Durham, NC

**FRI-83**

**In Vitro Recapitulation of the Dysfunctional Neuromucosal Junction in Charcot-Marie-Tooth Disease**

Rachel Besser1, Matthew Ishahak1, Ellen James1, Renata Marcel1, Marvin Sapor1, and Ashutosh Agarwal1

1University of Miami, Miami, FL

**FRI-84**

**Microfluidic System for Assessing Myoblast Migration Behavior in Co-culture System**

Rahul A. Ayarmaram1, Nareen Almeida1, Bryan J. Black1, David W. Schendel1, and Joseph J. Parenteau2

1University of Texas at Dallas, Richardson, TX

**FRI-85**

**Iron Oxide Nanoparticle Based T-cell Tracking on Hybrid Microfluidic Paper-based Systems via Electro-Kinetic Forces**

Daniel Baughman1, Julia DeBelly1, Joshua Kline1, Anne Mammel1, Seyedhamidreza Alaie1,2, Sanlin Robinson1,2,3, Amir Ali Amiri1,2,3, Seyedhamidreza Alaie1,2,3, Amir Ali Amiri1,2,3, and Naren Vyavahare1,2,3

1University of California, Irvine, Irvine, CA, 2California Institute of Technology, Pasadena, CA, 3Binghamton University, Binghamton, NY

**FRI-86**

**Design Optimization of Dual Nanoparticle Delivery for Enhanced Cancer Treatment**

Marc M. Charest-Daniele1 and Michael Kokkolaras1

1McGill University, Montreal, QC, Canada

**FRI-87**

**Aptosis Induction by Functionalized Fullerenes-based Ultrasound Sonodynamic Therapy in HL-60 cells**

Nagshahi Yilmaz1, Yumbla Ismail1, and Nasir Koyi1

1Yokohama University of Pharmacy, Yokohama, Kanagawa, Japan; 2University of Texas at El Paso, El Paso, TX

**FRI-88**

**Nanochannel Delivery System for Controlled Release of Ocular Drugs to Target Increased Intracuticular Pressure**

Priya Jain1, R. Julie Hool1, Andrea Ballaini1, Giacomo Bruno1, and Alessandro Grottini1

1Houston Methodist Research Institute, Houston, TX; 2University of Texas at San Antonio, San Antonio, TX; 3Politecnico di Torino, Turin, Italy

**FRI-89**

**Development of Targeted Nanoscale Drug Delivery System for Osteoarthritic Cartilage Tissue**

Tao Jiang1, Komal Ruparel1, Ho Man Kien1, Enca Komal1, Yingyue Li2, and Kevin Li3

1UCanr Health, Farmington, CT; 2University of Hartford, West Hartford, CT

**FRI-90**

**Enzyme-Loaded Poly(lactic-co-glycolic acid) Nanoparticles as Anti-biofilm Treatment Strategy for Biofilm Infections**

Chendong Han1, James Goodrame1, Kerin Sauer1, and Amber Dorrison2

1State University of New York at Binghamton, Vestal, NY

**FRI-91**

**Biomimetic Anisotropic Platelet Membrane Coated Particles for Enhanced Drug Delivery and Wound Healing**

Elena Ben-Avros1, Randall Meyler1, Jonathan Smith1, Drew Pardo1, and Jordan Green1

1Johns Hopkins University, Baltimore, MD

**FRI-92**

**Sustained Delivery of 1,25-dihydroxyvitamin D3 for Endogenous Antimicrobial Peptide Induction**

Jingwei Xie1, Jiang Jiang1, Shixuan Chen1, and Hongjun Wang1

1University of Nebraska Medical Center, Omaha, NE

**FRI-93**

**Injectable Multidrug Delivery Hydrogel for Postoperative Management of Ocular Surgery**

Mazar Mohammadi1,2,3, Nisha Hallingworth4, Cagri Besirli1, Ronald Laster1, and Jordan Green1

1University of Michigan, Ann Arbor, MI; 2University of Michigan, Ann Arbor, MI; 3University of Nebraska Medical Center, Omaha, NE

**FRI-94**

**Drosophila Melanogaster as a Model for the Delivery of Protein Based Nanoparticles Through the Blood-Brain Barrier**

Michael Farhi1, Samantha Hirji1, Kyung-An Han1, and Thomas Boldal1

1University of Texas at El Paso, El Paso, TX

**FRI-95**

**Greater than 24 Hour Sweat Stimulation by Iontophoretic Delivery of Carboxyl For Continuous Biosensing**

Philip Stevens1, Kevin Li1, Gerald Kasting1, and Jason Heikenfeld1

1University of Cincinnati, Cincinnati, OH

**FRI-96**

**Targeting of Nanoparticles to Degraded Elastin in an Angiotensin II Abdominal Aortic Aneurysm Model**

Xiaoying Wang1, Naom Nisso1, Sahel Karamched1, Adis Sinha1, and Renato Vyas1

1Clemson University, Clemson, SC; 2Wright State University, Dayton, OH; 3Amgen Inc., Thousand Oaks, CA

**Track: Nano and Micro Technologies**

**FRI-97**

**Nanobicromic Coatings to Prevent Bacterial Contamination and Biofilm Formation in Dental Unit Waterlines**

Anash Ali1, Jing Yang Shin1, Tao Tao1, Junjie Zhu1, Kerin Sauer1, and Junghyung Choi1

1W Biomedical, Bedford, MA; 2Binghamton University, Binghamton, NY; 3Binghamton University, Binghamton, NY

**FRI-98**

**White Blood Cell Separation on Hybrid Membrane-Based Systems via Electro-Kinetic Forces**

Daniel Baughman1, Julia DeBelly1, Joshua Kline1, Anne Mammel1, Seyedhamidreza Alaie1,2, Sanlin Robinson1,2,3, and Naren Vyavahare1,2,3

1University of California, Irvine, Irvine, CA, 2California Institute of Technology, Pasadena, CA, 3Binghamton University, Binghamton, NY

**FRI-99**

**Development Micromixing Software Based on Particle-tracking Algorithms**

H.A. Betancourt Cervantes1, Hector R. Siller1, and Casillo1

1University of Texas at San Antonio, San Antonio, TX, 2UConn Health, Farmington, CT

**FRI-100**

**Characterization of a Nanoscale Electroporation Aneurysm Model**

Priya Jain1, R. Lyle Hood2, Andrea Ballerini1, Giacomo Bruno1,3, and Jordan Green1

1University of Michigan, Ann Arbor, MI, 2Johns Hopkins University, Baltimore, MD

**Track: Nano and Micro Technologies**

**Advances in Micro/Nano Manufacturing**

**FRI-101**

**Improvement of Dry and Wet Adhesion in Parylene C Microdevices**

Jessica Ortizgoa-Diaz1, Kiei Scholten1, and Ellis Meng1

1UC, Los Angeles, CA

**FRI-102**

**A Novel Route for Generation of 3D Nanofiber Scaffolds**

Jungseok Kang1,2,3, Shishu Chen1, and Hongjun Wang1

1University of Nebraska Medical Center, Omaha, NE

**FRI-103**

**Co-Culture Membranes with Tunable Nanoscale Sizers to Selectively Control Cell-Cell Communication**

Marcela Mireles Ramirez1, Costy Souly1, Robert Carter1, Stephanie Castillo1, and Thomas Gaborski1

1Rochester Institute of Technology, Rochester, NY

**FRI-104**

**Surface Modification of Medical Devices using Microfabrication Techniques**

Sayyedhamideh Hammad1,2,3, Athan Rosim1, Amir Ali Amiri1,2,3, Mohammad Reza Moghader1,2,3, Jordin Auger1, James Min1,2,3, and Simon Doueks4

1Weill Cornell Medicine, New York, NY; 2New York Presbyterian Hospital-Weill Cornell Medicine, New York, NY; 3Cornell University, Ithaca, NY

**FRI-105**

**Femtosecond Laser Micro-processing of Gelatin Methacrylate Hydrogel**

Zheng Xiong1,2, Puskar Kumar1,2, Yin Zhu1,2, Rafael Ramon3, and Prasad Somani4

1Syracuse University, Syracuse, NY; 2Syracuse Biomaterials Institute, Syracuse, NY

**FRI-106**

**Integration of Droplet Digital PCR Assay for Microbial Detection on Centrifugal Microfluidic Disc**

Hamsa Gopalan1, Kazi Huang1, Horacio Kiko2, Michael Hoffman2, Marc Madou3, and Sunny Jeng4

1University of California, Irvine, Irvine, CA, 2California Institute of Technology, Pasadena, CA

**Track: Nano and Micro Technologies**

**Advances in Pathogen Detection**

**FRI-107**

**Integration of Droplet Digital PCR Assay for Microbial Detection on Centrifugal Microfluidic Disc**

Hamsa Gopalan1, Kazi Huang1, Horacio Kiko2, Michael Hoffman2, Marc Madou3, and Sunny Jeng4

1University of California, Irvine, Irvine, CA, 2California Institute of Technology, Pasadena, CA
Track: Nano and Micro Technologies—Other/Non-Specified

FRI-107 An Electrochemical Impedance Based Sensor for Rapid Detection of Iron Deficiency and Anemia
Hongjun Song1, Jeme Rosano1, Charles Girvin1, Katherine Marschner1, Balakshador Prabhakaran2, and Kapil Pant1
1CFO Research Corporation, Huntsville, AL

FRI-108 Enhancement of Molecular Reactions Achieved by a Cell–phone–powered Acoustofluidic Pump
Pin-Hao Huang1, Hunter Bachman1, Shujie Yang1, Pernan Zhang1, and Tony Juni Huang1
1Duke University, Durham, NC

FRI-109 Electric Field-Assisted Protein Fractionation by Charged Ultrafiltration Membranes
Raymond Yeung1, David Jayasuriya1, and Victor Rodgers1
1University of California, Riverside, Riverside, CA

FRI-110 Fabric Based Biosensing for Cortisol Lifestyle Monitoring
Saray Ukkusitala Ambakaila Tan1, Badrinath Jagannath1, and Shalmi Prasad1
1The University of Texas at Dallas, Richardson, TX

FRI-111 A Multiscale Device for the Study of Compartmentalized Purinergic Signaling
Sean McCutcheon1, Robert Majeska1,3, Serge Cremers1, Henry Ginsberg1, and Kam Leong1
1University of California, Irvine, Irvine, CA

FRI-112 A Novel Microfluidic Technique for Measuring Surface Expressions of 2D Binding Affinity of Proteins
Tanmay Ghorai1, Amanpreet Garg1, Enrique Valera1, Carola Pagan Diaz1, Greg Damholt1, Jacob Berger1, and Restrict Bashe
1University of Illinois at Urbana Champaign, Urbana, IL

FRI-113 Delivery of Controllable Hydrogen Sulfide Concentration via PDM Microfluidics for Biological Applications
Theodore Chandra1, Tom Driver1, Jesse Rahma1, and David Eddington1
1University of Illinois at Chicago, Chicago, IL

FRI-114 Enhanced Stochastic Fluctuations to Measure Steep Energy Landscapes with Atomic Force Microscopy
Todd Sulchek1, Ahmed Harder1, and Daniel Petter1
1Georgia Tech, Atlanta, GA

FRI-115 Ultrasensitive Detection of Secreted Proteins from Single Cells using Quantum Dots
Vanessa Herrera1, Seo-Chieh Joseph Hsu1, Mahi Rahim1, Wendy Lu1, and Jared Haut1
1University of California, Irvine, Irvine, CA

Track: Nano and Micro Technologies, Tissue Engineering

FRI-116 Tissue-Engineered Human Skeletal Muscle Models of Rheumatoid Arthritis
Catherine Oliver1, Brittany Davis1, James Hong1, Kim Huffman1, and George Truskey1
1Duke University, Durham, NC

FRI-117 Patient-Specific Liver Microtissues for Disease Modeling and Drug Screening
Dantong Huang1, Sarah Galbraith1, Srijani Chakraborty1,2, Hon Fai Chan1,2, Sreeni Srinivasan1, and Kam Leong1
1Columbia University, New York, NY, 2GlassSmithWire, Collegeville, PA

FRI-118 A Microfluidic Model of the Endosteat and Perivascular Niches of Bone Marrow
Drew Glass1, Natalie Ng1, Greg Foo1, Katherine Weibacher1, Dan Lee1, and Steven George1
1University of California, Davis, Davis, CA, 2Washington University, Saint Louis, MO

FRI-119 Brain-on-Chip: Central Nervous System and Blood Barrier Pathology
Elizabeth Wheeler1, David Soscia1, Erik Muhlen1, Nicholas Fischer1, and Anna Blevin1
1University of California, Davis, CA

FRI-120 Self-Assembly of Vascularized Tissue to Support Tumor Explants In Vitro
Nir Mai1, David Ben-Dor2, and Nir Mai1
1Massachusetts General Hospital/Harvard Medical School, Boston, MA, 2Mater Misericordiae University Hospital, Dublin, Ireland

FRI-121 A Donor-Specific Optogenetic 3D Model of Human Neuromuscular Junctions
Olale F. Vila1, Sebastian Uzel2, Stephen P. Ma1, Roger D. Kamm1, and Richard Link2
1University of California, Davis, Davis, CA, 2Washington University, St. Louis, MO

FRI-113 Dual-Valve Continuous Pressure Regulation System for Applications in Haptic Feedback for Robotic Surgery
Ahmad Jafar1, Jake Penzel1, and Warren Grundfest1
1University of California Los Angeles, Los Angeles, CA

FRI-122 A Gut Inflammation-on-a-Chip Emulating Dextran Sodium Sulfate-induced Inflammation in Mice
Wansung Shin1 and Hyung Jang Kim1
1The University of Texas at Austin, Austin, TX

FRI-123 Innovative 3D-Printed Methodology for Recapitulation of Biological Structure on a Chip
Wu Zhang1, Andrew Lamon1, Gregory Foye1, Ryan Sochil1, and William Berde1
1University of Maryland, College Park, MD

FRI-124 An Integrated Biometric Adipose Tissue Microchip
Yuting Chen1, Latha Ramalingam1, Jangi Wu1, Naime Moutaouakil1, and Wei Li1
1Texas Tech University, Lubbock, TX, 2Wuhan Institute of Technology, Wuhan, China, People’s Republic of China

FRI-125 A Beating Heart-on-a-Chip for the Generation of Functional Cardiac Micro-Tissues
Alberto Reddick1, Olaia F. Vila1,2, Marie Lemme1, Pasca Ochett1, Emanuele Gaudelli1,2, Emiliano Votto1, Giulia Cerino3, Anna Marsan13, and Marco Rasponi1
1Politecnico di Milano, Milano, Italy, 2University Basel, Basel, Switzerland, 3University Basel, Basel, Switzerland

FRI-126 Effect of Streptococcus mutans on Keratinocyte Barrier Function in an Oral Mucosa On-A-Chip
Benjamin Rahmi1, Dominic M. Padov1, Thinh Le1, Gili Kaufman1, Daniel R. Banek1, Xiaolong Luo1, and Christopher Ruda1
1The Catholic University of America, Washington, DC, 2ADA Foundation, Viledge Research Center, Georgetown, MD

Christopher Rahmi1, Dominic M. Padov1, Thinh Le1, Gili Kaufman1, Daniel R. Banek1, Xiaolong Luo1, and Christopher Ruda1
1The Catholic University of America, Washington, DC, 2ADA Foundation, Viledge Research Center, Georgetown, MD

FRI-128 Brain-mimetic 3D Microfluidic Co-culture Platform for Controlling Differentiation of Human Neural Stem Cells
Jin Kim1, Joosun Shin1, Jong Seung Lee1, and Seung-Woo Cho1
1The Catholic University of America, Washington, DC, 2ADA Foundation, Viledge Research Center, Georgetown, MD

FRI-129 Quantifying ROS Generation in Individual Living Pancreatic Islets Using a Fluorescent Optical Sensor and Microfluidic Device
Romario Regina1 and Jonathan Richrosky1
1University of Toronto, Toronto, ON, Canada

Track: Orthopedic and Rehabilitation Engineering, Device Technologies and Biomedical Robotics

FRI-130 The Variable Impedance Treadmill (VIT) for Robot-assisted Rehabilitation
Linda Fox1, Jeffrey Skidmore1, and Panagiotis Artemiad1
1Arizona State University, Tempe, AZ

Track: Device Technologies and Biomedical Robotics

FRI-131 Differential Response of -cells to Non-invasive Exogenous Electrical Stimulation
Andrew Edward1, Dennis Hoang1, Taejoung Min1, Caleb Lustram1, and Michael Chv1
1University of Texas at Arlington, Arlington, TX

FRI-132 Computational One-Way FSI Simulations of Retinal Tract force from Alcon ULTRAvit Probes
Yangting Ma1, Daniel Shahrizad1, Brian McDonell1, Paul Mws1, Olaia F. Vila1, and Fadi Sassi1
1Alcon Research, Ltd., Fort Worth, TX, 2Alcon Research, Ltd., Lake Forest, CA

Track: Device Technologies and Biomedical Robotics

FRI-133 Development of Thin Soft Actuators for Transcatheter Applications
Amir Ali Amiri Moghadam1,2, Seyedhamidreza Ali1, James K. Min1,2, Simon N. Dunham1,2, and Bobak Mosadegh1
1The University of Texas at Austin, Austin, TX, 2ADA Foundation, Viledge Research Center, Washington, DC, 3Massachusetts Institute of Technology, Cambridge, MA

FRI-134 Design of Soft Actuators for Transcatheter Applications
Aly Amri1, Ali Moghadam2, Seyedhamidreza Ali1, James K. Min1,2, Simon N. Dunham1,2, and Bobak Mosadegh1
1The University of Texas at Austin, Austin, TX, 2ADA Foundation, Viledge Research Center, Washington, DC, 3Massachusetts Institute of Technology, Cambridge, MA

FRI-135 Development of Smart Actuators for Transcatheter Applications
Ami Ali Amri1, Moghadam2, Seyedhamidreza Ali1, James K. Min1,2, Simon N. Dunham1,2, and Bobak Mosadegh1
1The University of Texas at Austin, Austin, TX, 2ADA Foundation, Viledge Research Center, Washington, DC, 3Massachusetts Institute of Technology, Cambridge, MA

FRI-136 Design of Thin Soft Actuators for Transcatheter Applications
Amir Ali Amri Moghadam1, Seyedhamidreza Ali1, James K. Min1,2, Simon N. Dunham1,2, and Bobak Mosadegh1
1The University of Texas at Austin, Austin, TX, 2ADA Foundation, Viledge Research Center, Washington, DC, 3Massachusetts Institute of Technology, Cambridge, MA

FRI-137 Design of Soft Actuators for Transcatheter Applications
Amir Ali Amri1, Moghadam2, Seyedhamidreza Ali1, James K. Min1,2, Simon N. Dunham1,2, and Bobak Mosadegh1
1The University of Texas at Austin, Austin, TX, 2ADA Foundation, Viledge Research Center, Washington, DC, 3Massachusetts Institute of Technology, Cambridge, MA

FRI-138 Design of Soft Actuators for Transcatheter Applications
Amir Ali Amri Moghadam1, Seyedhamidreza Ali1, James K. Min1,2, Simon N. Dunham1,2, and Bobak Mosadegh1
1The University of Texas at Austin, Austin, TX, 2ADA Foundation, Viledge Research Center, Washington, DC, 3Massachusetts Institute of Technology, Cambridge, MA

FRI-139 Design of Soft Actuators for Transcatheter Applications
Amir Ali Amri Moghadam1, Seyedhamidreza Ali1, James K. Min1,2, Simon N. Dunham1,2, and Bobak Mosadegh1
1The University of Texas at Austin, Austin, TX, 2ADA Foundation, Viledge Research Center, Washington, DC, 3Massachusetts Institute of Technology, Cambridge, MA

FRI-140 Design of Soft Actuators for Transcatheter Applications
Amir Ali Amri Moghadam1, Seyedhamidreza Ali1, James K. Min1,2, Simon N. Dunham1,2, and Bobak Mosadegh1
1The University of Texas at Austin, Austin, TX, 2ADA Foundation, Viledge Research Center, Washington, DC, 3Massachusetts Institute of Technology, Cambridge, MA

FRI-141 Design of Soft Actuators for Transcatheter Applications
Amir Ali Amri Moghadam1, Seyedhamidreza Ali1, James K. Min1,2, Simon N. Dunham1,2, and Bobak Mosadegh1
1The University of Texas at Austin, Austin, TX, 2ADA Foundation, Viledge Research Center, Washington, DC, 3Massachusetts Institute of Technology, Cambridge, MA
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FRI-135
Position Tracking System for Dental Patients during Cone Beam Computer Tomography (CBCT)
Cem Yala, Sinan Onal1, Selhyung Choi1, Cypri Pandarakalam1, Nathalia Garcia1, and Mohamed Derman1
Southern Illinois University Edwardsville, Edwardsville, IL

FRI-136
Non-Invasive Detection of Respiration and Heart Rate with Vehicle Seat Sensor
Grace Wasik1 and Hampton Gabler1
Virginia Tech, Blacksburg, VA

FRI-137
Mechanical Characterization of Medical Adhesive Tapes Used for Pediatric Nasogastric Tube Securement
Hannah Catull1, Aaron Rebold1, Hale Kirdal1, Ezra Alsaheb1, Jean Christopher1, and James Keszenheimer1
1The University of Akron, Akron, OH, 2Akron Children’s Hospital, Akron, OH

FRI-138
3D-Printed Microfluidic Device for the Analysis of Intestinal Tissue Ex Vivo
Ian McLean1, Charles Henry1, and Stuart Tobet1
Colorado State University, Fort Collins, CO

FRI-139
Investigating the Use of Structured Light Imaging for 3-D Reconstruction of the Human Forearm for Automated Vincipuncture
Josh Leipheimer1, Max Balter1, Alvin Chen1, Tim Maguire1, and Martin Yermish1
Temple University, Philadelphia, PA

FRI-140
Developing a Minimal Gut-Brain Axis with Genetically Engineered Cells and Robots
Keith Hoye1 and Warren Ruder1
Carnegie Mellon University, Pittsburgh, PA, 1University of Pittsburgh, Pittsburgh, PA

FRI-141
Design and Mechanics of Honeybee-inspired Surgical Needles
Mohammad Sahlabadi1, David Gardell1, Jonasan Younan Attia1, and Carrie Herman1
1University of Arizona, Tucson, AZ

FRI-142
Chemofilter Device Computational Modeling for Optimizing Heart Valve Replacements Resists Calcification
Antonio D’Amore1,3,4, and Denver Faulk2
1University of Alabama at Birmingham, Birmingham, AL, 2Intangisoft Technologies and Biomedical Robotics, Catalonia, Spain

FRI-143
Analysis of Expanded Polytetrafluoroethylene (ePTFE) Membranes for Use Within a Valved Conduit for Right Ventricular Outflow Tract Reconstruction
Abigail Loneker1,2, Arush Kalra2, Samuel Potter1, and Doug Bernstein2
1University of North Carolina at Chapel Hill, Chapel Hill, NC, 2University of Pittsburgh, Pittsburgh, PA

FRI-144
Effect of Short Exposure to High Shear on Smooth Muscle Cell Adhesion under Physiologic Conditions
Antonio D’Amore1,3,4, and Denver Faulk2
1University of Alabama at Birmingham, Birmingham, AL, 2Intangisoft Technologies and Biomedical Robotics, Catalonia, Spain

FRI-145
Novel Synthetic Biomaterial for Fabrication of Heart Valve Replacements Resists Calcification
Hobay Tam1 and Nayan Vyasvan2
Clemson University, Clemson, SC

FRI-146
Novel Electrocardiac Alignment System for Vascular Fistula Creation
Masamitsu Dia1, Sorin Popa1, and Robert Dickerson1
1The University of Texas at Austin, Austin, TX

FRI-147
Evaluation of a Flexible Cardiac Cryoablation Probe in Modified Porcine Thigh Muscle Preparation
Carris Herman1, Dannah Ratier1, Jacqueline Wendel1, Philip Schmidt1, Jeremy Dando1, Adam Carey1, Tamer Ibram1, and David Fransson1
1ArmCure, Minneapolis, MN, 2ArmCure, San Ramon, CA

FRI-148
Analysis of Expanding Polytetrafluoroethylene (ePTFE) Membranes for Use Within a Valved Conduit for Right Ventricular Outflow Tract Reconstruction
Abigail Loneker1,2, Arush Kalra2, Samuel Potter1, and Doug Bernstein2
1University of North Carolina at Chapel Hill, Chapel Hill, NC, 2University of Pittsburgh, Pittsburgh, PA

FRI-149
Analytical Methodology for 3D Reconstruction of the Human Forearm for Automated Vincipuncture
Josh Leipheimer1, Max Balter1, Alvin Chen1, Tim Maguire1, and Martin Yermish1
Temple University, Philadelphia, PA

FRI-150
Vagus Nerve Stimulation Improves Long-term Survival in Dahl Salt-Sensitive Hypertensive Rats
Elizabeth M. Annoni1, Duyan Van Helden1, T. Trinh2, Bruce H. Koons1, Kevin M. Johnson1, John W. Olson1, and Elena G. Taskaeva1
1University of Minnesota, Department of Biomedical Engineering, Minneapolis, MN, 2University of Minnesota, Department of Integrative Biology and Physiology, Minneapolis, MN, 3Cyberonics Inc., Houston, TX

FRI-151
Pharmacokinetic and Pathological Analysis of Local Liquid Delivery of Paclitaxel Via a Perfusion Cardiac Catheter
Emily Turner1, Megan Erani1, Marzeh Athig1, Uwe Christians1, and Saami K. Yazdani1
1University of South Alabama, Mobile, AL, 2IC2 Clinical Research and Development, University of Colorado, Aurora, CO

FRI-152
Development of Collector Tips for Proper Collection of Basal Tear Fluid with Minimized Eye Irritation
Yung-Chan Chou1, Seung Ho Lee1, Dong Yeon Nam1, Beom Kang Huh1, and Young Bin Choy1
1The University of Akron, Akron, OH, 2Temple University, Philadelphia, PA

FRI-153
Basal Tear Fluid with Minimized Eye Irritation and Hampton Gabler1
Virginia Tech, Blacksburg, VA

FRI-154
Evaluation of Hemodynamic Performance of Endovascular Chemoembolization Device
Nazarin Mazeri1, Daryl Year1, Michael Nosovskiy1, Julia Greer1, Sean Hetter1, and Vitaly Ras1
1University of Wisconsin-Milwaukee, Milwaukee, WI, 2California Institute of Technology, Pasadena, CA, 3University of California San Francisco, San Francisco, CA, 4Purdue University West Lafayette, IN

FRI-155
Novel Microfluidic Device to Monitor Blood Coagulation and Patient-Specific Response to Heparin/Protamine
Robin Santor1, William L.USE1, Benjamin Alonso1, Elizabeth Budiman1, Raymond Weng1, and Jeong-Yeol Yoon1
University of Arizona, Tucson, AZ

FRI-156
Nanomatrix Coated Stent Enhances Endothelialization and Reduces Platelet and Smooth Muscle Cell Adhesion under Physiologic Conditions
Grant Alexander1, Patrick Hewing1, Jeong-a Kim1, Brighta Brant1, Young-Sop Yoon1, and Ho-Young Jun1
1University of Alabama at Birmingham, Birmingham, AL, 2Emory University, Atlanta, GA

FRI-157
The Effect of Inflow Cannula Angle on Intraventricular Flow Field of the LVAD-Assisted Heart
Hossein Niazi1,2,3,4,5, Riccardo Montes1, Sanjaya Sakal1, and Karen May Newman1
1San Diego State University, San Diego, CA, 2University of Pennsylvania, Philadelphia, PA

FRI-158
Design of a Wireless Power System for Continuous Flow Pediatric Left Ventricular Assist Devices
Hajin Park1, Thomas Zuccardi1, Arabi Keshabi1, Tommy Khaml2, Andy Nguyen1, and John Valdovinos1
1California State University, Northridge, Northridge, CA

FRI-159
Simulation of Transcatheter Aortic Valve Deployment and Blood Flow in a Beating Heart
Kam Din2, Grant Alexander1, Dannah Reiter1, Jacqueline Wendel1, Philip Schmidt1, Karl O’Souza2, and Danny Bluestein2
1Story Bridge Brewery, Story Bridge, NY, 2qCSSat Systems Simula Corp, Aachen, Germany, 3qCSSat Systems Simula Corp, Johnston, RI

FRI-160
Effect of Mitral Valve Prosthesis Design and Orientation on Intraventricular Flow Transport Studied in a Mock Circulatory Loop
Ricardo Montes1, Riccardo Montes1, Willem Leonij2, Nicolas Marques1, Pablo Martinez-Legajo1, J. Bierma1, Juan Carlos del Alamo1, and Karen May Newman1
1San Diego State University, San Diego, CA, 2University of California, San Diego, La Jolla, CA, 3Hospital General Universitario Gregorio Maranon and Instituto de Investigacion Santiago Gregorios Maranon, Madrid, Spain, Madrid, Spain

FRI-161
Paper-Microfluidic Device to Monitor Blood Coagulation and Patient-Specific Response to Heparin/Protamine
Robin Santor1, William L. USE1, Benjamin Alonso1, Elizabeth Budiman1, Raymond Weng1, and Jeong-Yeol Yoon1
University of Arizona, Tucson, AZ

FRI-162
Detection of the Infrasonic Sounds Emitted from the Human Heart with a Novel Infrasonic Stethoscope
Rolando Valdez1, Kenjiro Akiyama1, Katherine H. Cooper1, and Qamar A. Shams2
1Caltech, Pasadena, CA, 2University of California, Los Angeles, CA

FRI-163
A Physiologically-Driven Biaxial Bioreactor System to Investigate Valve Interventricular Cell Phenotypic State after Surgical Repair
Salma Ayoub1, Samuel Potter1, Jordan Gravle1, and Michael Sacks1
1The University of Texas at Austin, Austin, TX
Aneurysms

Friday, October 13 | 9:30 am–5:00 pm | Exhibit Hall 300 North
Poster Viewing with Authors & Refreshment Break | 9:30 am–10:15 am and 2:45 am–3:30 pm

FRI-224 Alterations in Articular Biomechanics Due to Surgery Are Attenuated By Treatment with PEG Hydrogel
Kathryn Robinson1, Rebecca Scott1, Anne Heeke1, Edward Woodland1, Wally Arm1, Thomas Planchon1, Kristi Kirk1,2, and Robert Aiken1,2
1University of Mississippi, Oxford, MS, 2Vanderbilt University, Nashville, TN

FRI-225 Compression Effects on the Volumetric Flow Rate of Steady Flow Through Collapsible Tubes
Larry Griffl1, Cal Poly, St. Orvi, San Luis Obispo, CA

FRI-226 A Novel, Flow-Sensitive MicronRNA, miR-744, induces Endothelial Inflammation by Targeting LIMIS2 Rachel Simmons1, Dong Won Kang1, Sandeep Kumar1, and Ind stored
1University of California, Berkeley, CA

FRI-227 Radial Location and Local Reynolds Number in the Feed Determine Location and Fate of Particles in 25 um Diameter Eucalrcin
Samira Davash1 and Mary Framer1 Stony Brook University, Stony Brook, NY

FRI-228 Patient-based Model of Abdominal Aortic Aneurysm Wall Pressure and Stress
Touhid Ahmed1, Lisa Dorfman1, Robert Peatress1, and Erica Kimmeng1 Tufts University, Medford, MA, Tufts Medical Center Tufts University, Boston, MA

FRI-229 Mathematical Model of Abdominal Aortic Aneurysm Growth and Remodeling
Wenjun Li1, Mark Gifford2, Robert Peatress1, and Erica Kimmeng1 Tufts University, Medford, MA, Tufts Medical Center Tufts University, Boston, MA

FRI-230 Transient Aortic Blood Flow Modeling for Cardiovascular Risk Assessment in Turner Syndrome
Dhananjay Radhakrishnan Subramaniam1, Ephraim Gutman2, Christian Todd1, Naf Pariagrag1, Clara Gravath1, Kristin Mortensen1, Philipp Baecue2, and Iris Gutman-Litt1 University of Cincinnati, Cincinnati, OH, Aarhus University Hospital, Aarhus, Denmark, Great Ormond Street Hospital, London, United Kingdom, Cincinnati Children’s Hospital Medical Center, Cincinnati, OH

FRI-231 Towards Identifying Vortex Structures in Aneurysms
Ismael Pera1, Daniel Pulven1, Luis A. Hegele Jr1, John Gousley1, and Amanda Randel1 Duke University, Durham, NC

FRI-232 Optimization Based Vascular Growth and Remodeling Using Dual Splitting: The Collaboration Between Local and Regional Regulations
Jiahang Wu1 and Shawn C. Shaddix1 UCI, Berkeley, CA

FRI-233 Probing the Effects of Type-2 Diabetes on Vascular Endothelial Mechanics
Md. Mydul Islam1 and Robert Stewart Jr1 University of Central Florida, Orlando, FL

FRI-234 Baseline Sex Differences in Cardiac Metabolic Gene Expression Fade in Nonischemic Cardiomyopathy
Aaron Koppell1, Joshua Saxe1, and Igor Elmas11 The George Washington University, Washington, DC, 2Washington University School of Medicine, St. Louis, MO

FRI-235 A Novel Method to Characterize Spontaneously Beating Cardiomyocytes
Ankitha Shreedharan1, Brandon Raif1, and Jung Yi Lim1 University of Nebraska-Lincoln, Lincoln, NE

FRI-236 Blocking Cadherin-11 Decreases Plaque Burden in Atherosclerotic Mice
Camryn Johnson1, Matthew St. Jude1, and W. David Miresky1 Vanderbilt University, Nashville, TN

FRI-237 Zinc-sensing Receptor ZnR/GPR39 Mediates Zn-regulated Vascular Functions
Dongyu Zhu1, Yingbasu Su1, and Bingmei Fu21 The University of Texas, Denton, TX, 2The City College of the City University of New York, New York, NY

FRI-238 A Review of the Preoperative Risk Factors & Quantitative Variables Associated With Endoleak After Endovascular Aneurysm Repair
Jonathan Bellojoch1, Nicolette Papae1, Yue Liu1, and Vikki Hawley-Wood1 1Stevens Institute of Technology, Hoboken, NJ

FRI-239 The Role of Gut Microbiota in Cardiac Injury
Maria Piao1, John Khojasteh1, and Marvin Sippel1 University of Arizona, Tucson, AZ

FRI-240 Alteration of Oxytocin Neurons in Rat Model of Cardiac Pressure Overload Alters Expression of Myocardial Interleukin-1Beta
Mary Kate Deyer1, Karin Garret1, Hans-Olof Ovarenwall1, David Mendelsohn2, and Matthew Kay1 The George Washington University, Washington, DC

FRI-241 Using Novel Processing of Surface-Per-Articular Accelerometer Data to Calculate Pulse Transit Times and Pulse Wave Velocities
Natalie Camino1 and Charles Robinson1 1Clarkson University, Potsdam, NY

FRI-242 Study of the Development of Basement Membrane in Heart
Xiaoqian Yang1, Huaxia Yang1, Ramond Runyan2, Thomas K Borg1, and Eric Shane1 1Claremont University, Claremont, CA, 2University of Arizona, Tucson, AZ, 3Medical University of South Carolina, Charleston, SC

FRI-243 Cardiovascular Disease Prediction and Risk Factor Mining with RFMiner
Yas Xiao1 and Ruoqiang Fan1 Florida International University, Miami, FL

Track: Neural Engineering, Stem Cell Engineering

FRI-244 Autologous Bone Marrow Mononuclear Cell Treatment for Pediatric Traumatic Brain Injury Influences Circulating PUFA Levels and Inflammation
Charlotte Koe K. Wain1, Steven Kowarch1, Susan Sargent2, Floyd C. Chilton1, Charles S. Cox Jr1, and Elsbeth Rabkin1 Wake Forest School of Medicine, Winston-Salem, NC, University of Texas Dallas, Research Center at Houston, Houston, TX

FRI-245 Establishment of a Patient Biopsy-Derived Intestinal Model of Stem Cells and Intestinal Epithelial Stem Cells in Mice
Maren Puzan1, Caroline Ghor1, David Breedlo1, and Atigli Kopp2 1Northwestern University, Boston, MA, 2Boston Children’s Hospital, Boston, MA, 3Harvard Stem Cell Institute, Cambridge, MA

FRI-246 Characterizing Human Embryonic Stem Cells Function with Dielectrophoresis And Flow Cytometry
Taylorina Adlams1, Clarissa Ro1, Shubha Trai1, and Lisa Flanagan11 University of California Irvine, Irvine, CA

FRI-247 Interplay of Matrix Dimension and Electrical Stimulation in Engineering Human Neural Progenitor Cells for Stroke Recovery
Surya Rajan Selvam1, Alexa Levit1, Vivek Lall1, and Paul George1 1Stanford University, Stanford, CA

FRI-248 Investigating The Role Of PFG In Reprogramming Of Epidermal Keratinocytes Towards Neural Crest Fate
Georgios Tsampoulis1, Vivek Bagga2, Laura Kerous1, Kristie Cummings1, Samanesh Moghadam Baroughani1, Pedro Lei1, Surya Rajan Selvam1, Xiaoyan Wang1, Biao Liu1, Song Liu1, Gabriella K. Popadak1, Marianne Bronner1, and Sockets Andrews1 University at Buffalo, Buffalo, NY, 1Stanford School of Medicine, Stanford, CA, 2California Institute of Technology, Pasadena, CA, 3Roswell Park Cancer Institute, Buffalo, NY

FRI-249 An Integrated Miniature Bioprocessing For Personalized Human Induced Pluripotent Stem Cell Expansion And Differentiation Into Neural Stem Cells
Hae-Chang Lue1, Qiang Li1, and Yuan Lu1 University of Nebraska-Lincoln, Lincoln, NE

FRI-250 Using Bioengineering Approaches To Generate A Three-Dimensional (3-D) Human Induced Pluripotent Stem Cell (hiPSC)-Based Model Of Alzheimer’s&rsquo; Disease (AD)
Lee Bounds1 1Arizona State University, Tempe, AZ

FRI-251 Mimicking the In Vivo Characteristics of Human Neural Stem Cells with 3D NSC Microarrays
Pranav Joshi1, Kyeong Nam Yu1, Soo-Yeon Kang1, Chandranath Kothapalli1, and Moo-Youl Lee1 1Cleveland State University, Cleveland, OH

FRI-252 Oligodendrocyte Precursor Cell Hyperdendrity in a Mouse Model of Neurofibromatosis Type I Resembles Preneoplastic Lesions
Preeji Raghavan1, James Lennon1, and Michelle Monje-Deisseroth1 1Stanford University, Stanford, CA

FRI-253 High-Content Imaging Assays On 3D-cultural Neural Stem Cells for the Assessment of Neurotoxicity
Soo-Yeon Kang1, Pranav Joshi1, Kyeong Nam Yu1, and Moo-Youl Lee1 1Cleveland State University, Cleveland, OH

FRI-254 Progerin Induced Aging to Develop a Clinically Relevant in vitro Model of Alzheimer’s Disease
Sreenu Rama1 and David Brigham1 1Arizona State University, Tempe, AZ
Track: Biomaterials

FRI-255
Strain-Rate Dependent Elasticity of Lung Surfactant
Alex Thomas1 and Mark Borden1
University of Colorado, Boulder, CO

FRI-256
Development of a Humanized Mouse Model that Recapitulates the Fibrotic Response to Biomaterial Implants
Joshua Doolitt1, Ariah Sadras1, Shady Farah1, Rita Bortell1, Michael Brehm1, Dale Greiner1, Robert Langer1, and Daniel Anderson1
Massachusetts Institute of Technology, Cambridge, MA, Children’s Hospital, Boston, MA, University of Massachusetts Medical School, Worcester, MA

FRI-257
Assessing Drug Encapsulation Efficiency using Nanoparticle Tracking Analysis
Ragy Ragheb1 and Duncan Griffths1
Malvern, Westborough, MA

Track: Biomedical Imaging and Optics, Cardiovascular Engineering

FRI-258
Imaging in Cardiovascular Systems

FRI-262
Imaging based Left Atrial Appendage Shape Classification for Stasis Risk Stratification
Sharosh Sanathkumar1 and Prabhad Misra1
University of Pittsburgh, Pittsburgh, PA, Duquesne University, Pittsburgh, PA

FRI-263
Optical coherence tomography imaging to study cardiac tissue changes due to chemically induced edema
Tara Dib1, Shawn George1, Igor Efimov1, and Jason Zan1
The George Washington University, Washington, DC

FRI-264
Quantification of Myocardial Mechanics under Inotropic Stimulation using 3D cine DENSE CMR
Zhang Li1, Xiyan Zhang1, Gregory Walmsley1, David Powell1, Kenneth Campbell1, Brandon Formal1, and Jonathan Went1
University of Kentucky, Lexington, KY, Geisinger Health System, Danville, PA

FRI-265
Sarcormic Addition in a 3D in-vivo-like Neonatal Cardiomyocyte Culture under Mechanical Stretch
Zhonghai Wang1, Alikin Wei1, Xiaoyi Yang1, Siyu Mai1, Thomas K. Berg1, and Zhigai Gao1
Clemson University, Clemson, SC, Medical University of South Carolina, Charleston, Clemson, SC

FRI-266
Imaging Lymphatic Function in a Rat Model of Hypertension and the Impact on Breast Cancer Metastasis
Jialiy Jiajia1, Saygren Stemas1, Abdul Panjshir1, Verakashteia Gogorina1, Sarah White1, Carmen Bergom1, Ma-Tzu Fei1, and Michael Morello1
Medical College of Wisconsin, Milwaukee, WI

FRI-267
4D Light Sheet Fluorescent Imaging to Elucidate Notch and ErbB Signaling in Chemo-Induced Cardiac Injury and Regeneration
Junjie Chen1, Nelson Jan1, Yichen Ding1, Jonathan Gau1, Michael Chen1, Chadi Nabul1, and Brian Packard1,2
Taufique University, Los Angeles, Los Angeles, CA

FRI-268
Using Augmented Reality to Interact with 3D Holographic Images of Intracardiac Geometry and Catheter Positions During Ablation Procedures
Michael Southworth1, Jennifer Silv1, and Jonathan Silver1
Washington University in St Louis School of Engineering and Applied Science, St Louis, MO

FRI-269
A 3D Printed Model of Mitral Valve Prolapose with Accurate Replicability for Surgical Simulation
Takahito Shiraoka1, Masao Yoshitaka1, Yasushi Koyama1, Hiroki Masugi1, Taro Mochizuki1, Akira Kura1, Takaaki Mitaka1, Kishio Toda1, and Yoshiko Saw1
Kansai Rosai Hospital, Osaka, Japan, Osaka University, Suita, Japan, Saharahasho Watanabe Hospital, Osaka, Japan, Osaka University, Okayama, Japan, Chiba University, Chiba, Japan

Track: Biomedical Imaging and Optics, Neuromorphic Engineering

FRI-270
Three-dimensional Neutrophil Distribution in the Acutely Injured Spinal Cord Revealed by Optical Clearing and Lightsheet Imaging
Josue Maldonado1, Linda Nolte-Hawes1, and Todd McDowell1
1, David Gladstone Institutes, San Francisco, CA, 2University of California, San Francisco, CA

FRI-271
Analysis of Preictal Periods by Features and Machine Learning
Fatma Ramadan1,4,5, Amro Karam4, Mohamed Maboud4,2, Diaa Parnicza2, Sandipan Pati2, and Leonidas Iasemidis1
1University of Louisville, Louisville, KY, 2Khalifa University, Abu Dhabi, United Arab Emirates, 3University of Louisville Autism Center, University of Louisville, Louisville, KY, 4Department of Electrical and Computer Engineering, Lehigh University, Bethlehem, PA, 5Pittsburgh Biomedical Engineering Program, Lehigh University, Bethlehem, PA

FRI-272
A Novel Early Diagnosis System for Alzheimer’s Disease Based on Local based Analysis Using 11C PiB PET Scans
Fatma El rashaa Elgamal1, Mohamed Elmagzy1, Ahmed Atwah1, Mohamed Essa1,2, Mohamed Elgamzy1,3,4,5, Gregory Bame1,6, Ashraf Khalil1, and Ayman El Baz1
1Faculty of Computers and Information, Mansoura University, Mansoura, Egypt, 2J. B. Speed School of Engineering, University of Louisville, Louisville, KY, 3Abu Dhabi University, Abu Dhabi, United Arab Emirates, 4School of Medicine, University of South Carolina, Greenville, SC, 5University of Louisville Autism Center, University of Louisville, Louisville, KY

FRI-273
Group-level White Matter Analysis for Middle School Football Athletes in Comparison with High School Athletes: DTI Study
Ikebe Jon1, Troy Shrink1, Nicole Vika1, Shari Levine1, and Thomas Talavage1
1Purdue University, West Lafayette, IN, 2Indiana University, Bloomington, IN

FRI-274
Acutely Injured Spinal Cord Revealed by Optical Holographic Images of Intracardiac Geometry and Clearing and Lightsheet Imaging
Koichi Toda2, and Yoshiki Sawa2
1University of Pennsylvania, Philadelphia, PA

FRI-275
A Non-invasive Functional Circuit Signature of Blast Induced Traumatic Brain Injury Identified by In Vivo Calcium Imaging of Hippocampal CA1 Neurons
Matthew Hempell1, Shanti Tummal1, and David Mearny1
1University of Pennsylvania, Philadelphia, PA

FRI-276
2D and 3D Neuronal Cultures Exhibit Significantly Different Spontaneous Activity Patterns
McFadyen Hassel1 and Veronique Barnouch121,12
1Department of Electrical and Computer Engineering, Lehigh University, Bethlehem, PA, 2Pittsburgh Biomedical Engineering Program, Lehigh University, Bethlehem, PA

FRI-277
Development of Novel Carbon Electrodes for the Detection of Neural Activity using fMREI
Neeraj Aradhna Kumar1, Manish Chand1, and Rossein Sadri1
Arizona State University, Tempe, AZ

FRI-278
Visualizing Beta Band ERD in Stereoscopic 3D: Exploring Brain Activity During Fatiguing Contractions
Priya Balasubramaniam1, Chris Lane1, Dylan Snyder1, and Brian Schmit1
1Marquette University, Milwaukee, WI

FRI-279
Impact of Football Competition on Brain White Matter Microstructure in High School Athletes
Yuka Ida1, Ikebe Jon1, Nicole Vika1, Thomas Talavage1, and Joseph Rispoli3
1Purdue University, West Lafayette, IN

FRI-280
Abnormal White Matter Microstructure and Cognitions in Adolescent Athletes with Concussion History
Yuka Ida1, Ikebe Jon1, Nicole Vika1, Victoria Poslar1, Troy Shrink1, Diane Soddi1, Thomas Redick1, Larry Leverenz1, Eric Nauman1, Thomas Talavage1, and Joseph Rispoli3
1Purdue University, West Lafayette, IN, 2Beth israel Deacconos Medical Center, Boston, MA

FRI-281
Short and Long-term White Matter Microstructural Differences in Adolescent Female Soccer Athletes
Yuka Ida1, Ikebe Jon1, Nicole Vika1, Diane Soddi1, Thomas Redick1, Larry Leverenz1, Eric Nauman1, Thomas Talavage1, and Joseph Rispoli3
1Purdue University, West Lafayette, IN

FRI-282
A Novel MRR-compatible Haptic Interface for Functional Brain Imaging
Atik Subbarao1, Samir Velay1, and Alessandro Belfiore1
1San Jose State University, San Jose, CA, 2Stanford University, Palo Alto, CA
POSTER SESSION—FRIDAY

Friday, October 13 | 9:30 am–5:00 pm | Exhibit Hall 300 North
Poster Viewing with Authors & Refreshment Break | 9:30 am–10:15 am and 2:45 pm–3:30 pm

FRI-283 Acoustoelectric Imaging of Current Stimulation Patterns from a Clinical DBS Device
Chet Preston1, Pier Ingrao1, Yeowan Qin1, William Keef1, Alex Burton1, and Russell White1
1University of Arizona, Tucson, AZ

FRI-284 Functional Connectivity in Stroke Survivors: A Pilot Study
Kelsey Tynes1, Kabib Venkatram1, Miguel Sotelo1, and Brian Schmit1
1Marquette University, Milwaukee, WI

FRI-285 Functional Photoacoustic Tomography for Neonatal Brain Imaging: Developments and Challenges
Mohammadreza Nasiriavanaki1
Wayne State University, Detroit, MI

FRI-286 Brain Networks in Latino Farmworkers With Chronic Exposures to Pesticides
Mohsen Bahrami1, Paul Laurens1, Thomas Arcury1, and Sean Simplicio
1Virginia Tech - Wake Forest School of Biomedical Engineering and Sciences, Winston-Salem, NC, 2Wake Forest School of Medicine, Winston-Salem, NC

FRI-287 A Simple and Realistic Simulation Method for Low-Dose CT
Peng Liu1 and Buzzy Fang1
1Florida International University, Miami, FL, 2FIU, Miami, FL

FRI-288 Statistical Analysis and Performance Limits of Inter-Slice Intensity Estimation in Calcium Imaging
Sumayeh Solitani-Orameh1, Yi Yang Gong1, and Sina Farsiu1
1Duke University, Durham, NC

FRI-289 A New Framework for Incorporating Appearance and Shape Features of Lung Nodules for Precise Diagnosis of Lung Cancer
Ahmed Shafie1, Ahmed Soliman1, Neel Durani1, Brian Wang1, Adel Elmaghrou1, Gernot Gimel1, Victor Varian1, and Emy An1
1University of Louisville, Louisville, KY, 2University of Kentucky, Lexington, KY

FRI-290 Multiplexed Molecular Analysis Using Fluorescence Lifetime Imaging Microscopy (FLIM): Towards Future Cancer Diagnostics
Jared Haun1, Hrishik Patel1, Maha Rahim1, and Enrico Gratton1
1University of California, Irvine, Irvine, CA

FRI-291 Multi-spectral Quantitative Discrimination of Human Ovarian Tissue with Modulated Imaging
Sreyankee Nandy1 and Qing Zhu1
1Washington University in St. Louis, St. Louis, MO

FRI-292 Computational Verification of a Two-layer Inverse Monte Carlo Look-up Table Model Using Diffuse Reflectance Spectroscopy
Yao Zhang1, Amulya Pratapa1, Miller Hay1, and James Tunnel1
1The University of Texas at Austin, Austin, TX, 2The University of Texas MD Anderson Cancer Center, Houston, TX

FRI-293 Evaluation of Cancer-Targeted Contrast Agents for Imaging of Triple Negative Breast Cancer
Nagpa El-Baz1, Ryan Choudhury1, Kurtis James1, Daniel Maks1, Mitigam Zhu1, Jumana Li1, Donald Miller1, Robert Keyston1, Chin Ng1, Ayman El-Baz1, Paul Beteli1, Tanja Maksi1, and Martin D’Toole1
1University of Louisville, Louisville, KY

FRI-294 GLUTS Targeting Fluorescent Probes for Cancer Detection
Shrivas Karna1, Vagashak Bograyan1, Shuai Xia1, Shuai Shai1, Brennan Vogt1, Smitha Ravi1, and Marina Taranova1
1Michigan Tech, Houghton, MI

FRI-295 Extended Field-of-View Ultrasound Does Not Yield Greater Error in Traditional Ultrasound
Amy Adkins1 and Wendy Murray1
1Northwestern University, Evanston, IL

FRI-296 Utility and Feasibility of Apparent Diffusion Coefficient Maps for the Assessment of Intravertebreal Disk Tissue State and Degeneration
Espari Belshy1,2,3,4, Andrey Kalinin1,2,3,4, Morgan Giere1,4, Liudmila Bardonova1,2,3,4, Mark Preul1, and Vadim Byvaltsev1,2,3,4
1Barrow Neurological Institute, Phoenix, AZ, 2School of Medicine, Arizona State University, Tempe, AZ, 3National University of Singapore, Singapore, Singapore, Singapore, 4Institute for Clinical and Experimental Medicine, Prague, Czech Republic

FRI-297 Ultrasound Elastography Probe Design for Rotator Cuff Diagnosis
Glenn Heffer1, Mia Warner1, David Kwiatkowski1, and Delphine Dean1
1Clemson University, Clemson, SC

FRI-298 A New Head-Holder Device for CT Scanning: Adjusting Head Position to Accommodate New CT Scanner Technology
Kawasapo Wong1, Molly Coke2, Charles Bolton1, and Cisna Barba3
1Arizona State University, Tempe, AZ, 2Phoenix Children’s Hospital, Phoenix, AZ

FRI-299 3D Modeling of the Pelvic Floor Structures
Qing Xing1, Lian Khan H. Tran1, Connor Stapp1, Siddhartha Sikdar1, Ping Chen1, Ayed Abubak Shoman1, and Qi We1
1George Mason University, Fairfax, VA, 2Nova Women’s Hospital, Falls Church, VA

FRI-300 A More Accurate and Precise Way to Perform Ultrasound Strain Elastography to Detect Placenta Disease
Shiee Hua Seet1, Jea Y. P. Loo1, Hase Y Lim1, Ciee Narfetch-Zani Mattar1, Arijit Biswas1, Luju Chen1, and Cheen Hwa Yap1
1National University of Singapore, Singapore, Singapore, 2Singapore University of Technology and Design, Singapore, Singapore

FRI-301 Image Fusion of Time-of-Flight MRA and 4D Flow MRI to Enhance Flow Analysis and CFD Modeling of Brain Aneurysms
Ahmadreza Bagh1, Ali Bashahij1, Roshan M. D’Souza1, and Vitaly I. Raizy1
1Purdue University, West Lafayette, IN, 2University of Wisconsin-Milwaukee, Milwaukee, WI

FRI-302 Viscoelasticity of the Porcine and Human Brain through MR Elastography
Ele Gyakari1, Johannes Wiesbrenner1, Ellen Kuhl1, and Mehrmet Kurt1
1Stevens Institute of Technology, Hoboken, NJ, 2Stanford University, Stanford, CA

FRI-303 Mean Deflection Metrics of Chemotactic Neutrophils Confined in 3D Collagen Matrices
Michael Haiman1, Lauren Holbert1, Jonathan Han1, and Christopher Frank1
1University of Virginia, Providence, RI, 2Rho Island Hospital, Providence, RI

FRI-304 Shear Wave Speed in Pressurized Soft Tissue
Kara Hosophoulos1 and Paul Robbins1
1Boston University, Boston, MA, 2Brigham and Women’s Hospital, Boston, MA

FRI-305 The Value of CT Angiography and CFD to Predict Oxygenator Thrombus Location
Robert Conaway1, Jiafeng Zhang1, Yuhang Wang1, Tielius Li1, Jean Azawy1, Zhongjun Wu1, and Barry Swift1
1University of Maryland Baltimore, Baltimore, MD

FRI-306 Use of Polarized Spatial Frequency Domain Imaging for Dynamic Collagenous Tissue Strain Analysis
Samuel Hopper1, Will Gith1, James Tunnel1, and Michael Sacks1
1University of Texas at Austin, Austin, TX

Track: Translational Biomedical Engineering
Imaging Techniques in Clinical Translation

FRI-307 Noncontact Diffuse Correlation Spectroscopy Assessment of Tissue Blood Flow for the Prediction of Mastectomy Skin Flap Necrosis
Mingjun Zhou1, Chong Huang1, Nwamaka Agbokudumo1, Ahmed Bahrami1, Sainav Madhyanarayana1, Wesley Long1, and Gunay Kurt1
1University of Kentucky, Lexington, KY

FRI-308 Triangulation of Feature Points via Stereovision: Toward Deformation Tracking for Image-Guided Breast Surgery
Sarah Goodsell1, MD, Xiaoxiang Yang1, and Michael McCoy2
1Vanderbilt University, Nashville, TN, 2Vanderbilt University Medical Center, Nashville, TN

FRI-309 Quantitative Imaging of Electron Density and Effective Atomic Number Using Spectral CT
Xu Dong1, Olga Per1, Zhicheng Zhang1, and Guohua Cao1
1Wake Forest University, Winston-Salem, NC, 2Chinese Academy of Sciences, Shenzhen, China, People’s Republic of China

FRI-310 Translational Photoacoustic Imaging Technology for the Early Detection of Endometrial Cancer
Christopher Miranda1, José Bandley1, and Barbara Smith1
1Arizona State University, Tempe, AZ, 2Marcinko Integrated Health Systems, Phoenix, AZ

FRI-311 Emotional Arousal and the Perception of Facial Disfigurement
Jiawen Cho1, Michelle Fong1, Sheng-Cheng Huang1, Gregory Rew1, and Mia Markiew1
1The University of Texas at Austin, Austin, TX, 2The University of Texas MD Anderson Cancer Center, Houston, TX
FRI-372 Comparison of Brain Tumor Segmentation Methods For Computing Volumetric and Radial Measurements
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FRI-373 A Computer Aided Diagnosis System for Early Detection of Diabetic Retinopathy using OCTA Scans
Nadanavinda de Silva1, Mohammad Elyou1, Omar Helmy1, Ahmed AbdelFattah1, Alaa Riad1, Harpal Sandhu1, Shomir Schaal1, and Ayman El-Baz1
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FRI-374 The Effect of Cetuximab based Near-Infrared Targeted Photo Therapy on an In-Vivo Pancreatic Cancer Model
Nicolina De Magalhaes1, and Richard Klemke1
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FRI-375 Effect of Multi-Site Datasets On Classifier Performance
Dharmakeerthi Nawarathna1
1Arizona State University, Tempe, AZ

FRI-376 CBCT Platform Setup for Animal Radiation Therapy Experiment
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1University of Toronto, Toronto, ON, Canada, 2Arizona State University, Tempe, AZ

FRI-377 Ligand-ConjugatedParticles in Gastrointestinal Endoscopy for Early Detection of Esophageal Cancer
Mahboudeh Noori1,2, Eran Srebro1, Grady Carlson1, Monica Burdick1, David Drozda1, and Douglas Givertz1
1Ohio University, Athens, OH

FRI-378 Synergistic Effect of Cold Atmospheric Plasma and Drug Loaded Core-shell Nanoparticles on Adult Human Mesenchymal Stem Cell Chondrogenesis
Se-Jun Lee1, Danyon Yan1, Xuan Xhou1, Wei Zhu1, Michael Keidar1, and Lijie Grace Zhang1
1University of California San Diego, San Diego, CA

FRI-379 Green synthesis of Curcuma longa Silver Nanoparticles and its Antimicrobial Evaluation
Bhushan Odelony1, and Alakwale Coker1
1University of Bedford, Bedford, Illinois, IL

FRI-380 Fibrin-targeted Polymerized Silver Microbubbles as Ultrasound Contrast Agents for Detection of Post-surgical Adhomal Adhesions
Catherine A. Gommeli1, Benjamion Kenney1, Stanley J. Heydrick1, R. Glyn Holt1, Jea D. Nagey2, and Joyce M. Wang2
1Boston University, Boston, MA, 2Nanosil/lanPharmaceuticals, Inc, Boston, MA

FRI-381 Mechanism of Nanomaterial Clearance by the Liver
Kim Teal1, Sonya MaxParlend1, Xue-Zhong Ma1, Oyedele Adey1, Anton Ziman1, Ian McGivney1, and Warren Chan1
University of Toronto, Toronto, ON, Canada

FRI-382 Detection of DNA Molecules at Point-of-care Settings without PCR
Logeswaran Velmancan1, Michael Fondesi1, and Dhammakarnpirai Nakhawat1
North Dakota State University, Fargo, ND

FRI-383 Developing a High Throughput in Vitro Platform to Study Liver Stages of the Human Malaria Parasite Plasmodium vivax
Ni Gural1, Ales Miller2, Sandra March1,2, Jitendra Sattabongkot1, and Sujata N. Bharia1,2
1Massachusetts Institute of Technology, Cambridge, MA, 2Broad Institute, Cambridge, MA, 3Moholt Phamaceuticals, Bangalore, Thailand, 4WHME, Cambridge, MA

FRI-384 Evaluating the Potential of Commercially Available Magnetic Nanoparticles for Hyperthermia Applications
Olivia Larrie1, Olema Kordych1, Adam Monsa1, Christopher Nacwe1, Nico Gromov1, Daysha Wakh1, and Jon Dobson1
University of Florida, Gainesville, FL

FRI-385 Laser-Sealing of Soft Tissue Using Plasmonic Silver Nanocomposites
Russell Unrie, Deepanjan Ghosh1, Chengchen Gu1, Mita Thakwad1, Jacqueline Kilborn1, Jeffrey Yerge1, and Kasheal Regal1
1Arizona State University, Tempe, AZ

FRI-386 Microfluidic Filter Device for Dissociation of Aggregates and Tissues into Single Cells
Xiaolong Qiu1, Marissa Pennell1, Jeremy Lombardi1, Griffin Wagner1, Elliot Hu1, and Jared Haun1
1University of California Irvine, Irvine, CA

FRI-387 Microfluidic Device for Rapid Digestion of Tissues into Cellular Suspensions
Xiaolong Qiu1, Trysha M. Westerhof1, Erik Werner2, Amith Kapurparatne1, Pedram P. Payyari3, Jeremy Lombardi1, Edward L. Nelson1, Elliot Hu1, and Jared Haun1
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FRI-388 Measurement of Blood Viscosity Using a Droplet-Based Microfluidic Device
Yunta Li1, Shari Murali1, Kevin Ward1, and Mark A. Burns1,2,3
1Chemical Engineering, University of Michigan, Ann Arbor, MI, 2Emergency Medicine, University of Michigan, Ann Arbor, MI, 3Michigan Center for Integrative Research in Critical Care, University of Michigan, Ann Arbor, MI, 4Biomedical Engineering, University of Michigan, Ann Arbor, MI

FRI-389 Organic LEDs Optically Modulated Neuertainers Expressing Opsins
Arun Siddhanta1, Nurul Akrish1, Shweta Sambharkumar1, James Kay1, Joseph Smith1, and Jit Muthuswamy1
1Arizona State University, Tempe, AZ

FRI-390 High Sensitivity Electrochemical Probe for Multimodal Dopamine and Dopamine Detection in Brain Tissue
Chunli Tan1, Md Imran Hoq1, P. Timothy Doughty1, Jessica Scott1, Shubha Siddiqui1, Teresa Murray1, and Prabhu Anumg1
1Louisiana Tech University, Ruston, LA

FRI-391 Optical Recording of Neural Response in Cultured Neurons during Gold-nanorod Mediated Photothermal Inhibition
Hyunjin Jung1, and Yoonsik Nami1
1KACST, Daejeon, Korea, Republic of Korea

FRI-392 Tuning Topography of Self-Rolled-Up 3D Microtube Arrays to Improve Alignment of Hippocampal Neurons
Olivia V. Campanell1, Elise A. Corbin1, Paul Froote1, Xueling Li1, and Martha Li1
1University of Illinois at Urbana-Champaign, Urbana, IL, 2University of Pennsylvania, Philadelphia, PA

FRI-393 Engineering Defined Neural Cell Patterns Using Surface Acoustic Waves
Sarah Grundstein, Manuel Brugger1, Christof Westerhausen1, Adele Doyle1, and Luke Theisopat1
1Arizona State University, Tempe, AZ

FRI-394 Touch-Spinning of PCL Nanofibers for Nerve Regeneration
Se-Jun Lee1, Darya Asheghi1, Sreey Minko1, and Li Gao Zhang1
1George Washington University, Washington, DC, 2University of Georgia, Athens, GA

FRI-395 Novel Micro/Nano Scale Interfaces for Intracellular Recording
Swethy Sampath Kumar1, and Jit Muthuswamy1
1Arizona State University, Tempe, AZ

FRI-396 Autonomous Microscale System for Intracellular Neural Recording
Swethy Sampath Kumar1, Michael S. Baker1, Murat Okandan1, and Jit Muthuswamy1
1Arizona State University, Tempe, AZ, 2Sandia National Laboratories, Albuquerque, NM

FRI-397 Thermal Challenges in Realizing High-throughput, Robotic Micropositioning Systems for the Brain
Vladislav Vostyarenko1, Michael Baker1, Murat Okandan1, and Jit Muthuswamy1
1Arizona State University, Tempe, AZ, 2Sandia Labs, Albuquerque, NM, 3PMawson Technology, Inc, Albuquerque, NM

FRI-398 A Microfluidic Platform for Dopaminergic Neuron Culture and In Situ Dopamine Uptake Measurements
Yaxuan Sun1, and Matthew Wheeler1
University of Toronto, Toronto, ON, Canada

FRI-399 Synchronized Calcium Oscillation in Astrocyes in 3D Fibrous Scaffold
Bo Chen1, Fanlizhe Shang1, Marlyn McNamara2, Nicole Hassheim1, and Michael Cho1
1University of Texas at Arlington, Arlington, TX, 2Iowa State University, Ames, IA

FRI-400 Programmable Amplifier Array for Various On-chip Electrophysiological Recordings
Kevin White1, Geoffrey Muller1, and Brian Kim1
University of Central Florida, Orlando, FL

FRI-401 Graphene-based Biocompatible Micro Electrode Arrays for Simultaneous Electrical and Optical Measurements of Neuronal Activity
Sai Ravikumar, Guparakrishna Srinivasan2, Ge Yang1, and Tashi Cohen-Kamesar1
1Carnegie Mellon University, Pittsburgh, PA, 2Department of Chemistry, University of Chicago, Chicago, IL

203
**FRI-433**

**Immune Responses to Influenza A Virus DNA Vaccination are Enhanced by Chitosan Nanoparticle Delivery**

- Anna Lempa 1,2, Michael Tyree 1,4, Deborah Brown 1,4, and Angela Panesar 1
- 1University of Nebraska-Lincoln, Lincoln, NE, 2Nature Technology Corporation, Lincoln, NE

**FRI-434**

**Optimization of pH-Responsive, Polymer-Enabled Intracellular Peptide Delivery**

- Brian Erven 1,2, Craig Dowd 1,2, Eric Dasing 1,2, Kameron Kristian 2,3, and Alvin Mualaque 1
- 1Vanderbilt University Medical Center, Nashville, TN, 2Vanderbilt University, Nashville, TN

**FRI-435**

**The Effects of Storage Conditions on Stability of an Antimicrobial Protein within the Immunomatrix Patch**

- Eshani Goradia 1, Adiba Chowdhury 1, Yun Shi Liang 1, Samuel Urena 2, Ryan Von Dolles 1, and Sarswita Katareyna 1
- 1Stony Brook University, Stony Brook, NY, 2Nature Technology Corporation, Cambridge, MA

**FRI-436**

**Novel Approach to Measuring Hydrophobic Drug Nanoparticle Delivery**

- Sema Sevimli 1, Sebastian Joyce 1, and John T. Wilson 1
- 1Northeastern University, Boston, MA

**FRI-441**

**Dual-Functionalized Thermosensitive Ferri-Liposomes for Brain Tumor-Targeted Drug Delivery**

- Del Shi 1, Guojie Ma 1, and Thomas Webster 1
- 1Northeastern University, Boston, MA

**FRI-442**

**Modulation of Endoplasmic Reticulum Stress Associated Brain Endothelial Dysfunction by Natural Osmolytes**

- Jacqueline Sizio 1, Tanja Iseki 1, Zhalin Chen 1, and Mathurin Kanoun 1
- 1University of Michigan-Dearborn, Dearborn, MI, 2University of Michigan-Dearborn, Dearborn, MI

**FRI-443**

**Optimization of Drug Loaded Electrospray Fibers to Induce Fibrosis of the Utero-tubal Junction**

- Henry Kaplan 1, Tamiya Shigeo 1, and Martin O’Toole 1
- 1University of Southern California, Los Angeles, CA, 2Rutgers University, Piscataway, NJ

**FRI-444**

**Alginic Nanoparticles Prepared via W/O Emulsions as Therapeutic Carriers**

- Justin Rosch 1, Allison DuRoss 1, Hayden Winter 2, Anna Brown 1, and Ayse Senlik 1
- 1University of Nebraska-Lincoln, Lincoln, NE, 2University of North Carolina at Chapel Hill, Chapel Hill, NC, 3College of Engineering, University of Missouri, Columbia, MO

**FRI-445**

**Therapeutic Implications of Passive, In Vivo Tumor Necrosis Factor Alpha Production**

- Eshani Goradia 1, Adiba Chowdhury 1, Yun Shi Liang 1, Samuel Urena 2, Ryan Von Dolles 1, and Sarswita Katareyna 1
- 1Stony Brook University, Stony Brook, NY, 2Nature Technology Corporation, Cambridge, MA

**FRI-446**

**Simultaneous Delivery and Imaging of Therapeutic Peptide Molecules via Nanoparticle Formulations**

- Brian Evans 1, Craig Dowd 1,2, Eric Dasing 1,2, Kameron Kristian 2,3, and Alvin Mualaque 1
- 1Vanderbilt University Medical Center, Nashville, TN, 2Vanderbilt University, Nashville, TN

**FRI-447**

**Novel Engineered Silicone Hydrogel Contact Lenses for the Controlled Release of a Diversity of Post-Cataract Therapeutics**

- Mark Byrne 1 and Stephen DiPasquale 1
- 1Rowan University, Glassboro, NJ, 2OcuMedic Inc., Mullica Hill, NJ

**FRI-448**

**Oligonucleotide Hybridized Hydrogels for Sustained Release of Small Molecule (Aptamer) Therapeutics**

- Nikunj Agrawal 1, Rebacca Wachs 1, Yan Du 2, Peter Allen 2, Mark Byrne 1,2, and Stephen DiPasquale 1
- 1University of Florida, Gainesville, FL, 2University of Texas, Austin, TX

**FRI-449**

**Correction of Deletion Mutations in Myosin VIIa via CRISPR-Cas9**

- Eshani Goradia 1, Adiba Chowdhury 1, Yun Shi Liang 1, Samuel Urena 2, Ryan Von Dolles 1, and Sarswita Katareyna 1
- 1Stony Brook University, Stony Brook, NY, 2Nature Technology Corporation, Cambridge, MA

**FRI-450**

**Therapeutic Multisizer Capsules for Ultrasound Imaging and Guided Brain Drug Delivery**

- Sotira Katayama 1, Jun Chen 1, Aaron Allford 1, Veronika Kolesovskaya 1, and Eugenia Khartampeeva 1
- 1University of Alabama at Birmingham, Birmingham, AL

**FRI-451**

**Plasma based Semisynthetic Hydrogels as Alternative to Fibrin Sealants**

- Anastria Frank-Kamenetskii 1, Dmitry Gil 1, John Barry 1, Naren Banik 2, and Christopher Lowe 1
- 1Stony Brook University, Stony Brook, NY, 2Nature Technology Corporation, Cambridge, MA

**FRI-452**

**Effects of Formulation Parameters on the Size of Biodegradable Fluorescent Nanoparticles**

- Anwetta Kurakul 1, Paula Perez 1, Nikhil Pandey 1, Qingyang Shang 2, and Kiyos Nogayama 1
- 1Ut Arlington, Arlington, TX, 2University of Texas at El Paso, El Paso, TX, 3Pennsylvania State University, State College, PA

**FRI-453**

**Targeting and Imaging of Therapeutic Factors via Native Free Radicals**

- Christopher Lowe 1, Keana Mirmajlesi 1, and David Shreiber 1
- 1Rutgers University, Piscataway, NJ

**FRI-454**

**Injectable in Situ Forming Depot Systems for Long-Acting Contraception**

- Delphi X. Lian 1, Shriram Subramaniam 1, Kazunori Kanazawa 1, Liangchun Wu 1, Timothy O. Mandrell 1, and James R. Johnson 1
- 1Ohio State University, Columbus, OH

**FRI-455**

**Enzyme-Cleavable Peptide Amphiphiles Enhance Intracellular Delivery**

- Handan Acar 1, Mathew R. Schnorenberg 1, James L. Labell 1, and Matthew V. Tironi 1
- 1The University of Chicago, Chicago, IL

**FRI-456**

**Effect of Chitosan’s Biophysical Properties on Intravesical Drug Delivery**

- Jared J. Hopkins 1, Sean G. Smith 1, and David A. Zaharoff 1
- 1University of North Carolina, Chapel Hill, NC, 2University of Texas at El Paso, El Paso, TX, 3Pennsylvania State University, State College, PA

**FRI-457**

**Oral Delivery of Therapeutic Peptide Amphiphiles for Polycystic Kidney Disease**

- Jonathan Irvin 1, Tania Betancourt 1, and David J. Jr. Reiner 1
- 1University of Florida, Gainesville, FL, 2Texas A&M University, College Station, TX

**FRI-458**

**Biocompatible Electrosprun Nanofibrous Scaffolds Enhance Tumoricidal Stem Cell Therapy in Surgical Model of Glioblastoma Resection and Recurrence**

- Kathryn Moose 1, Juli Bagey 2, Oyin Ocloja 1, Maha Mohsin Ali 1, Elisabeth Loboa 1, and Shawn Higginbotham 1
- 1The University of North Carolina at Chapel Hill and North Carolina State University, Raleigh, NC, 2UNC Eshelman School of Pharmacy, University of North Carolina, Chapel Hill, NC, 3College of Engineering, University of Missouri, Columbia, MO

**FRI-459**

**Preparation and Optimization of Chemically Modified Oligonucleotides as Vehicles for Targeted Drug Delivery**

- Keen Enoki 1, Surya Banki 1, Victor Ague 2, Aubrey Peedier 1, Mark Weilburger 1, and Emmanuel Opera 2
- 1Wake Forest University, Winston-Salem, NC, 2Yonafish Tech, Winston-Salem, NC

**FRI-460**

**Mechanisms of Cell Death Caused by Photothermal Ablation of Cancer Cells Mediated by Conductive Polymer Nanoparticles**

- Madeline Huff 1, Eda Baykal-Caglar 1, Janet Veia Ross 1, James Turnell 2, Jennifer Irv 1, and Tania Betancourt 1
- 1Texas State University, San Marcos, TX, 2University of Austin, Austin, TX

**FRI-461**

**PNDJ Hydrogel Provides High, Sustained Antimicrobial Levels in Orthopaedic Surgical Sites**

- Michael Nguyen 1, Vaja Badh 1, Erin Childers 1, Alex McLaren 1, and Derek Overstreet 1
- 1University of North Carolina, Chapel Hill, NC, 2Sonoran Biosciences, Chandler, AZ, 3University of Arizona, College of Medicine, Phoenix, AZ

**FRI-462**

**Heparin-Coated Magnetic Nanoparticles Uptake by Fibroblasts and Vascular Cells**

- Nandine Gobriel 1, Benjamin Fellows 1, Olinv Medford 1, and Clever Price 1
- 1Clemson University, Clemson, SC

**FRI-463**

**Maximizing Drug Loading in Microbubbles for Ultrasound -Mediated Drug Delivery**

- PNDJ Hydrogel Provides High, Sustained Antimicrobial Levels in Orthopaedic Surgical Sites

- Michael Nguyen 1, Vaja Badh 1, Erin Childers 1, Alex McLaren 1, and Derek Overstreet 1
- 1University of North Carolina, Chapel Hill, NC, 2Sonoran Biosciences, Chandler, AZ, 3University of Arizona, College of Medicine, Phoenix, AZ

**FRI-464**

**Antibacterial Properties of Nitric Oxide from a Gold® and Keyes Ampibler**

- Aneetta Kuriakose 1, Paula Perez 2, Nikhil Pandey 1, Dingying Shan 3, and Madeline Huff 1
- 1Arizona State University, Tempe, AZ, 2University of Texas at El Paso, El Paso, TX, 3Pennsylvania State University, State College, PA

**FRI-465**

**Overcoming Inherent Chemotherapeutic Resistance of Liver Cancer through Concurrent Intratumoral Delivery of Drug and Chemosensitizer**

- Selva Jegsambal 1, Christopher Hernandez 1, Arshad Ohringa 1, and Agata Esmier 1
- 1Case Western Reserve University, Cleveland, OH
FRI-466 Degradable Algaline Hydrogels for Controlled Release
Shohi Sharma1, Justin Madrigal1, and Eduard Silva1
University of California, Davis, Davis, CA

FRI-467 Engineered Polymeric Matrices with Controlled Protein Release for Rotator Cuff Tendon Repair
Vandana Verma, Anupama Prabhakar, Srijanvijay Kumbhar, and Cato Laurencin1
UC San Health, Farmington, CT

FRI-468 Extended Antibiotics Release by Incorporation of Calcium Polyphosphate Gel in PMMA Cement
Weiping Ren1, Wei Song1, and David Markal1
Wayne State University, Detroit, MI, Providence Hospital, Southfield, MI

FRI-469 Efficient Intracellular Gene Therapeutics Delivery Using Biodegradable Lipid-Like Nanoparticles
Yasmeen Li1, Yang Tao1, Zheng Yi Chen1, and Qingsheng Xu1
Tufu University, Madison, MA, Harvard Medical School, Boston, MA

Track: Drug Delivery & Intelligent Systems, Cancer Technologies
Drug Delivery for Immunomodulation and Immunotherapy

FRI-470 Platelets with Checkpoint Inhibitors for Post-surgical Cancer Immunotherapy
Patrick Han1, Sean Bickham1, Shihan Khan1, Jingsheng Lin1, Eric Song1, and Tarek Fahmy1
Yale University, New Haven, CT

FRI-471 Does Co-encapsulation Matter? Probing the Biophysical and Functional Impacts of Nanoparticle Combinatorial Delivery
Patrick Han1, Sean Bickham1, Shihan Khan1, Jingsheng Lin1, Eric Song1, and Tarek Fahmy1
Yale University, New Haven, CT

FRI-472 Development of a Drug Loaded Nano-Liposomal Vesicle Platform to Use in Drug Carrier Cell Applications for the Treatment of ImmunoChemotherapy Outcomes
Serkan Yaman1, Jon A. Wiedanz1, and Jon Dobson1
University of Nebraska–Lincoln, Lincoln, NE

FRI-473 Self-Assembly of Degradable Immune Polyplexes to Control Toll-like Receptor Function
Shannon J. Ha1 and Christopher M. Jewell1,2,3,4
1Wayne State University, Detroit, MI, 2Providence Hospital, Southfield, MI

FRI-474 Electromagnetic Nanoparticles as a Clinically Accessible Biomarker of Patient Response to Dendritic Cell Vaccines
Adam Aigrain1, Elias Suyama1, Brandon Wummer1, Adam Monar1, Jon Dobson1, and Duane Mitchell1
1University of Florida, Gainesville, FL

FRI-475 Computationally-Designed Nano-therapeutics for Immune Modulation of the Tumor Microenvironment
Ashish Kulkarni1
1Harvard Medical School, Cambridge, MA

FRI-476 Enhancing Immune Cells using Plasma Membrane-inserting Drugs to Combat Cancer
Emily M. Szydlowski1, Michael H. Zhang1, Nargis A. Stephane1, and Gary D. Sato1
1University of California, Davis, CA

FRI-477 Development of a Drug Loaded Nano-Liposomal Vesicle Platform to Use in Drug Carrier Cell Applications for the Treatment of ImmunoChemotherapy Outcomes
Serkan Yaman1, Jon A. Wiedanz1, and Jon Dobson1
University of Nebraska–Lincoln, Lincoln, NE

FRI-478 Spatiotemporal Release of Bioactive Molecules for Tissue Engineering Applications
Amir Najafpaz1 and David Polak1
1University of Kentucky, Lexington, KY

FRI-479 Development of a Tissue Regeneration Matrix with Anti-Breast Cancer Properties
Heather Gregory1, Bailey-Jean Walker1, Kendyl Williams1, and Brian Booth1
1Clemson University, Clemson, SC

FRI-480 Localization of Inactivated Oncogene Sequenced Beads Scaffolds
Jiapu Liang1, Kaiyuan Jiang1, and Cherie Stabler1
1University of Florida, Gainesville, FL

FRI-481 Activation of an Osteochondral Bioreactor for In Vitro Drug Screening
Kelon Owolabi1, Alessandra Piron1, Rocky Tsui1, and Riccardo Gottard1
1University of Pittsburgh, Pittsburgh, PA

FRI-482 Electroosmotic Growth Factor Delivery from Polypropylene Coated Polyvinylidene Fluoride Electrospray Fibers
Salish Makar1 and Tae-Goul1
1University of Texas at San Antonio, San Antonio, TX

FRI-483 Cold Atmospheric Plasma (CAP) Modified Core-shell Nanofibers for Bone Tissue Engineering Applications
Yangfeng Zhou1, Mian Wang1, Michael Kardas1, and Thomas Webster1
1Northwestern University, Evanston, IL, 2The George Washington University, Washington, DC

FRI-484 Alginate-Liposomal Bupivacaine Formulation Preserves Mesenchymal Stromal Cells Anti-Inflammatory Function
Koami A. Perez1, Mollie Davis1, Sawa Marini-Bernicci1, Timothy Maguire1, Rene S. Schlief1, Joel Yarmush1, and Martin L. Yarmush1
1Rutgers University, Piscataway, NJ, 2Beaufold Pharmaceuticals, LLC, New York, NY, 3New York Presbyterian-Brooklyn Methodist Hospital, Brooklyn, NY

Track: Drug Delivery & Intelligent Systems, Nanomedicine and Nanotechnology

FRI-485 Self-Assembly of Smart Multifunctional Hybrid Compartments with Programmable Bioactivity
Gong Cheng1, Siue Hai1, Yuan Wei1, and Siue Yang1
1Penn State University, University Park, PA

FRI-486 Trafficking and Processing of Self-assembled Immune Signals in Primary Antigen Presenting Cells
Michelle L. Bookstaver1, Kristy L. Haw1, and Christopher M. Jewell2,3
1Truch Oil Department of Bioengineering, University of Maryland-College Park, College Park, MD, 2Department of Microbiology and Immunology, University of Maryland Medical School, Baltimore, MD, 3Marine and Stewart Greenebaum Cancer Center, Baltimore, MD

FRI-487 Membrane-Imprinted Polyelectrolyte Complexes as Potential Drug Delivery Systems
Namho Kim1,2, Alessandra Livraghi-Butrico3, Richard C. Boucher3, Martina L. McCaffrey3, Justin Hanes1,2, and Jung Soo Suk2
1University of North Carolina at Chapel Hill, Chapel Hill, NC

FRI-488 Novel Gene Delivery via Cell-nanoparticle Hybridization
Remy C. Cooper1, Leyeun Xu1,2, and Hu Yang1
1Virginia Commonwealth University, Richmond, VA, 2Yale University, New Haven, CT

FRI-489 Layer-by-layer Assembly of siRNA on Si-ATRP Shelled Gold Nanoparticles
Soo Lee1, Hyungsun Kim1, Youngjoo Son1, Wei Mao1, Myoung Jo Kang1, Soon Shin1, and Hyuksoo Yoo1
1Kwangwoon National University, Cheonshin-e, Korea, Republic of Korea

FRI-490 Lipid nanoparticle-based mRNA delivery to the Brain
Venkatesh Deshpande1, Kevin Kaufman1, James Kaczmarek1, Dan Anderson1, and Jay Sy1
1Rutgers University, Piscataway, NJ, 2Massachusetts Institute of Technology, Cambridge, MA

Track: Drug Delivery & Intelligent Systems, Tissue Engineering

FRI-491 Development of Carbon Monoxide-Releasing Poly(diol citrate) Polymer as a Potential Surface Modifier for Vascular Graft Applications
Danni Lichlyter1, Jenny Poon1, and Antonio Webb1
1University of Florida, Gainesville, FL

FRI-492 Effect of Formulation Variables on Injetability, In Vitro Release and In Vivo Initial Burst of Injectable In Situ Forming Depot Systems
D쉽 R. Baneag1, Surayutha Anirulha1, Lisha Wang1, Timothy D. Marshfield1, James R. Johnson2, and Tao L. Lowe1
1University of Tennessee Health Science Center, Memphis, TN
BMES 2017 | Phoenix
Friday, October 13 | 9:30 am–5:00 pm | Exhibit Hall 300 North
Poster Viewing with Authors & Refreshment Break | 9:30 am–10:15 am and 2:45 pm–3:30 pm

FRI-497 Contractive Hormone-loaded Electrop spun Patches in Combination with Microneedles for Transdermal Drug Delivery
Muhammad Mustafa1 and Mark R. Prausnitz2 | School of Chemical and Biomolecular Engineering, Georgia Institute of Technology, Atlanta, GA

FRI-498 Measurement of Sustainable Release of Mitofusine from Biodegradable Nanoparticles Using a New Colorimetric Detection Assay
Rebecca Byler1, Diane McMahon-Pratt1, and Taryn Fahmy1 | Yale School of Engineering and Applied Science, New Haven, CT

FRI-499 Rapidly Separable Microneedle Patches for Sustained Release of Contractive Hormones
We Li, Richard Terry1, and Mark Prausnitz | Georgia Institute of Technology, Atlanta, GA

Track: Drug Delivery & Intelligent Systems
Targeted or Responsive Delivery Systems

FRI-500 Epitope-functionalized Nanoparticles for Entrapment of Autism Auto-antibodies
Amit Bhalerao1, Elizabeth Edmiston1, Kenneth Alvarez2, Judy Van De Water2, and Jamie Lewis1 | UC Davis, Davis, CA, M.I.N.D. (Medical Investigation of Neurodevelopmental Disorders) Institute, Davis, CA

FRI-501 Gelatin Nanoparticle Loading of Anti-Psoriatic Compound for Treatment of Leishmaniasis Carlos Serna1, Alfredo Orozco1, Eva Iñiguez1, Katja Michael1, Rossa Maldonado1, and Thomas Bolandparvaz1 | The University of Texas at El Paso, El Paso, TX

FRI-502 Red Blood Cells for Glucose-Responsive Insulin Delivery
Chao Wang1 and Zhen Gu1 | University of North Carolina at Chapel Hill, North Carolina State University, Raleigh, NC

FRI-503 IR820-Loaded PLGA Nanoparticles for Photothermal Therapy of Triple Negative Breast Cancer
Davide Telicci1, Shoná O’Sullivan2, and Emily Day1 | University of Texas at Arlington, Arlington, TX, 2Joint Biomedical Engineering Program between the University of Texas at Arlington and the University of Texas Southwestern Medical Center, Dallas, TX

FRI-505 Enzymatic-Responsive Nanoparticles as Drug Carriers to Treat Cancer
Duong Le1, Hien Lam2, Tran Vi3, and Kyat Nguyen1,2 | 1University of Texas at Arlington, Arlington, TX, 2Joint Biomedical Engineering Program between the University of Texas at Arlington and the University of Texas Southwestern Medical Center, Dallas, TX

FRI-506 Investigation of Protein Modulus for Vascular Targeted Delivery Drug In Vitro and In Vivo
Gannas Lopez-Garcia1, Marigny Tellez1, Katherine Froemke1, Timothy Scott1, Raymond Aski1, and Michael Holinsat1 | UCLA, Los Angeles, CA

FRI-507 NIR-Induced Spatiotemporally Controlled Gene Silencing in Cells
Guan Chen1, Ben Mao2, and Shaoping Gong1 | University of Wisconsin-Madison, Madison, WI, Fourth Military Medical University, Xi’an, China, People’s Republic of China

FRI-508 Blood-Brain Barrier Disruption by Novel Cationic Polymers
Jameela Simmons1, Shu Liu1, Kevin Edgar1, and Yong Woo Lee1 | Virginia Tech, Blacksburg, VA

FRI-509 Pretargeting for Prolonged Retention of Mucus- Penetrating Particles at Mucosal Surfaces
Justin Hochberg1, Christina Kubler1, Cecilia Wadsworth1, Jay Newby1, and Sam Lee1 | University of North Carolina-Chapel Hill, Chapel Hill, NC

FRI-510 Redox Dual-Responsive Biodegradable Polymeric Micelles with High Drug Loading for Effective Anticancer Drug Delivery
Jye Yng Teo1,2, Willy Chin2, Xiyu Ke2, Shujun Gao2, Shaoqiong Liu2, and Caterina Capelli1,2 | The University of Texas at Arlington, Arlington, TX, 2Joint Biomedical Engineering Program between the University of Texas at Arlington and the University of Texas Southwestern Medical Center, Dallas, TX

FRI-511 MMP-Responsive Hydrogels for siRNA Delivery after Myocardial Infarction
Leo Wang1, Jennifer Chung1, Parom Nilent2, and Jason Burdick1 | University of Pennsylvania, Philadelphia, PA

FRI-512 Acoustic-transfusing use of High Frequency Ultrasound for Cell Manipulation
Sangdong Yao1, Pengwei Wang1, Yingxiao Wang2, and K. Krick Shung1 | University of Southern California, Los Angeles, CA, 2University of California, San Diego, La Jolla, CA

FRI-513 Establishing an Animal Model Artificial Pancreas System to Study Blood Glucose Levels in Real-Time
Sarah Park1, Ramon Baluchaehdi1, Hoo Sang Ko1, H Felix Lee1, and Quim Kase1 | Southern Illinois University Edwardsville, Edwardsville, IL

FRI-514 Selecting an Optimally Charged Cartilage-Targeting Delivery Carrier for Post-Traumatic Osteoarthritis
Yoonjye Park1, Zhe Zhang1, Madison Taylor1, and Xingyu He1 | University of Cincinnati, Cincinnati, OH

FRI-515 You Can Trigger and Monitor Drug Release for a Long Time
Yoonjye Park1, Zhe Zhang1, Madison Taylor1, and Xingyu He1 | University of Cincinnati, Cincinnati, OH

Track: Drug Delivery & Intelligent Systems
Drug Delivery & Intelligent Systems—Other/Non-Specified

FRI-516 Surface Properties of Silica Nanoparticles Regulate Their Interactions with Cell Membrane Models
Ali Asghari Agha1, Saeed Nazeemabadi2, Alexander Kelly3, Addy Kruis1, Katherine Cimatu2, Allan Davov1, and Arm Farnoud1 | The Ohio State University, Athens, OH, 2Auburn University, Auburn, AL

FRI-517 Design of a Universal Microscope Incubator for Drug Screening of 3D Models of Engineered Myocardium
Marianne Kanfala1, Rachel Connolly1, Heather Stratza1, Katrina Hansert1, Megan Chrobak1, Glenn Gaudette1, John Sullivan1, and George Pira1 | Worcester Polytechnic Institute, Worcester, MA

Track: Biomechanics
Human Performance/Sports Biomechanics

FRI-518 The Effect of Vision Compared to Additional Support on Stability after a Perturbation
Anita Moore1, Pouye Sedighian1, Shadna Akhtar1, and Katrina Hansen1 | California State University Long Beach, Long Beach, CA

FRI-519 Novel Compression Method to Measure Structural Stiffness Differences in Football Faceguards
Alex Bina1, Steve Sikic1, Gregory Bati1, and John Desmond1 | Clemson University, Clemson, SC

FRI-520 Timing of Major Pitching Motion Events in Youth Baseball Players In Relation to Elbow and Shoulder Moment
Andrew Chang1, Jianshun Zhao1, Kristo Kopp1, and Michelle Sabick1 | Saint Louis University, St. Louis, MO, 2Marquette University, Milwaukee, WI

FRI-521 Effects of Visual Feedback Distortion on Gait Asymmetry Induced by Unilateral Load Perturbation
Carlos Tobar1, Eva Martinez1, and Seung Jea Kim1 | California Baptist University, Riverside, CA

FRI-522 The Effects of Backpack Type on Kinetcs of Lower Back and Abdominal Muscles during Walking and Jogging
Caamun Sari1, Iman Shojaei1, and Babak Baaragani1 | University of Kentucky, Lexington, KY

FRI-523 Parametric Analysis of Fatigue in Stationary Biking: A Computational Approach
Deepak Santanaprapar1, Austin Hurley1, and Matthew Parner1 | University of Virginia, Charlottesville, VA

FRI-524 Optimal Design and Control of a Rowing Exercise Machine
Farhod Rohbati1, Hanz Richter1, and Antonio J. van den Bogert1 | Cleveland State University, Cleveland, OH

FRI-525 Entropy Analysis of Ankles Stability in Relation to Environmental Mechanics
Harrison Hanlick1 and Hyunglae Lee1 | Arizona State University, Tempe, AZ

FRI-526 Ramp Perturbation Tests are too Simple to Identify a Realistic Controller in Human Standing Balance
Hussein Wang1 and Antonie van den Bogert1 | Cleveland State University, Cleveland, OH

FRI-527 Reflexive Behaviors of Trunk Muscles in Sudden Perturbations: The Effects of Age
Iman Shojaei1, and Babak Baaragani1 | University of Kentucky, Lexington, KY

FRI-528 Head Impacts in Soccer: Measurement and Characterization of Influencing Parameters
Josh Auger1, Justin Markel1, Dimitri Paskoski1, Nicolas Leiva1, Thomas Talavage1, Leonardo1, and Eric Nauman1 | Purdue University, West Lafayette, IN, 2University of Los Andes, Bogota, Colombia

FRI-529 Changes In Head Impact Exposure Over Consecutive Seasons Among Individual Youth Football Players
Miriele Kelley1, Jillian Urban1,2, Meagan Rosenberg1,2, Christopher Whitmer1, Joseph Matijan1, and Joel Stitzel1 | 1Virginia Tech-Wake Forest University School of Biomedical Engineering and Sciences, Winston-Salem, NC, 2Florida State College at Jacksonville, Winston-Salem, NC, 3University of Texas Southwestern Medical Center, Dallas, TX

BMES 2017 | Phoenix
Friday, October 13 | 9:30 am–5:00 pm | Exhibit Hall 300 North
Poster Viewing with Authors & Refreshment Break | 9:30 am–10:15 am and 2:45 pm–3:30 pm

FRI-543 Characterization of Influencing Parameters Head Impacts in Soccer: Measurement and Characterization of Influencing Parameters
Andrew Chang1, Jianshun Zhao1, Kristo Kopp1, and Michelle Sabick1 | Saint Louis University, St. Louis, MO, 2Marquette University, Milwaukee, WI

POSTER SESSION—FRIDAY

POSTER SESSION—THURSDAY

POSTER SESSION—WEDNESDAY

POSTER SESSION—TUESDAY

POSTER SESSION—MONDAY

POSTER SESSION—SUNDAY
FRI-539 Finite Element Based Pelvic Injury Metric Creation and Validation in Lateral Impact for a Human Body Model
Catlin Weaver1, 2, Alexander Baker1, Matthew Davis1, Anna Miller1, and Joel Sittig1
Virginia Tech - Wase Forest University Center for Injury Biomechanics, Winston-Salem, NC; 1Wase Forest School of Medicine, Winston-Salem, NC; 2US Army Research Laboratory Soldier Protection Sciences Branch, Aberdeen Proving Ground, MD, "Virginia Tech - Wake Forest University Center for Injury Biomechanics, Winston-Salem, NC; 1Wase Forest School of Medicine, Winston-Salem, NC; 2US Army Research Laboratory Soldier Protection Sciences Branch, Aberdeen Proving Ground, MD, "Virginia Tech - Wake Forest University Center for Injury Biomechanics, Winston-Salem, NC; 1Wase Forest School of Medicine, Winston-Salem, NC; 2US Army Research Laboratory Soldier Protection Sciences Branch, Aberdeen Proving Ground, MD, "Virginia Tech - Wake Forest University Center for Injury Biomechanics, Winston-Salem, NC; 1Wase Forest School of Medicine, Winston-Salem, NC; 2US Army Research Laboratory Soldier Protection Sciences Branch, Aberdeen Proving Ground, MD, "Virginia Tech - Wake Forest University Center for Injury Biomechanics, Winston-Salem, NC; 1Wase Forest School of Medicine, Winston-Salem, NC; 2US Army Research Laboratory Soldier Protection Sciences Branch, Aberdeen Proving Ground, MD, "Virginia Tech - Wake Forest University Center for Injury Biomechanics, Winston-Salem, NC; 1Wase Forest School of Medicine, Winston-Salem, NC; 2US Army Research Laboratory Soldier Protection Sciences Branch, Aberdeen Proving Ground, MD, "Virginia Tech - Wake Forest University Center for Injury Biomechanics, Winston-Salem, NC; 1Wase Forest School of Medicine, Winston-Salem, NC; 2US Army Research Laboratory Soldier Protection Sciences Branch, Aberdeen Proving Ground, MD.

FRI-540 Development of Human Rib Cortical Bone Material Model using Finite Element Analysis
Keehan Yates1, and Costin Luminari1
Virginia Tech, Blacksburg, VA

FRI-541 Skull Deflection Effects on Brain Tissue Response Using Finite Element Simulation
Derek Jones1, 2, John Bolte1, 2, and Joel Sittig1, 2
Virginia Tech - Wase Forest University Center for Injury Biomechanics, Winston-Salem, NC; 1Wase Forest School of Medicine, Winston-Salem, NC; 2US Army Research Laboratory Soldier Protection Sciences Branch, Aberdeen Proving Ground, MD, "Virginia Tech - Wase Forest University Center for Injury Biomechanics, Winston-Salem, NC; 1Wase Forest School of Medicine, Winston-Salem, NC; 2US Army Research Laboratory Soldier Protection Sciences Branch, Aberdeen Proving Ground, MD, "Virginia Tech - Wase Forest University Center for Injury Biomechanics, Winston-Salem, NC; 1Wase Forest School of Medicine, Winston-Salem, NC; 2US Army Research Laboratory Soldier Protection Sciences Branch, Aberdeen Proving Ground, MD, "Virginia Tech - Wase Forest University Center for Injury Biomechanics, Winston-Salem, NC; 1Wase Forest School of Medicine, Winston-Salem, NC; 2US Army Research Laboratory Soldier Protection Sciences Branch, Aberdeen Proving Ground, MD, "Virginia Tech - Wase Forest University Center for Injury Biomechanics, Winston-Salem, NC; 1Wase Forest School of Medicine, Winston-Salem, NC; 2US Army Research Laboratory Soldier Protection Sciences Branch, Aberdeen Proving Ground, MD, "Virginia Tech - Wase Forest University Center for Injury Biomechanics, Winston-Salem, NC; 1Wase Forest School of Medicine, Winston-Salem, NC; 2US Army Research Laboratory Soldier Protection Sciences Branch, Aberdeen Proving Ground, MD, "Virginia Tech - Wase Forest University Center for Injury Biomechanics, Winston-Salem, NC; 1Wase Forest School of Medicine, Winston-Salem, NC; 2US Army Research Laboratory Soldier Protection Sciences Branch, Aberdeen Proving Ground, MD.

FRI-542 Quantifying the Range of Injury Risk to the Head And Neck from Unmanned Aircraft Systems
EEmma Mogilner1, 2, Katsuragawa3, Ryan Gellner1, Bethany Rowson1, Eamon Campolettano1, and Steven Rowson1
Virginia Tech, Blacksburg, VA

FRI-543 Injury Simulation of While Wearing High Heel Footwear
Haricharan Singh Ranu1
American Orthopaedic Biomechanics Research Institute, Atlanta, GA

FRI-544 Effects of Anthropometric and Environmental Variables on Biomechanical Measures of Head Impact Exposure in Youth Football Players
Brian Urban1, 2, Michaela Kelley1, Mark Exlczki1, Logan Miller1, Derek Jones1, Elizabeth Deavenport1, Christopher Whitlow1, 2, and Joel Sittig1, 2
Virginia Tech - Wake Forest School of Biomedical Engineering and Sciences, Winston-Salem, NC; 1Wase Forest School of Medicine, Clinical and Translational Sciences Institute, Winston-Salem, NC; 1Wase Forest School of Medicine, Department of Biostatistical Sciences, Winston-Salem, NC; 1University of Texas Southwestern, Department of Radiology, Dallas, TX; 1Wake Forest School of Medicine, Department of Biostatistical Sciences, Winston-Salem, NC; 1Wase Forest School of Medicine, Clinical and Translational Sciences Institute, Winston-Salem, NC; 1Wase Forest School of Medicine, Department of Biostatistical Sciences, Winston-Salem, NC; 1University of Texas Southwestern, Department of Radiology, Dallas, TX; 1Wake Forest School of Medicine, Department of Biostatistical Sciences, Winston-Salem, NC; 1Wase Forest School of Medicine, Department of Biostatistical Sciences, Winston-Salem, NC.

FRI-545 Effects of Cervical Spine Ligament Sprain on Head and Neck Stability
Jitendra Sreelekha1, Roush Khameel1, Calvin Kuo1, and David Camarillo1
Stanford University, Stanford, CA

FRI-546 Disease Related and Regional Differences in Properties of the Equine Temporomandibular Joint Disc
Jose A-ipal1, 2, Rose Ann3, and Derek Crisl1
1School of Veterinary Medicine, University of California, Davis, Davis, CA; 2University of California, Davis, Davis, CA; 3University of California, Davis, Davis, CA.

FRI-547 Development of a Gottingen Miniature Pig Finite Element Model to Investigate Injury Scaling Techniques
Keehan Yates1 and Costin Luminari1
Virginia Tech, Blacksburg, VA

FRI-548 Comparative Analysis of Impact Attenuation Properties from Soccer Headgear
Kevin McVie1, Goutham Sankaran1, Justin Markel1, Tom Talavage1, Larry Leverenz1, and Eric Nauman1
1Virginia Tech, Blacksburg, VA; 1Virginia Tech - Wase Forest University Center for Injury Biomechanics, Winston-Salem, NC; 1Wase Forest School of Medicine, Winston-Salem, NC; 1Clinical and Translational Science Institute, Winston-Salem, NC.

FRI-549 Effect of Achilles Taping on Joint Contributions to Work and Power
Kirsten Bonnin1, Evan McConnell1, Alex Black1, Lewis Young1, and Robin Queen1
1Civil and Environmental Engineering, University of Washington, Seattle, WA; 1Virginia Tech, Blacksburg, VA; 1Virginia Tech - Wase Forest University Center for Injury Biomechanics, Winston-Salem, NC; 1Wase Forest School of Medicine, Winston-Salem, NC.

FRI-550 Biomechanics of Orbital Floor Fractures
Lyzing Zhang1, Sagar Patel1, Christopher Andreevich1, Michael Silverman1, and Mahdi Shokouh1
1Wayne State University, Detroit, MI

FRI-551 Hearing Damage Caused by Multiple Blast Exposure-A Study on Middle Ear and Cochlea Function Changes in Chinchillas
Ron Gai1, Tao Chen1, Kyle Smish1, and Zachary Yokell1
1Virginia Tech, Blacksburg, VA; 1Virginia Tech - Wase Forest University Center for Injury Biomechanics, Winston-Salem, NC; 1Wase Forest School of Medicine, Winston-Salem, NC.

FRI-552 Are Humans More Accurate than Sensors in Head Impact Severity Estimation?
Kosa Hamakami1, Jude Shefer1, Calvin Kuo1, Lyndia Wu1, and David Camarillo1
1Stanford University, Stanford, CA

FRI-553 Effect of Tackling Form on Head Acceleration in Youth Football
Ryan Gellner1, Eamon Campolettano1, and Steven Rowson1
Virginia Tech, Blacksburg, VA

FRI-554 Design of Wearable Protection System for a Fall Injury Reduction
Taekyeong Lee1, Hunhee Kim1, Youngho Lee1, Jaemin Kim1, Soonmoo Jung1, Dongwook Yang1, Jeongwoon Lee1, Beomgun Jo1, Chansoo Lee1, and Junghyea Hong1
1Korea University, Sejong, Korea, Republic of Korea

FRI-555 Biomechanical Investigation of Ankle Injuries Sustained from Foot Pronation and Supination in Subtalar Joint (ST)-Closed Kinematics Chain Injuries
Yeong Lee1, Binh Nguyen2, and Ha Vo1
1Mercury University, Macon, GA; 2Texas A&M University, College Station, TX

FRI-556 Methods of Serious-to-Fatal Injury in Rear-Struck Vehicle Occupants in the U.S.
Whitney Tatem1 and H. Clay Gabler1
1Virginia Tech, Blacksburg, VA

FRI-557 A Modular Simulated Human Body Finite Element Model Can Reduce Run-Time Requirements for Lower Extremity Impact Biomechanics Studies
Nathan Driessler1, Brian Knap1, and Cameron Goulbourne1
1Virginia Tech - Wase Forest University Center for Injury Biomechanics, Winston-Salem, NC; 1Wase Forest School of Medicine, Winston-Salem, NC;

FRI-558 Comparing Injury Prediction Performance Between Supervised Machine Learning and Regression
Yunkang Cai1, Wei Zhao1, and Songbai Ji1
1Worcester Polytechnic Institute, Worcester, MA, 2Dartmouth College, Hanover, NH

Track: Orthopedic and Rehabilitation Engineering
Articular Cartilage, Meniscus and Joints
FRI-559 A Whole-Joint-in-Motion Culture System Reveals a Critical Role of Glucose in Regulating Articular Cartilage and Growth Plate Matrix Production
Carola M. Maglione1, Christopher Nehme1, Kirsten Carr1, Rose Banks1, Thomas James1, William Messner2, and Li Zeng1
1Tufts University, Boston, MA; 2Tufts University, Medford, MA

FRI-560 Gold Nanoparticle-Homogenized Tissue-Hyaluronic Acid Conjugates for Limiting Progression of Osteoarthritis
Colleen Smider1, David Missouri, and Sheila Grant1
1University of Missouri, Columbia, MO

FRI-561 Initial Screening of Pomegranate Punicalagin for use in Intraarticular Osteoarthritis Therapy
Mark Mosher1, 2, Steven Elder1, 2, John Cramer1, 2, Hudson Cramer1, 2, and Paul Glotz1
1Mississippi State University, Mississippi State, MS; 2The Center for Advanced Vehicular Systems, Starkville, MS

FRI-562 3D Printed Orthodontic Scaffolding with Biomimetic Structure
Xuan Zhou1, Margaret Nowick1, and Lijie Zhang1
1The George Washington University, Washington, DC

POSTER SESSION—FRIDAY
Poster Viewing with Authors & Refreshment Break | 9:30 am—10:15 am and 2:45 pm—3:30 pm
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POSTER SESSION—FRIDAY

Friday, October 13 | 9:30 am–5:00 pm | Exhibit Hall 300 North
Poster Viewing with Authors & Refreshment Break | 9:30 am–10:15 am and 2:45 pm–3:30 pm

Track: Orthopedic and Rehabilitation Engineering

FRI-570 A Clinical Gait Analysis of Below Knee Amputee Fit With Mercer Universal Prosthesis
Ha Vu, Lawrence Webb1, Edward O'Brien1, Richard Kun1, Trung Le1, Ngoc Bich Nguyen1, Trung Le1, Ha Vo1, and Lawrence Webb1
1Mercer University, Macon, GA

FRI-571 The Effect of Focal Offload Size Within a 3D Printed Orthotic Material on Pressure Distribution
Kyle Walker1, Shannon Hall1, Brena Prasad2, Katalyn Ragland1, Meredith Owen1, Brian Kalaf1, Timothy Proist1, Steven Hoffner1, and John DesJardins1
1Clemson University, Central, SC, 2Clemson University, Clemson, SC, 3Ability Prosthetics & Orthotics, Greenville, SC

FRI-572 Biomechanical Comparison of Augmented Glenoid Implant Designs: A Finite Element Analysis
Liyang Zhang1, Yanan Pathak1, James Whaley1, and Vani Sabesan1
1Wayne State University, Detroit, MI

FRI-573 The Effect of Gel Liner Materials on Changes in Peak Pressures and Pressure Gradients
Mercedeh Owen1, Kara Danforth1, Kyle Walker1, Shannon Hall1, and John DesJardins1
1Clemson University, Clemson, SC

FRI-574 Controlling Degradation of a Magnesium Based Metal for Fixed Alignment Applications
Michael Skey1, Jared Go6, Justin Buechner1, Thomas Bailey1, Devin Boren1, Ziyi Liu1, C Liu1, and Dale Feldman1
1University of Nebraska-Lincoln, Lincoln, NE, 2University of Alabama at Tuscaloosa, AL, 3UAB, Birmingham, AL

FRI-575 Fatigue Analyses of Knee Insert Knobs for Total Knee Replacement
Narayana Kuppuraju1, Ertan Buhay1, Isadora Kawani1, and H. Felix Lee1
1Southern Illinois University Edwardsville, Edwardsville, IL, 2Inonu University, Malatya, Turkey

FRI-576 Adverse Effect of CoCrMo Wear Particles on Human Osteoblast Cells
Pooyina Vellanawasudha1, Doya Bijukumar1, and Mathew Mathew1
1University of Illinois, College of Medicine at Rockford, Rockford, IL

Track: Orthopedic and Rehabilitation Engineering, Biomechanics

FRI-577 The Pull-out Strength of Cortical Screw in Different Angle Configurations on Cadaveric Tibia Bone
Bich Nguyen1, Trung Le1, Ha Vu1, and Lawrence Webb1
1Mercer University, Macon, GA, 2Navicent Health, Macon, GA

FRI-578 Morphotrophic, Mechanical, and Histological Characterization of the Ligaments of the Trapeziusmetacarpal Joint
Chunhui Niu1, Junren Long1, Josie Gomez1, Mahmoud Reda Tah1, and Deena Mercaro1
1University of New Mexico, Albuquerque, NM

FRI-579 Lower Body Gait Kinematics in Mild-to-Moderate vs. Severe Osteogenesis Imperfecta in Southeastern Asia
Nikit Kurapati1,2,3, Rebecca Boerigter1, CarloSumaciga1, Joyce Abiera1, Melanie Alcausin4, 5, Peter A. Smith3, and Gerald Harris1,2
1Marquette University, Milwaukee, WI, 2Medical College of Wisconsin, Milwaukee, WI, 3Shiners Hospitals for Children-Chicago, Chicago, IL, 4Philippine General Hospital, Manila, Philippines

FRI-580 Rib Plate With Angled Monocortical Screws Has Pull-out Strength Equivalent to Bicortical Screw-Plate
Glaumajoji-Oladje1, Raymond Dunn1, and Kirsten Billiar1
1Wayne State University, Detroit, MI

FRI-581 The Effect of Simulated Rotator Cuff Tear Size on Glenohumeral Joint Force and Muscle Compensation
Richard A. Arce1 and Megan E. Vidi1
1University of Arizona, Phoenix, AZ

FRI-582 Buckling Behavior of Spinal Anesthesia Needles
Tessa Hult1, Jessica Booth1, Peter Pan1, and Philip Brown1
1Wake Forest School of Medicine-Virginia Polytechnic Institute, Winston Salem, NC, 2Wake Forest Baptist Health, Winston Salem, NC

FRI-583 A Comparison Pullout Strength Between Locking Screw and Non-locking Screw: A Biomechanical Study of Fresh Frozen Cadaver
Ting Li1, Robert Nagni1, William Mitt1, and Liz Le1
1Mercer University, Macon, GA, 2Philadelphia College of Osteopathic Medicine-Georgia Campus, Suwanee, GA

Track: Orthopedic and Rehabilitation Engineering, Biomechanics: Orthopedic: Mechanobiology and Mechanotransduction

FRI-584 Development of an In Vitro Bone-Tendon-Muscle Explant Culture Model
Brianne K. Connors1, Hannah M. Zlotnick1, John M. Drago1, and Alan J. Grodzinsky1
1The George Washington University, Washington, DC, 2University of Delaware, Newark, DE

FRI-585 Long Term Wear of Novel 3D-Printed Foot Orthoses
Breanne Prasad1, Katelyn Ragland1, Shannon Hall1, Kyle Walker1, Tim Prisant1, Steve Hoffner1, Brian Kalaf1, Nicole Hooks1, Dan Ballard1, and John DesJardins1
1Clemson University, Clemson, SC, 2Ability Prosthetics & Orthotics, Greenville, SC, 3Upstate Pedorthics, Greenville, SC

FRI-586 Biomechanical Investigation of Ibuprofen Treatment of Murine Achilies Tendinopathy
Sabah Rezvani1,2,3, Adam Bitterman1, Jun Li1, George Holmes1, Johnny Lo1, Simon Lee1, Anna Plass1, and Vincent Wang1
1Virginia Tech, Blacksburg, VA, 2Northwell Health, Huntington, NY, 3Rush University, Chicago, IL

FRI-587 Medial Tibial Plateau Cartilage Compression during a Closed-Chain Flexion Task
Stephanie Willmar1, Elizabeth Bottorff1, and April Chambers1
1University of Pittsburgh, Pittsburgh, PA

FRI-588 In vitro Models for the Guidance of Rehabilitation Regimens that Promote Cartilage Regeneration after Repair Surgery
Tomoya Ito1,2,3, Shihuda Kitahara1, Hiroshi Sokai1, Shinichi Yoshida1, Freddie Fu1, Rocky Tuan1, and Riccardo Gottardi1
1University of Pittsburgh-Pittsburgh, PA, 2Nihon College of Medicine, Nishinomiya City, Japan

Track: Stem Cell Engineering, Orthopedic and Rehabilitation Engineering

FRI-589 NANO Restores the Myogenic Differentiation Potential of Senescent Myoblasts
Aref Shahini1, Debark Choudhury1, Mohammadnabi Ahamdi1, Rupang Zhao1, Pedra Lei1, and Stelios Andreadis1
1University of Buffalo, Buffalo, NY

FRI-590 Muscle Satellite Cells from Non-pathological Tissue Exhibit Stress-Dependent Behaviors Not Observed in Cells from Patients with Cerebral Palsy
Stephanie Yeager1, Rebecca Scott1,2, and Robert Alkm1
1Nemours Alfred I. duPont Hospital for Children, Wilmington, DE, 2University of Delaware, Newark, DE

FRI-591 3D Bioprinted Cartilage Scaffold for Improved Human Bone Marrow Mesenchymal Stem Cell Differentiation
Wei Zhu1, Hanlin Cui1, Benchou Bousain1, Fahad Masood1, and Liise Grace Zhang1
1The George Washington University, Washington, DC, 2University of Maryland College Park
FRI-599  
**Thermal Interventions in 3D Cultured Osteoblasts to Impede Tumorigenicity**  
Jessica DuHamel1, Michelle Dube2, Elizabeth Vos2,3,4,5,6,  
*1School of Biomedical Sciences, Arizona State University, Tempe, AZ, 2Veterans Affairs Medical Center Phoenix, Phoenix, AZ, 3Americares, Norwalk, CT, 4Astellas, Waltham, MA, 5Johns Hopkins University, Baltimore, MD, 6Wayne State University, Detroit, MI*

FRI-600  
**In Vitro and In Vivo Studies of the Healing of Cerebral Depression**  
Emil Dinh1,2, Matthew Freeman1,2, Karyn E. Edlund3,4,  
*1University of Pennsylvania, Philadelphia, PA, 2Children’s Hospital of Philadelphia, Philadelphia, PA, 3Nanomedicine, University of Texas Medical Branch, Galveston, TX, 4University of Arizona, Tucson, AZ*

FRI-601  
**Cell-Cell and Cell-Matrix Engagements at the Site of Bone and Brain Injuries**  
Issac Shafer1,2,3, Nima Ghasemipour1,2,3,4,  
*1University of Minnesota, Minneapolis, MN, 2Benaroya Research Institute, Seattle, WA, 3University of Texas at Austin, TX, 4National Institute of Neurological Disorders and Stroke (NINDS), Bethesda, MD*

FRI-602  
**A Novel Biologically Inspired Material for Bone Regeneration**  
Rory F. Klemm1,2,3, Jennifer A. Hudek1,  
*1Northwestern University, Evanston, IL, 2Abstract Sessions, Chicago, IL, 3Northwestern University, Chicago, IL*

FRI-603  
**A Novel Brain Tissue Engineering Model for Spinal Cord Injury**  
Robert Moritz1,2,3,4,5,  
*1Columbia University, New York, NY, 2New York University, New York, NY, 3New York Eye and Ear Infirmary, New York, NY, 4New York Medical College, Valhalla, NY, 5Mount Sinai School of Medicine, New York, NY*

FRI-604  
**A Novel Hydrogel for Intracranial Tumor Treatment**  
Sara Elheiti1,2,3, Ahmed Mostafa1,2, Goher A. Ali1,2,  
*1Temple University, Philadelphia, PA, 2University of Pennsylvania, Philadelphia, PA, 3Drexel University, Philadelphia, PA*

FRI-605  
**A Novel Hydrogel for Intracranial Tumor Treatment**  
Sara Elheiti1,2,3, Ahmed Mostafa1,2, Goher A. Ali1,2,  
*1Temple University, Philadelphia, PA, 2University of Pennsylvania, Philadelphia, PA, 3Drexel University, Philadelphia, PA*

FRI-606  
**A Novel Hydrogel for Intracranial Tumor Treatment**  
Sara Elheiti1,2,3, Ahmed Mostafa1,2, Goher A. Ali1,2,  
*1Temple University, Philadelphia, PA, 2University of Pennsylvania, Philadelphia, PA, 3Drexel University, Philadelphia, PA*

FRI-607  
**A Novel Hydrogel for Intracranial Tumor Treatment**  
Sara Elheiti1,2,3, Ahmed Mostafa1,2, Goher A. Ali1,2,  
*1Temple University, Philadelphia, PA, 2University of Pennsylvania, Philadelphia, PA, 3Drexel University, Philadelphia, PA*

FRI-608  
**A Novel Hydrogel for Intracranial Tumor Treatment**  
Sara Elheiti1,2,3, Ahmed Mostafa1,2, Goher A. Ali1,2,  
*1Temple University, Philadelphia, PA, 2University of Pennsylvania, Philadelphia, PA, 3Drexel University, Philadelphia, PA*

FRI-609  
**A Novel Hydrogel for Intracranial Tumor Treatment**  
Sara Elheiti1,2,3, Ahmed Mostafa1,2, Goher A. Ali1,2,  
*1Temple University, Philadelphia, PA, 2University of Pennsylvania, Philadelphia, PA, 3Drexel University, Philadelphia, PA*

FRI-610  
**A Novel Hydrogel for Intracranial Tumor Treatment**  
Sara Elheiti1,2,3, Ahmed Mostafa1,2, Goher A. Ali1,2,  
*1Temple University, Philadelphia, PA, 2University of Pennsylvania, Philadelphia, PA, 3Drexel University, Philadelphia, PA*

FRI-611  
**A Novel Hydrogel for Intracranial Tumor Treatment**  
Sara Elheiti1,2,3, Ahmed Mostafa1,2, Goher A. Ali1,2,  
*1Temple University, Philadelphia, PA, 2University of Pennsylvania, Philadelphia, PA, 3Drexel University, Philadelphia, PA*

FRI-612  
**A Novel Hydrogel for Intracranial Tumor Treatment**  
Sara Elheiti1,2,3, Ahmed Mostafa1,2, Goher A. Ali1,2,  
*1Temple University, Philadelphia, PA, 2University of Pennsylvania, Philadelphia, PA, 3Drexel University, Philadelphia, PA*

FRI-613  
**A Novel Hydrogel for Intracranial Tumor Treatment**  
Sara Elheiti1,2,3, Ahmed Mostafa1,2, Goher A. Ali1,2,  
*1Temple University, Philadelphia, PA, 2University of Pennsylvania, Philadelphia, PA, 3Drexel University, Philadelphia, PA*

FRI-614  
**A Novel Hydrogel for Intracranial Tumor Treatment**  
Sara Elheiti1,2,3, Ahmed Mostafa1,2, Goher A. Ali1,2,  
*1Temple University, Philadelphia, PA, 2University of Pennsylvania, Philadelphia, PA, 3Drexel University, Philadelphia, PA*

FRI-615  
**A Novel Hydrogel for Intracranial Tumor Treatment**  
Sara Elheiti1,2,3, Ahmed Mostafa1,2, Goher A. Ali1,2,  
*1Temple University, Philadelphia, PA, 2University of Pennsylvania, Philadelphia, PA, 3Drexel University, Philadelphia, PA*

FRI-616  
**A Novel Hydrogel for Intracranial Tumor Treatment**  
Sara Elheiti1,2,3, Ahmed Mostafa1,2, Goher A. Ali1,2,  
*1Temple University, Philadelphia, PA, 2University of Pennsylvania, Philadelphia, PA, 3Drexel University, Philadelphia, PA*

FRI-617  
**A Novel Hydrogel for Intracranial Tumor Treatment**  
Sara Elheiti1,2,3, Ahmed Mostafa1,2, Goher A. Ali1,2,  
*1Temple University, Philadelphia, PA, 2University of Pennsylvania, Philadelphia, PA, 3Drexel University, Philadelphia, PA*

FRI-618  
**A Novel Hydrogel for Intracranial Tumor Treatment**  
Sara Elheiti1,2,3, Ahmed Mostafa1,2, Goher A. Ali1,2,  
*1Temple University, Philadelphia, PA, 2University of Pennsylvania, Philadelphia, PA, 3Drexel University, Philadelphia, PA*

FRI-619  
**A Novel Hydrogel for Intracranial Tumor Treatment**  
Sara Elheiti1,2,3, Ahmed Mostafa1,2, Goher A. Ali1,2,  
*1Temple University, Philadelphia, PA, 2University of Pennsylvania, Philadelphia, PA, 3Drexel University, Philadelphia, PA*
FRI-424 Effects of Fact joint Degeneration on Stress Application in Cervical Spine C5-6: A Finite Element Analysis
Huizhang Wang1,2, Kuan Wang2,3, Zhen Deng1,4, Hongsheng Zhan1,2, and Yi-Kuan Qin1
Shanghai, China, People’s Republic of, 1Shanghai Academy of TCM, Shanghai, China, People’s Republic of, 2Shanghai Jiaotong University, Shanghai, China, People’s Republic of, 3Shanghai Jiaotong University, Shanghai, China, People’s Republic of, 4Stony Brook University, Stony Brook, NY

FRI-425 Epigenome Targeting Gene Therapies for Disc Degeneration
Nikoloz Parfian’i, Martin Jensen1, Brandon Lawrence1, Harris Chandel2, and Robby Bowles1
1University of Utah, Salt Lake City, UT, 2Rho Biopharma, Salt Lake City, UT

FRI-426 Hypertrophic Degeneration of Human Cartilage Endplate Cells Promotes Catabolism and Expression of Pain Predictors in Disccogenic Back Pain
Taylor Deeter1, Katherine Lakstins1, Safdar Khan1, William Marras1, and Devina Purmessur1
1Arizona State University, Tempe, AZ

FRI-430 Inverse Dynamic Analysis of Knee Contact Loads for ACL Reconstruction Patients During Gait and Cycling
Katherine M. Reimann1, Megan Putzinger1, Scott H. Schuck1,2, Scott Hazlitt1,3, and Stephen Kloss1
1Case Western Reserve University, Cleveland, OH, 2University of South Florida, Tampa, FL, 3California State Polytechnic University, Pomona, CA

FRI-431 Automatically Detecting Destabilizing Wheelchair Conditions and Applying Electrical Stimulation to Maintain Seated Posture
Kiley Armstrong1,2, Masou Asl1, and Ronald Tasto1,2
1Case Western Reserve University, Cleveland, OH, 2Louis Stokes Cleveland VA Medical Center, Cleveland, OH

FRI-432 Touch Screen Application in a Stroke Rehabilitation
Kostantyn Shcherbina1, Erin Schul1, Omar Sangid1, Zepher Begnell1, Wiliam Joner1, and Michelle Harris-Love1
1University of Utah, Salt Lake City, UT

FRI-433 Are Ankle-Foot-Orthoses (AFOs) Contributing to Falls?
Massoud Nevisipour1 and Claire Honeycutt1
1Arizona State University, Tempe, AZ

FRI-434 The Impact of Asymmetrical Gaiting Throughout A gait Cycle
Matthew Dadey1, Kristen Currie1, Curtis Noyes1, and Christine Rollins1
1Arizona State University, Tempe, AZ

FRI-435 Sipaced Work on Treadmill Induces Higher Gait Adaptive Capacity in Healthy Individuals than that when Walking at Constant Speed
Rahul Soangra1, Sean Moon1, and Thurmon Lockhart1
1Arizona State University, Tempe, AZ, 2University of Arizona, Tucson, AZ

FRI-436 Effects of Military Rucksacks on Dynamic Stability
Seong Hyun Moon1, Rahul Soangra1, Chris Frames1, Victoria Smith1, Srinivasu Kallakuri1, Ke Feng1, and Todd Tarnow1
1University of Alabama at Birmingham, Birmingham, AL, 2University of Alabama at Birmingham, Birmingham, AL

FRI-437 Effect of Therapeutic Ultrasound on Postural Control and Fibularis Longus Corticospinal Excitabilities in Population with Chronic Ankle Instability
Takuya Suzuki1, Masahumi Terada1, Doki Tanjama1, Kohei Kasekatsu1, and Akira Nagano1
1Ritsumeikan University, Shiga, Japan

FRI-438 Analysis of Upper Limb Motor Loss Effects on Daily Living Activities
Tyler Wiercinski, Stephanie Carey1, and Noreen Palmeira1
1University of South Florida, Tampa, FL, 2California State Polytechnic University Pomona, Pomona, CA

FRI-439 Assessing Dynamic Stability and Motor Adaptation in Unanticipated Locomotor Transitions Using an Inverted Pendulum Model of Human Walking
Victoria Barrera1, Nathaniel Pickle1, and Nicholas Faye1
1The University of Texas at Dallas, Richardson, TX, 2The University of Texas Southwest Medical Center, Dallas, TX

Track: Biomechanics, Neural Engineering
Brain Biomechanics

FRI-632 Vibration of Skull and Cerebrospinal Fluid (CSF) Pressure in Noninvasive Intracranial Pressure Monitoring
Ashkan Eslaminejad1, Mohammad Hossein Farid1, Hosam Sanamhod Moghmad1, Marius Zwiep2, and Ghodrat Karami1
1Shanghai Jiaotong University, Shanghai, China, People’s Republic of, 2North Dakota State University, Fargo, ND

FRI-633 Development of In Vitro Platform to Investigate the Brain Wound Formation Attributed by BMI Eun Young Park1, Eunmin Ko1, and Jennifer H. Shin1
1Korea Advanced Institute of Science and Technology, Daejeon, Korea, Republic of

FRI-635 The Effect of Hydrostatic Pressure on Neuronal Cell Morphology in Vitro
Kalle Eriksen and Jin Negahban
1Clemson University, Clemson, SC

FRI-636 The Biomechanical, Histological and Computational Modeling Study of Brain Response to Free-Field Blasts
Liyong Zhang1, John Cavanaugh1, Srinivasu Kallakuri1, Ke Feng1, Tianxun An2, and Albert King1
1Wayne State University, Detroit, MI

FRI-637 Volumetric White Matter Changes due to Acute and Subconcussive Impacts in Football and a Traumatic Car Accident
Macieknie Tweedy1, Ikebosam Jang1, Eric Naum1, Tom Talevage1, and Larry Leaver1
1Purdue University, West Lafayette, IN

FRI-638 The Effect of Dyskinesia on Postural Stability: A Pilot Study
Merley Olson1, Victoria Smith1, and Christopher Frame1
1Case Western Reserve University, Cleveland, OH

FRI-639 An Examination of Brain Injury by Golf Ball Impacts
Mohammad Hossein Farid1, Ashkan Eslaminejad1, Mohammadreza Remmington1, Marius Zwiep2, and Ghodrat Karami1
1North Dakota State University, Fargo, ND, 2South Dakota State University, Aberdeen, SD

Track: Biomedical Engineering (BME) Dual & Ph.D.-Institution Programs

FRI-642 Leveraging on North-South Collaboration to Develop Biomedical Engineering Education and Practice in Nigeria
Akiniwe Coker1,3, Chuchu Djii1, Sunday Adegoke1, Abel Olorunmila2, David Ojecto1, Matthew Cikic1, and Robert Murphy
1University of Ilorin, Ilorin, Nigeria, 2Northwestern University for Global Health, Chicago, IL, 3Northwestern University, Chicago, IL

FRI-643 STIM Activities for Early Scouting
Diana Garcia Leon1 and Mariana Talav-Arciniegas1
1University of Los Andes, Bogota, Colombia

FRI-644 Immersing Biomedical Engineering Graduate Students into High School STEM Curricula: The IBMBE Discovery Program at the University of Toronto
Locke Davenport Huyer1, Genevieve Conant1, Cindy V. Bui1, Shafir Rizzardi1, Ben G. Krasilla1, Andrew Vaght1, Andrew Effat1, Janica Weng1, Neal Callaghan1, Brittany LAuten1, Andrea Y. Shukalyuk1, and Dawn M. Killen1
1University of Toronto, Toronto, ON, Canada

Track: Biomedical Engineering Education (BME), Undergraduate Research, Design & Leadership

FRI-645 Industrial Design of Medical Devices in a Master of Engineering Project Course
Alan Eberhardt1 and Shea Tillman2
1University of Alabama at Birmingham, Birmingham, AL, 2Auburn University, Auburn, AL

FRI-646 A Collaborative Approach to Enhancing Undergraduate and Graduate Curriculum by Engaging in New Content Building and Utilizing Research and Outreach Resources at the University of Toronto
Andrey Shukalyuk1
1University of Toronto, Toronto, ON, Canada

FRI-652 Using Course Design to Achieve Gender Equity in an Undergraduate STEM Course
Carlton Harris1, Edwen Haase1, and Harry Goldberg2
1Johns Hopkins University School of Medicine, Baltimore, MD, 2Johns Hopkins University, Baltimore, MD

BMES 2017 | Phoenix 219
BMES 2017 | Phoenix 218
Saturday, October 14 | October 14, 8:00 am–9:30 am | Platform Session 1

**OP-Sat–1–2**
**Room 224B**
**Track: Biomaterials**
**Drug Delivering Biomaterials IV**
Chair: Benet Danieli, Yuguang Lu

- **8:00 am** Reducing Implant Precipitation Rate for Deeper Vascular Occlusion
  Danielle Gilbert1, Satva Jeganathan1, Sindharth Swati1, and Agata Ester1
  *Case Western Reserve University, Cleveland, OH*
  *University Hospitals, Cleveland, OH*

- **8:15 am** IgA and IgM Protein Primarily Drive Plasma Corona-induced Adhesion Reduction of PLGA Nanoparticles in Human Blood Flow
  Daniel Sobczynski1 and Omolola Eniola-Adefeso1
  *University of Michigan, Ann Arbor, MI*

- **8:30 am** Bioactive Silica-based Nanospheres With Long-term Antibacterial Effects for Endodontic Sealing
  Abinash Padhi1 and Amrinder Nain1
  *Virginia Polytechnic Institute and State University, Blacksburg, VA*
  *Brown University, Providence, RI*
  *University of Michigan, Ann Arbor, MI*
  *Carnegie Mellon University, Pittsburgh, PA*

- **8:45 am** Imaging Techniques in Biomechanics
  Cherice Hughes-Oliver1, Divya Srinivasan1, and Robin Queen1
  *Northwestern University, Chicago, IL*
  *University of Alabama at Birmingham, Birmingham, AL*

- **9:00 am** Combating Candida albicans: Aspartic Protease-Triggered Hydrogels for Drug Delivery
  Noel Viera-Gonzalez1 and Anita Shukla1
  *Case Western Reserve University, Cleveland, OH*
  *University Hospitals, Cleveland, OH*

- **9:15 am** Full-Volume Strain Mapping and Mechanical Characterization of Anterior Cruciate Ligament Bundles
  Callan LuxKemeter1, Luyas Cal1, Corey Nau1, and Ellen Arruda1
  *University of Michigan, Ann Arbor, MI*
  *Purdue University, West Lafayette, IN*
  *University of Colorado Boulder, Boulder, CO*

**OP-Sat–1–4**
**Room 229B**
**Tracks: Biomechanics, Orthopedic and Rehabilitation Engineering**

**Rehabilitation Biomechanics**
Chair: Ashley Weaver

- **8:00 am** Sex-Specific Differences of Temporal Gait Patterns in Ankle Osteoarthritis Patients
  Chavika Hughes-Oliver1, Divya Srinivasan1, and Robin Queen1
  *Virginia Tech, Blacksburg, VA*

- **8:15 am** Passive Elastic Finger Joint Torques Change Minimaly in Moderately Impaired Individuals With Chronic Hemiparetic Stroke
  Benjamin Binder-Martin1,2, Julia PA Dawid1, and Wendy Murray1,2
  *Northwestern University, Chicago, IL*
  * Shirley Ryan AbilityLab, Chicago, IL*
  *Edward Hines, Jr. VA Hospital, Hines, IL*

- **8:30 am** Compensation in the Forelimb After Body Weight Supported Treadmill Training in Spinal Cord Injury Rats
  Anita Singh1, Gabrielle Gehlor1, Shania Shaj1, Brittany King1, Jacki Kruk1, and Jannette Kafile1
  *Widener University, Chester, PA*
  *Rowan Institution, Glassboro, NJ*

- **8:45 am** Quantification of Fluid Changes through Cardiac Muscle for the Development of a Biomechanical, Electrocardiographic, and Spectral Sensor
  Fayez Aruwaili1, Jacob Griffith1, Jeremy Patterson1, and Kim CLIFF2
  *Virginia Tech, Blacksburg, VA*
  *Wichita State University, Wichita, KS*

**OP-Sat–1–6**
**Room 221B**
**Tracks: Drug Delivery & Intelligent Systems, Nano and Micro Technologies**

**Nanobiodegradable Nanoparticle Delivery of Anti-Infective Tandem Peptides for Treatment of P. Aeruginosa Lung Infections**
Enzer J. Kenny1, Matthew Sklad1, Alessandro Burtuzzo1,2, Gary Braun1,3, Erikk Russahl1, Michael J. Salier1, and Sangeneta N. Bhatia1
*Massachusetts Institute of Technology, Cambridge, MA*
*University of California San Diego, La Jolla, CA*
*Sanford Burnham Prebys Medical Discovery Institute, La Jolla, CA*

- **9:00 am** Developing an Experimental Model for Detection of LVAD Pump Thrombus
  Ashley Jabouin1, ricardo Montes1, Janaya Salim1, VI Vu1, and karen May1
  *San Diego State University, San Diego, CA*

- **9:15 am** Dual-Penetrator Micro-pump for Pediatric Patients with Right Ventricular Dysfunction
  Alexandra Untarnosu1, Jak Jagen1, and Elizabeth Mack1
  *Virginia Tech, Blacksburg, VA*
Saturday, October 14 | 8:00 am—9:30 am | Platform Session 1

**Opp-Sat-1** Room 222A

**Track: Cellular and Molecular Bioengineering**

**Mechanobiology of Cell Adhesion**

Chairs: Kimberly Stroka, Renata Horton

8:00 am

Detecting Vinculin Load-Dependent Protein Recruitment to Focal Adhesions

Andrew LaCroix1 and Brenton Hoffman1

1Duke University, Durham, NC

8:15 am

P-selectin and ICAM-1 Synergy in Mediating THP-1 Monocyte Adhesion in Flow is Length Dependent

Erik Edwards1 and Susan Thomas1

1Georgia Institute of Technology, Atlanta, GA

8:30 am

Integrin Subtypes and Nasoscale Dimensionality Influence Chemoresistance in Breast Cancer Cells

Jennifer Young1, Heidi Samson1, Ximeng Hua1, Horst Kesl1, and Joachim Spatz1

1Max Planck Institute for Medical Research, Heidelberg, Germany

8:45 am

Calibrating and Mapping Integral Membrane Tensions in Single Platelets

Xiangyu Wang1, Yongji Wang1, and Dana LeVine1

1Iowa State University, Ames, IA

9:00 am

Mechanosensitive Cadherin Adhesion and its Regulation

Ramesh Koirala1, Chi Fu Ver1, Andrew Priest1, and Sanjeevi Sivasankar1

1Iowa State University, Ames, IA

9:15 am

Novel Role of Cadherin-11 In Cell Signaling Via Direct Interaction with the PDGF Receptor

Yuyu Liu1, Sindhu Row1, Sandeep Agarwal2, and Stelios Andreadis1

1Iowa State University, Ames, IA

1, Evan Alexander Scott1

9:15 am

Engineered T Regulatory Cells (Tregs) as a Multiple Sclerosis (MS) Therapeutic

Elissa Leonard1 and Jennifer Meynard1

1Northwestern University, Evanston, IL

9:00 am

Glycoengineering HIV Immunogens to Enhance the Binding Landscape for Humoral Immune Responses

Wen-Han Wu1, Ping Zhao1, Monia Draghi1, Claudia Arneodo1, Christina Kant2, Lance Wells2, Douglas Laufferher1, and David Alter1

1Boston University, Boston, MA

1, Evan Czako1, 2New Jersey Institute of Technology, Newark, NJ

1, Evan Czako1

9:00 am

Shear-Induced Formation of a Lamina Splendens-Like Gel from Synovial Fluid

Sierra Cook, Yu Guan, Cory Brown, Noah Paciolo, Evan Czako, and Dalphine Gourdon1

1Cornell University, Ithaca, NY

9:00 am

9:15 am

Role of Transport Phenomena in Establishing Chemokine Gradients in Lymph Nodes

Mariana Zgharda1, David Zawawi1, Bindu Bhaskar1, Robert Nick1, and James Moore1

1Imperial College London, London, United Kingdom

1, Evan Czako1

9:15 am

Sequential Cytokine Treatment Promotes Synovial Lubricant Synthesis and Reduces MMP Activity in Fibroblast Like Synoviocytes

Ahmad Abu-Hakmeh1, Allison Fleck1, and Leo Q. Wan1

1Rensselaer Polytechnic Institute, Troy, NY

9:15 am

Mitigation of Osteoarthritic Symptoms under Joint Alteration using Low Intensity Acoustic Radiation Force

XAMOLB Li1, Yuh Sun1, Zhulin Zhou1, Claudia Raza Hassan1, Dongye Zhang1, Minqi Hu1, and Yi-Xian Qian1

1Shanghai Jiao Tong University, Shanghai, China

1, Evan Czako1

9:15 am

Articular Cartilage, Meniscus and Joints

Chairs: Riccardo Gentile, Robert Sah

8:00 am

Point: Orthopedic and Rehabilitation Engineering

8:00 am

Plastic Designer for Carrier-Based CRISPR/Cas9 Based Genome Editing

Hong-Kea Wang1, Song Yu1, Hong-Kea Le1, Xin Xu1, Jing Gong1, Du Cheng1, Gunyuan Chakraborty1, Mingjiang Li1, Lichen Yin3, and Kailin Leung1

1Columbia University, New York, NY, 2University of Illinois at Urbana-Champaign, Urbana, IL, 3Soochow University, Suzhou, China, People’s Republic of

8:30 am

Detecting Vinculin Load-Dependent Protein Recruitment to Focal Adhesions

Andrew LaCroix1 and Brenton Hoffman1

1Duke University, Durham, NC

8:45 am

Detecting Vinculin Load-Dependent Protein Recruitment to Focal Adhesions

Andrew LaCroix1 and Brenton Hoffman1

1Duke University, Durham, NC

9:15 am

Dental Pulp Regeneration Using Novel Direct Interaction with the PDGF Receptor

Yuyu Liu1, Sindhu Row1, Sandeep Agarwal2, and Stelios Andreadis1

1Iowa State University, Ames, IA

9:15 am

Inflammatory Responses in Mouse Models of Atherosclerosis

Yu-Gang Liu1, Sean David Allen1, Sija Y1, and Evan Alexander Scott1

1Northwestern University, Evanston, IL

9:15 am

Engineered T Regulatory Cells (Tregs) as a Multiple Sclerosis (MS) Therapeutic

Elissa Leonard1 and Jennifer Meynard1

1Northwestern University, Evanston, IL

9:15 am

Glycoengineering HIV Immunogens to Enhance the Binding Landscape for Humoral Immune Responses

Wen-Han Wu1, Ping Zhao1, Monia Draghi1, Claudia Arneodo1, Christina Kant2, Lance Wells2, Douglas Laufferher1, and David Alter1

1Boston University, Boston, MA

9:15 am

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Mariana Zgharda1, David Zawawi1, Bindu Bhaskar1, Robert Nick1, and James Moore1

1Imperial College London, London, United Kingdom

9:15 am

Sequential Cytokine Treatment Promotes Synovial Lubricant Synthesis and Reduces MMP Activity in Fibroblast Like Synoviocytes

Ahmad Abu-Hakmeh1, Allison Fleck1, and Leo Q. Wan1

1Rensselaer Polytechnic Institute, Troy, NY

9:15 am

Articular Cartilage, Meniscus and Joints

Chairs: Riccardo Gentile, Robert Sah

8:00 am

Mitigation of Osteoarthritic Symptoms under Joint Alteration using Low Intensity Acoustic Radiation Force

XAMOLB Li1, Yuh Sun1, Zhulin Zhou1, Claudia Raza Hassan1, Dongye Zhang1, Minqi Hu1, and Yi-Xian Qian1

1Shanghai Jiao Tong University, Shanghai, China

8:30 am

Repeat Intra-Articular Injection of Zoledronic Acid Suppresses Cartilage Erosions After DMM

Michael Davis1, Melanie Smith1, Rachael Plachocki1, John Lawson1, and Christopher Price1

1University of Delaware, Newark, DE

8:45 am

Through-Thickess Patterns of Shear Strain Change with Progressively Osteoarthritic Human Cartilage

Franz Meier1, Courtland G. Lewis1, and David M. Pierce1

1University of Connecticut, Storrs, CT

9:00 am

Shear-Induced Formation of a Lamina Splendens-Like Gel from Synovial Fluid

Sierra Cook, Yu Guan, Cory Brown, Noah Paciolo, Evan Czako, and Dalphine Gourdon1

1Cornell University, Ithaca, NY

1, Evan Czako1

9:00 am

9:15 am

Cell-Secreted Extracellular Matrix Promotes Osteogenic Differentiation of Stromal Vascular Fraction

Jenna Hermaine1, Hakam Oribi2, Jonathan Chen1, David Sah1, and J. Kent Latch1

1University of California, Davis, Davis, CA

9:45 am

Cell-Secreted Extracellular Matrix Promotes Osteogenic Differentiation of Stromal Vascular Fraction

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1University of California, Davis, Davis, CA

9:00 am

Injectable Microribon-like Hydrogels for Stem Cell Delivery and Craniofacial Repair

Yashua Tang1, Ximing Tong1, and Fan Yang1

1Stanford University, Stanford, CA

9:15 am

Dental Pulp Regeneration Using Novel Self-Assembling Peptides

Peter Nguyen1, William Gao1, Saloni Patel1, Saul Wener2, and Vivek Kumar1

1New Jersey Institute of Technology, Newark, NJ

1, Evan Czako1

9:00 am

9:15 am

9:45 am

8:00 am

8:15 am

8:30 am

8:45 am

9:00 am

9:15 am
Saturday, October 14 | 8:00 am–9:30 am | Platform Session 1

**OP-Sat–1**

**Room 225A**

**Track: Nano and Micro Technologies**

**Advances in Micro/Nano Manufacturing**

Chairs: Maryam Motamed-Miremadi, Vladimir Roessler

8:00 am

**Acoustic Separation of Nanoparticles in Continuous Flow**

Joseph Robi1, Mengzi Wu2, Zengming Mao2, Lin Wang2, and Tony Huang1

1Duke University, Durham, NC, 2The Pennsylvania State University, University Park, PA, "Ascent Bio-Nano, Research Triangle Park, NC

8:15 am

**Flexible Nanotextured PDMS as a Substrate for Selective Cell Capture**

Mohammad R. Hasan1, Sai Santosh Saxena Peri1, Viraj Sabane2, Nuzer Mansouri1, Jean Gal1, Kyria Nguyen1, Jean Wendland1, Vinay Abhyankar6, and Samir Iqbal1

1University of Texas Arlington, Arlington, TX, 2Wake Forest Innovations, Winston-Salem, NC, 3Wake Forest Innovations, Winston-Salem, NC

8:30 am

**A Microfluidic Thermometer: Precise Temperature Measurements in Microfluidic Scale Volumes**

Brittney A. McKenzie1 and William H. Grover1

1University of California, Riverside, Riverside, CA

8:45 am

**Delivery of Undiluted Whole Blood in Microchannels Enabled by Acoustic-based Fluid Propulsion**

Po-Hsun Huang1, Hoa Nga Nguyen1, and Tony Jun Huang1

1Duke University, Durham, NC

9:00 am

**A Viscosity-Based Measurement System for Selective Cell Capture**

Mehrdad R. Hasan, Sai Santosh Saxena Peri, Viraj Sabane, Nuzer Mansouri, Jean Gal, Kyria Nguyen, Jean Wendland, Vinay Abhyankar, and Samir Iqbal

1University of Texas Arlington, Arlington, TX, 2Wake Forest Innovations, Winston-Salem, NC, 3Wake Forest Innovations, Winston-Salem, NC

8:15 am

**CloudPette: Cloud-Based Ultra-high-precision Microfluidic Pipetting**

Yongfan Mest1, Jannah Far1, Kun-Hao Teeng1, Yi Ding1, Yunfeng Ding1, Chweemong Tan1, and Tony Huang1

1University of California, Davis, Davis, CA

8:30 am

**Retrospective Predictors of Mortality in an Enterocutaneous Fistula Population at a Tertiary Medical Center**

Alyssa Rolland1, Stephen Walker1, Philip Johnson1, Russ Wattman1, and Sara Wilson1

1University of Kansas, Lawrence, KS, 2University of Kansas Medical Center, Kansas City, KS

8:45 am

**Development of a Novel Bipolar Radiofrequency Ablation Device for Ablation of Post-excision Surfaces and Summary of Performance in Ex Vivo and In Vivo Soft Tissues**

Tyler Warner1, Alyssa Bailey1, Thomas Kurth2, Ryan Bean1, Terence Chan1, Michelle Hassel1, Curtis Wang1, Anna Sorens1, Robert Risout1, and Roberta Lee1

1Northwestern University, Chicago, IL, 2Innovative Designs, Inc., Chicago, IL, 3University of Illinois, Chicago, IL, 4Northwestern University, Evanston, IL

9:00 am

**Design and Fabrication of Indigenous Phototherapy Equipment for Treating Neonatal Jaundice in Nigeria**

Akintunde Coker1, Muyiwa Sidi1, Hammed Tees1, and Akintunde Chukwu

1University of Ilorin, Ilorin, Nigeria

9:15 am

**High-throughput Microtechnologies for Transient Profiling of Molecular Signatures during Neutrophil Swarming**

Eduardo Reategui1, Joe Jiang2, Aliza Hopley1, Fatemeh Jalali1, Maedeh Roushan2, Jasmond Dalit1, Charles N. Serhan1, Patrick S. Doyle2, and Daniel Irimia4

1Virginia Tech-Wake Forest School for Biomedical Engineering Sciences, Winston-Salem, NC, 2Wake Forest Innovations, Winston-Salem, NC

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Akintunde Coker1, Muyiwa Sidi1, Hammed Tees1, and Akintunde Chukwu

1University of Ilorin, Ilorin, Nigeria

9:15 am

**High-throughput Microtechnologies for Transient Profiling of Molecular Signatures during Neutrophil Swarming**

Eduardo Reategui1, Joe Jiang2, Aliza Hopley1, Fatemeh Jalali1, Maedeh Roushan2, Jasmond Dalit1, Charles N. Serhan1, Patrick S. Doyle2, and Daniel Irimia4

1Virginia Tech-Wake Forest School for Biomedical Engineering Sciences, Winston-Salem, NC, 2Wake Forest Innovations, Winston-Salem, NC

8:15 am

**CloudPette: Cloud-Based Ultra-high-precision Microfluidic Pipetting**

Yongfan Mest1, Jannah Far1, Kun-Hao Teeng1, Yi Ding1, Yunfeng Ding1, Chweemong Tan1, and Tony Huang1

1University of California, Davis, Davis, CA

8:30 am

**Retrospective Predictors of Mortality in an Enterocutaneous Fistula Population at a Tertiary Medical Center**

Alyssa Rolland1, Stephen Walker1, Philip Johnson1, Russ Wattman1, and Sara Wilson1

1University of Kansas, Lawrence, KS, 2University of Kansas Medical Center, Kansas City, KS

8:45 am

**Development of a Novel Bipolar Radiofrequency Ablation Device for Ablation of Post-excision Surfaces and Summary of Performance in Ex Vivo and In Vivo Soft Tissues**

Tyler Warner1, Alyssa Bailey1, Thomas Kurth2, Ryan Bean1, Terence Chan1, Michelle Hassel1, Curtis Wang1, Anna Sorens1, Robert Risout1, and Roberta Lee1

1Northwestern University, Chicago, IL, 2Innovative Designs, Inc., Chicago, IL, 3University of Illinois, Chicago, IL, 4Northwestern University, Evanston, IL

9:00 am

**Design and Fabrication of Indigenous Phototherapy Equipment for Treating Neonatal Jaundice in Nigeria**

Akintunde Coker1, Muyiwa Sidi1, Hammed Tees1, and Akintunde Chukwu

1University of Ilorin, Ilorin, Nigeria

9:15 am
Saturday, October 14 | 8:00 am–9:30 am | Platform Session 1

8:45 am
Interrogation of Muscle Stem Cell-Niche Interactions Using Artificial 3D Micro-Gels and Single-Cell Sequencing
Andrea De Micheli, Sharon Baumgarten-Sowle, Franci Chen, Brenton Munson, and Benjamin Giesecke
'University of California, Ithaca, NY

9:00 am
A Notch Positive Feedback Controlling Intestinal Stem Cell Niche Patternning
Kai Yuan Chen, Tera Srinivasan, Kai-Ling Tung, Pengcheng Bu, and Xiling Shen
'Duke University, Durham, NC, 'Cornell University, Ithaca, NY

9:15 am
Comprehensive Mapping of Pluripotent Stem Cell Metabolism using Dynamic Genome-scale Network Modeling
Sitran Chandrasekaran, Jin Zhang, George Daley, and James Collins
'University of Michigan, Ann Arbor, MI, 'Harvard Medical School, Boston, MA, 'MIT, Cambridge, MA

OP-Sat-1-16 Room 226A
Track: Bioinformatics, Computational and Systems Biology
Systems Biology of Infectious Disease
Chairs: Kelly Amlot, Priya Shah

8:00 am
A Systems Approach to Elucidate Mechanisms of HIV Control
Jiahui Du1, Jessica Sass1, Max Mangino2, Sean O’Keeffe2, Douglas Lauffenburger2, and Gert Alber1
'Massachusetts Institute of Technology, Cambridge, MA, 'Harvard Medical School, Boston, MA, 'MIT, Cambridge, MA

8:15 am
Quantifying Lenticival Reactivation Across Individual Genomic Integration Sites
Amaral Pajé and Leor Weinberger
'Gladstone Institutes and UCSF, San Francisco, CA

8:30 am
Eradicating M. tuberculosis Persisters
Jason Young1, Meagan Hamble1, Sarah Wright1, and James Collins1
'University of Michigan, Ann Arbor, MI, 'Harvard Medical School, Boston, MA, 'MIT, Cambridge, MA

8:45 am
Surrogate-assisted Optimization Can Locate Optimal Tuberculostatic Antibiotic Treatment Regimens
Joseph Cochrane1, Elsie Pierrard1, Denise Kirstchner1, and Jennifer Linderman1
'University of Michigan, Ann Arbor, MI, 'University of Michigan Medical School, Ann Arbor, MI

9:00 am
Emergence and Selection of Antibiotic Resistance in Tuberculosis
Elise Pierrard1, Denise Kirstchner1, and Jennifer Linderman1
'University of Michigan, Ann Arbor, MI

9:15 am
Experimental Design in the Context of Bacterial Strain Identification
Caroline Zhang and Long Liang You
'Duke University, Durham, NC

OP-Sat-1-17 Room 226B
Tracks: Neural Engineering, Device Technologies and Biomedical Robotics
Neural Device-Tissue Interfaces
Chairs: Takashi Koaze, Erin Purcell

8:00 am
Investigating the Role of Inflammation in the Functionality of Intracellular Devices
Janak Gan1, Heui Chang Lee1, Nicholas L. Hilborn1, Mary K. Regan1, and Kevin J. Otto1
'University of Florida, Gainesville, FL, 'University of Texas Southwestmedic Medical Center, Dallas, TX

8:15 am
Quantitative Mapping of Tissue Oxygenation Around Neural Interfaces Using Novel PISTOL MR Imaging
James Beachamp2, Jordan Karimi1, Nuntawadee J. Jaysave1, Anat. Sridharan1, Vikram D. Kookbuar2, and Jit Motheuswamy3
'Arizona State University, Tempe, AZ

8:30 am
Melatonin Injection Improves Quality and Longevity of Chronic Neural Recording
Aiyep Godbold1, Patrick Cody1, Erin Wilt1, Takashi D. Y. Kozai2,3, and A. Tracy Cul2
'University of Pittsburgh, Pittsburgh, PA, 'Center for the Neural Basis of Cognition, Pittsburgh, PA, 'McGowan Institute for Regenerative Medicine, Pittsburgh, PA, 'Neural Center of the University of Pittsburgh Brain Institute, Pittsburgh, PA

8:45 am
Electrical Evaluation of Micro-Electrode Arrays Coated with Thin Films for Minocycline Release
Katelyn Otis1, Matthew McDermott1,2, and Kevin O’Doh1
'University of Florida, Gainesville, FL, 'Purdue University, West Lafayette, IN

9:00 am
Evaluation of Impedance and In Vivo Recording Performance of Extracellular Matrix-Coated Neural Microelectrodes
Flavia Vitale1, Wendy Shen1, Nicollete Driscoll2, Andrew G. Richardson1, Brendan Murphy1, Akhshay Aranthakrishnan1, Justin Burnet1, Madhaya Alweide3, Timothy H. Lu1, Mark K. Cullen1, and Brian Litt1
'University of Pennsylvania, Philadelphia, PA, 'Brown University, Providence, RI

9:15 am
Ultra-flexible Brain Probes Form Reliable, Glial Scar Free Neural Integration
Zhenghao Zhai1, Lan Luan1, Xuejing Wei2, Shanshui Wang1, Jennifer Siegel1, Shams Kazi3, Robert Fowler1, Andrew Dunn1, Raymond Chitwood1, and Chang Xu1
'University of Texas at Austin, Austin, TX

Saturday, October 14 | 8:00 am–9:30 am | Platform Session 1

8:54 am
Tension Simulating Ligament Loading Induces Changes in Neuronal Morphology Even at Strain Below Those Sustained in Painful Injury
Alejandro Villamayor1, Meagan Ira1, Sagar Singh1, and Beth Winkelstein2
'University of Pennsylvania, Philadelphia, PA

9:03 am
Investigating Cholera Toxin Infection During Pregnancy Using an In Vitro Placental Model
Tanaya Parandi1, Christina Bailey1, and Anita Shukla1
'Brown University, Providence, RI

9:12 am
A Hybrid Model of Tumor Angiogenesis: Theory and Simulations
Cathy Philpott1, Matthew Gadda1, Tessa Davis1, Thomas Yankelowitz1, J. Trevisy Olad1, and Ernesto Lima1
'The University of Texas at Austin, Austin, TX

9:21 am
Whole-Body Mathematical Models of Synthetic Biosensing Liposomes: An Application for the Prevention of Metastasis
Tatashi Abraham1 and Cheemeng Tan1
'University of California, Davis, Davis, CA

SPECIAL SESSION

8:00 am–9:30 am Room 121ABC
BMES-NSF Special Session on Graduate Research Fellowships Program
Chair: Michele Gomes
BMES and the National Science Foundation (NSF) will convene a special session focused on NSF's Graduate Research Fellowship Program (GRFP). The goal of the session is to bring together program officers, grantees, reviewers and graduate students to highlight the NSF-GRFP and inform undergraduate and graduate students on GRFP guidelines and strategies to develop winning GRFP grant proposals. This material is based upon work supported by the National Science Foundation under Grant No. CBET-1741771. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.
Acid-Based Hydrogels

Kerim Gattas-Asfura 1, Nicholas Abuid1

Generation of Ultrathin Polymeric Coatings on Silane-Functionalized Dendrimer for the Multicellular Assemblies of Salivary Stem/Conductivity and Mechanical Properties

Ankita Bhat1, Blake Smith1, Anthony Guiseppi-Elie1, and (Hema) Hydrogels

Distribution, Impedance and Modulus of Poly (Hema) Hydrogels

Ehsan Shirzaei Sani1, Devyesh Rana1, Roberto Portillo Lara1,2, Jessie Gifford1, Blake Smith1, Anthony Guiseppi-Elie1, and Thomas Scheibel1

Biocompatible three-Dimensional Hydrogels for Chronic Wound Healing

Shah Shrestha1, Sanjeev Rastogi1, Alejandro Almarza, Kristyn Masters1, and Cherie Stabler1

A Brain ECM Mimicking Hydrogel

Tamaras B. Aigner1, Jana Petzold2, Kristin Schacht1, Elise K. DeSimone1, Alejandro Almarza, Kristyn Masters1, and Cherie Stabler1

Silicone Hydrogel Biomaterials I

OP–Sat–2–1

Opener: Biomaterials

Chair: Alejandro Almarza, Kristyn Masters

1:30 pm

Fabrication of Polyethylene Glycol-based Templated Macroporous Hydrogels for Cell Encapsulation

Moahbeh Jaminnehad1, Grant Kolar1, and Siliya Zuahtsali1

Saint Louis University, St. Louis, MO

1:45 pm

Elastic and Antimicrobial Gelatin/Tropeolaestin Hydrogels for Chronic Wound Healing

Shah Shrestha1, Sanjeev Rastogi1, Alejandro Almarza, Kristyn Masters1, and Cherie Stabler1

1:30 pm

Nasim Annabi1, Cerasela Zoica-Dinu 2

1Northeastern University, Boston, MA, 2Tecnológico de Monterrey, Monterrey, Mexico, 3University of Sydney, NSW, Australia, 4Brigham and Women's Hospital, Boston, MA

2:00 pm

Minor Aema/Dmaea Inclusion Influences Water Distribution, Impedance and Modulus of Poly (Hema) Hydrogels

Amrika Bhat1, Blake Smith1, Anthony Guiseppi-Elie1, and Carmen Zvika Ortu1

Center for Bioelectronics, Biosensors and Biochips (C 3B), Texas A&M Institute of Technology, Cambridge, MA

2:15 pm

Engineering Hydrogels with Tunable Conductivity and Mechanical Properties

Brian Walker1, Roberto Portillo Lara1, Ethan Shirzaei San1, and Naom Anmada1, 2

1Northeastern University, Boston, MA, 2Tecnológico de Monterrey, Monterrey, Mexico, 3University of Sydney, NSW, Australia, 4Brigham and Women’s Hospital, Boston, MA

OP–Sat–2–2

Track: Biomaterials

Natural and Bioinspired Biomaterials I

Chair: Edward Phelps, Jing Yu Lim

1:30 pm

NO-Releasing Polymer Combined with Covalently-Bound Polywittetron For Antimicrobial Applications

Priyadarsini Singh1, Qiaohong Liu1, Jason Locklin1, and Hitesh Handa1

1The University of Georgia, Athens, GA

1:45 pm

Endothelial Cell Function in Liquid-Based Anti-thrombotic Surface Coating

Hunghes Chu1, Jaipal Yar1, Tsuo Zhang1, Mithapan Yip1, Mououm Ohera1, James Min1, Simon Durham1, and Bijal Mosabedi1

Wellcome Medicine, New York, NY

2:00 pm

Engineered Fibre Vehicles to Drive Wound Healing Potential of Mesenchymal Stem Cell Spheroids

Katlin Murphy1, Jacklyn Whitehead1, Deji Zhou1, Steve Ho1, and J Kent Lewis1

1University of California, Davis, Davis, CA, 2University of California, Davis Health, Sacramento, CA

2:15 pm

Engineered Spider Silk Protein Scaffolds for Controlled Cell Interaction

Tamaras B. Aigner1, Jana Petzold2, Kristin Schacht1, Elise K. DeSimone1, Alejandro Almarza, Kristyn Masters1, and Cherie Stabler1

1:30 pm

A Brain ECM Mimicking Hydrogel

Suelynath Galera1, Christopher Hall1, and Shelly Peyton1

1University of Massachusetts Amherst, Amherst, MA

2:30 pm

Molecularly Imprinted Polymer-Peptide Hybrid Materials for the Recognition and Sequestration of Proteins

John Cligg1, Joaquin Gut1, Matthew Harger1, Pengyu Ren1, and Nicholas Peppas1

1University of Texas at Austin, Austin, TX

2:45 pm

Silane-Functionalized Dendrimer for the Generation of Ultrathin Polymeric Coatings on Pancreatic Islets

Kerin Gates-Arthur1, Nicholas Abuid1, and Cherie Stabler1

1University of Florida, Gainesville, FL

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BMES 2017 Phoenix 231
Platform Session 2—1:30 pm—3:00 pm

**OP-Sat-2-9 Room 222B**

**Track: Cellular and Molecular Bioengineering**

**Molecular and Cellular Immunomodulation**

- Chairs: James Spangler, Keyue Shan
- **1:30 pm**
  - **Dendritic Cell Priming in Heterogeneous Cultures Modulates Phenotype and Function for Immunotherapy**
  - Hannah Frizzell, Jungyeong Park, Natsuki Liu-Comandante, and
  - Kim A. Woodrow, Jeffrey Young, Park, College Park, College Park, MD, 3Department of Microbiology, MD, 5United States Department of Veterans Affairs, Baltimore, MD

  **1:45 pm**
  - **Engineering Immunogenically Dying Tumor Cells for Whole-cell Cancer Vaccination**
  - Yuchen Fan and James Moon
  - University of Michigan, Ann Arbor, MI

- **2:00 pm**
  - **Computational Model Predicts the Optimal Chimeric Antigen Receptor (CAR) Signaling Domain Structure for Dual Antigen Targeting**
  - Jennifer A. Rohrs, Dongqing Zheng, Nicholas A. Graham, Pin Wang, and Stacey D. Finley
  - University of Southern California, Los Angeles, CA

- **2:15 pm**
  - **DNA Netosis Engineered to Ensnare and Kill Disseminated Tumor Cells**
  - Haleigh Eppler and Christopher Jewell
  - Biological Sciences, University of Maryland - College Park, College Park, MD, 2Wayne State University, Detroit, MI, 3Shanghai Jiao Tong University, Shanghai, China

- **2:30 pm**
  - **Cytosolic Phospholipase A2 Facilitates Soluble Oligomeric Amyloid-β Uptake in Microglia**
  - Tao Teng, Devin Ridgley, Li Dong, Orly Lazarov, Grace Sun, and Ahmet Yanik
  - University of California Davis, Davis, CA

**OP-Sat-2-10 Room 222C**

**Track: Tissue Engineering**

**Musculoskeletal Tissue Engineering**

- Chairs: Warren Grunder, Mark Van Dyke
- **1:30 pm**
  - **Effects of Dexamethasone Priming on Osteogenesis of Mesenchymal Stem Cells in PEG-based Microfiber Hydrogels**
  - Jianfeng Li, Xinning Tong, and Fan Yang
  - Stanford University, Stanford, CA

  **1:45 pm**
  - **Immu-no-regulatory Roles of Cyclic Loading that Promotes Skeletal Muscle Regeneration**
  - Erkin Seker
  - University of California, Davis, CA

- **2:00 pm**
  - **Development of a Composite Scaffold to Provide Electrical, Mechanical, and Topographical Cues for Myoblast Maturation**
  - Daniel Brown and Joseph Freeman
  - Rutgers University, Piscataway, NJ

  **2:15 pm**
  - **Long-term Survival, Functionality, and Proteolytic Degradation of 3D Printed Neuromuscular Machines**
  - Caroline Cuevas, Meghan Ferris-Fairbanks, Manu Platt, and
  - Rashid Bashir
  - Houston Methodist Research Institute, Houston, TX

- **2:30 pm**
  - **Towards Combining Cell Printing and CRISPR Epigenome Editing for Engineered IVD and Musculoskeletal Tissues**
  - David Edie, Nikoli Davidoff, Leann Lam, Alejandro Bitche, David Au, and
  - Robby Bowles
  - University of Utah, Salt Lake City, UT

  **2:45 pm**
  - **Repair and Regeneration of Chondral Defects: An In Vitro Study Demonstrating Feasibility and Mechanism**
  - Neeraj Sahai, Gaurav Budhiraja, and Anuradha Subramanian
  - University of Nebraska-Lincoln, Lincoln, NE

**OP-Sat-2-11 Room 222A**

**Track: Applications of Nanomaterials and Nanotechnology**

- Chairs: Amber Dizdar, Neha Kami
- **1:30 pm**
  - **Development of Anti-HER2 Indocyanine Green-Encapsulated PEG-Coated PGA Nanoparticles for Targeted Phototherapy of Breast Cancer Cells**
  - Yu-Hsiang Lee and Fuyuan Lin
  - National Central University, Taoyuan, Taiwan

  **1:45 pm**
  - **Electrically-Guided DNA Printing and Multiplexed DNA Detection with Nanoporous Gold Electrodes in a Microfluidic Device**
  - Ahmet Yanik, Atul Vashisht, Zidan Li, Pallavi Daggamati, Ling Wang, and
  - Erkin Seker
  - University of California Davis, Davis, CA

  **2:00 pm**
  - **Proteolytic Degradation of 3D Printed Tissue Engineering Materials by an Acoustofluidic Micromixer**
  - Shuai Yu, Zhen Wang, Tingfeng Yao, and Baohong Yuan
  - University of Texas at Arlington, Arlington, TX

  **2:15 pm**
  - **Size and Shape-controllable Synthesis of Nanomaterials by an Acoustic Microfluidic Micromixer**
  - Po-Hsun Huang, Shuaiguo Zhao, Mengxi Wu, Nitesh Nama, and
  - Ahmet Yanik
  - Duke University, Durham, NC

  **2:30 pm**
  - **Field-Detection of Magnetic Iron Oxide Nanoparticle-Induced Heating**
  - Sheng Tong, Lian Hong, and Gang Bao
  - Rice University, Houston, TX

  **2:45 pm**
  - **Quantification of Circulating M. tuberculosi s Antigen Peptides Allows Rapid Diagnosis and Treatment Monitoring**
  - Chang Liu, Jia Pan, Christopher Lyon, and
  - Yu He
  - Wayne State University, Detroit, MI

**OP-Sat-2-12 Room 228B**

**Track: Track: Sensors and Other Devices**

- Chairs: Daniel Heller, Joshua Doloff
- **1:30 pm**
  - **Electrophysiology of Platinum and Carbon Electrodes in Stimulating Peripheral Nerve and EMG Recording**
  - Kexin Zhang, Chaitanya Chen, Yong Hai, Biao Chen, Jia Hu, Yang Zhou, John Cavanaugh, and
  - Mark Ming Cheng Cheng
  - China Capital Medical University, Beijing, China, People’s Republic of

  **1:45 pm**
  - **Anti-Biofouling Implantable Magnetic Micro-actuators with Integrated Piezoresistive Sensor**
  - Dodge W. Louis, Andrey Turlikov, and
  - Robert D. Anderson
  - Purdue University, West Lafayette, IN

  **2:00 pm**
  - **Multiphysics Modeling of Implantation and Aqueous Flow through the CyPass Micro-Stent**
  - Paul Meissel
  - Alcon Research, Ltd., Fort Worth, TX

**Saturday, October 14 | 1:30 pm—3:00 pm | Platform Session 2**

**OP-Sat-2-13 Room 228A**

**Track: Device Technologies and Biomedical Robotics**

- Chairs: David Hoefer, Joshua Doloff
- **1:30 pm**
  - **Thick-Shelled Indium Phosphide Quantum Dots: Cadmium-Free Imaging in the Visible and Near Infrared**
  - Allison Demma, Rayahye Tahvanian, Alexander Saxboe,
  - Margaret Chen, and
  - Thuy Nguyen
  - Boston University, Boston, MA

  **2:00 pm**
  - **Near-Infrared Chemiluminescent Nanoparticles for In Vivo Optical Imaging**
  - Veronkaja Peremel, Rupinder Kaur, and
  - Jung-Jae Lee
  - University of Colorado Denver | Anschutz Medical Campus, Denver, CO

  **2:15 pm**
  - **Temperature-switchable Near-infrared Fluorescence Nano-capsules**
  - Shuai Yu, Zhen Wang, Tingfeng Yao, and Baohong Yuan
  - The University of Texas at Arlington, Arlington, TX

  **2:30 pm**
  - **Nanstructure Introduces Artifacts in Quantitative Immunofluorescence by Influencing Fluorophore Intensity**
  - Christopher Chapman, Xiangzhao Zhi, Hao Chen, Pamela Lai,
  - Atmet Yanik, and
  - Hei Sohn
  - University of California, Davis, Davis, CA, University of California, Santa Cruz, Santa Cruz, CA

**Platform Session 2—Saturday—2:130 pm—3:00 pm**
2:15 pm
**In Vivo Implantable Optical Nanosensor for MicroRNA**
Daniel Haller1, Jackson Harvey2, Prakrit Jena, Ryan Williams, Thomas Galasso1, Guil Zerze3, and Jeff Yeh1
1Memorial Sloan-Kettering Cancer Center, New York, NY; 2Ward Cornell Medical College, New York, NY; 3SUNY Binghamton, Binghamton, NY

2:45 pm
**A Microfluidic Device for Predicting a Cancer Patient’s Risk of Metastasis and Response to Chemotherapy**
Christopher Yankawask, Panagiotis Mirostinos, Colin Paul, Kayla Thompson, Kristen Martinez, Andreas Cheung, Michaela Vukicic, Stuart Martin, and Konstantine Konstantopoulos
The Johns Hopkins University, Baltimore, MD; University of Maryland School of Medicine, Baltimore, MD

**OP-Sat-2-15**
**Room 227C**
**Track: Biomedical Engineering Education (BME)**
**Motivation and Added Value**
Chairs: Veronique Peller1, Ruth Ochoa2

1:30 pm
**Non-cognitive Factors Associated with Freshmen Undergraduate Bioengineering Majors**
Ruth Ochoa1, James Bracey2, and Yeh-eh Hsu1
Temple University, Philadelphia, PA

1:45 pm
**What Freshman Biomedical Engineering Students Think They’re Going To Do After Graduation**
Emma Frow1 and Michael Caplan1
Arizona State University, Tempe, AZ

2:00 pm
**Teaching Communications Skills to Undergraduate and Graduate Students of Biomedical Engineering at the University of Utah: A Genre Acquisition and Apprenticeship Approach**
Rob MacLeod1 and Heather Palmer1
University of Utah, Salt Lake City, UT

2:15 pm
**Engaging Biomedical Engineering Students in Health Disparities Research and Impact: A Pilot Study at the City College of New York (CCNY)**
Maribel Vasquez1, Chris Morse1, Joseph Sartor2, and Kann Huband1
City College of New York (CCNY), New York, NY

2:30 pm
**Impact of Two-Stage Quizzes on Student Learning and Perceptions in a Lower Division BME Course**
Jennifer Cho1
University of California Davis, Davis, CA

2:45 pm
**The Value-oriented Health Economic Environment: What Every Innovator Should Know**
†Monique Peller1, Cynthia York1, Paul York2, and Jan Pietsch2
1Stanford University, Stanford, CA; 2Wing Tech Inc., Menlo Park, CA

*BME Track sponsored by:

Saturday, October 14 | 1:30 pm–3:00 pm | Platform Session 2
### Platform Session 1

**Saturday, October 14 | 2:00 pm – 3:00 pm | Platform Session 2**

<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
<th>Speaker(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2:00 pm</td>
<td>Predictive Modeling of Sepsis in Adult ICU Patients</td>
<td>Philip Schroeder, Roman Wang, Yasavini Pulgundula, Catherine Sun, Mawalalo Amokle, Christopher Moore, and Laura Barnes</td>
</tr>
<tr>
<td>2:15 pm</td>
<td>The Use of Allogeneic Block Bone Grafts as an Effective Bone Substitute During Implant Insertion</td>
<td>Ank Deb Kulkarni, Joshua Cohen, Kayla Scott, Kaan Sahingur, Barbara D. Boykin, and Zvi Schwartz</td>
</tr>
<tr>
<td>2:24 pm</td>
<td>Porous Silicon Nanoparticle Fabrication Optimization Toward sRNA Loading and Delivery</td>
<td>Elisabeth Curotto, Jason Kelly, Joshua Fair, Meredith Jackson, Sharon Weiss, and Craig Duvall</td>
</tr>
<tr>
<td>2:33 pm</td>
<td>The Composition of the Biomass Objective Function in Genome-Scale Metabolic Models Impacts Silico Predictions</td>
<td>Patrick Gelbach, Anna Blazei, and Jason Pepin</td>
</tr>
<tr>
<td>2:42 pm</td>
<td>Analysis of C9ORF72 in ALS via Targeted Transcriptional Regulation</td>
<td>Amanda Urke, Antonia Dominguez, and Lei S. Qi</td>
</tr>
</tbody>
</table>

### Platform Session 3

**Saturday, October 14 | 3:15 pm – 4:45 pm | Platform Session 3**

<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
<th>Speaker(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3:15 pm</td>
<td>Novel PEG-based Hydrogel via Thiol-Epoxy Chemistry for Controlling Stem Cell Fate</td>
<td>Cong-Truc Huynh, Fangjie Liu, Catherine A. Coughlin, and EllenAlsberg</td>
</tr>
<tr>
<td>3:30 pm</td>
<td>Chromonic Liquid Crystal Hydrogels with Patternable, High Strain Actuation for Biomedical Applications</td>
<td>Jennifer Bostwick, Robin Kulshrestha, and Taylor Weaver</td>
</tr>
<tr>
<td>3:45 pm</td>
<td>Aligned Hydrogel Tubes and Bridges Guide Axon Elongation and Myelination Following Spinal Cord Injury</td>
<td>Courtney Dumont, Mitchell Carlson, and Lonnie Sheh</td>
</tr>
<tr>
<td>4:00 pm</td>
<td>Hydrogel Degradation Mechanism Impacts Adventitial Fibroblast Behavior</td>
<td>Rebecca Scott, Karyn Robison, Robert Akine, and Kristi Kirk</td>
</tr>
<tr>
<td>4:15 pm</td>
<td>An In Vitro Model for Injectable Silk-HA Hydrogels to Prevent Preterm Birth</td>
<td>Nicole R. Raia, Stephanie L. Bakaysa, Chiara E. Ghezzi, Michael D. House, and David L. Kaplan</td>
</tr>
<tr>
<td>4:30 pm</td>
<td>Multifactorial Analysis of Alginate-Mediated Maintenance of Preconditioned MSC Spheroids</td>
<td>S. Nick Hui and J. Kent Lushchak</td>
</tr>
</tbody>
</table>

*Biomaterials Track sponsored by: [Biomaterials Track sponsored by: Image]"
Saturday, October 14 | 3:15 pm–4:45 pm | Platform Session 3

**OP-Sat-3-4** Room 229B

**Tracks:** Cardiovascular Engineering, biomechanics

**Mechanobiology of the Cardiovascular System**

Chair: Kyota Nguyen, Chekay Simmons

**3:15 pm**

Mitochondrial Function is Co-regulated by Matrix Elasticity and Tissue Alignment in Engineered Cardiac Tissues

Dave M. Lyra-Leite,1 Allen M. Andrew,1 Andrew P. Petersen,1 Nathan Che,1 Nathalia R. Aragoncillo2, Jason Lee,3 Roberta A. Gottlieb2, and Megan L. McCain1,3

1Laboratory for Living Systems Engineering, Department of Biomedical Engineering, Brinkley School of Engineering, University of Southern California, Los Angeles, CA, 2Heart Institute and Barbra Streisand Women’s Heart Center, Cedars-Sinai Medical Center, Los Angeles, CA, 3Department of Stem Cell Biology and Regenerative Medicine, Keck School of Medicine of USC, University of Southern California, Los Angeles, CA

**3:30 pm**

Vinculin-mediated Increase in Cardiac Function Confers Systemic Metabolic Efficiency and Extends Healthspan and Lifespan

Ayla Session1, Peter Mon2, and Adam Englar1

1University of California, San Diego, La Jolla, CA

**3:45 pm**

Computational Modeling of Inferior Vena Cava Filters: Identifying Fluid-Structure Interactions that Lead to Filter Perforation

Robert Herbert1, Josh Dziewulski1, and Sameh Ghadiali1,3

1The Ohio State University, Columbus, OH, 2St Vincent Hospital and Health Services, Indianapolis, IN, 3Ohio State University Wexner Medical Center, Columbus, OH

**4:00 pm**

A Mathematical Model for NPO Production by Glial and Xanthine Oxidases During Hypoxia

Yuen Lau1, Donald Buck1, Kenneth Barbier1, and Bing Jiang1

1Drexel University, Philadelphia, PA

**4:15 pm**

Giving it a Whirl: Spiral Flow Modulation of Mechanical Circulatory Support Devices

Pablo Huang Zhang1,2, Peter Davies3, and J. Yasha Kresh1,2,3

1University of California, San Diego, La Jolla, CA, 2JAH VA Hospital, Tampa, FL, 3Ohio State University Wexner Medical Center, Columbus, OH

**4:30 pm**

Patient Specific Assessment of Critical Embolization Rates in the Hybrid Norwood Procedure

Ray Prather1, John Seligson1, Marcus Núñez1, Alan Kazakab, Eduardo Divi1, and William DeCampli3

1University of Central Florida, Orlando, FL, 2Embry Riddle Aeronautical University, Daytona Beach, FL, 3Ohio State University, Columbus, OH

**4:45 pm**

Anisotropic Hysteresis of Vascular Smooth Muscle Cells Measured by Cellular Micro-Biaxial Stretching

Zaw Win1, Justin Buske1, and Patrick Allford1

1University of Minnesota, Minneapolis, MN

**OP-Sat-3-5** Room 221A

**Tracks:** Cardiovascular Engineering, Bioinformatics, Computational and Systems Biology

**Computational Modeling in Cardiovascular Systems**

Chair: Andrew Siefer, Saami Yazdani

**3:15 pm**

On the use of Brachial Pressure as an Estimator of Hyperemic Aortic Pressure in Computing Fractional Flow Reserve

Elizabeth Thompson1, Arlen Lealau1a, Habib Samady1, and Dan Goldstein3

1Emory University School of Medicine, Atlanta, GA, 2Georgia Institute of Technology and Emory University, Atlanta, GA

**3:30 pm**

Computational Modeling of Blood Flow in Microvascular Networks

Peter Balogh1 and Irfan Baghi2

1Rutgers University, Piscataway, NJ

**3:45 pm**

Computational Modeling of Inferior Vena Cava Filters: Identifying Fluid-Structure Interactions that Lead to Filter Perforation

Robert Herbert1, Josh Dziewulski1, and Sameh Ghadiali1,3

1The Ohio State University, Columbus, OH, 2St Vincent Hospital and Health Services, Indianapolis, IN, 3Ohio State University Wexner Medical Center, Columbus, OH

**4:00 pm**

The Use of Magnetic Microwires in Promoting Osteosarcoma Cell Death In Vivo

Jay Campbell1,2, Joan Martinez de Asensi1, Sara Larrabe-Sancha3, Iñigo Arranz-Bacarreza4, Oihane Mitxelena-Iribarren2,3, Valentina Zhukova4, Araceli Zhukova5, Sergio Arenas1, and Matte Mijuk5

1Regis University, Denver, CO, 2CEIT and Tecnun (University of Navarra), Donostia-San Sebastian, Spain, 3UPV/EHU, Donostia-San Sebastian, Spain, 4IKERBASQUE, Basque Foundation for Science, Bilbao, Spain

**4:15 pm**

Anti-fusion Targeted Nanomicellar Theranostics: Novel Antiviral Strategies for Respiratory Syncytial Virus Infection-induced Lung Diseases

Shyem Mohapatra1 and Subhra Mohapatra1

1University of South Florida, Tampa, FL, 2UVA VA Hospital, Tampa, FL, 3Univ of South Florida, Tampa, FL

**4:30 pm**

Crystal Structure and Dimension: Towards the Production of a Catalytic ROS Producing Nanoparticle

Dawson Frost1,2,3, Nathan Reed1, Rebecca Baily1, Rebecca Gibson1, Ru Tang2, and Samuel Achilefu1

1Washington University in St. Louis, St. Louis, MO, 2Duke University, Durham, NC, 3Duke University, Durham, NC

**OP-Sat-3-6** Room 221B

**Tracks:** Nano and Micro Technologies, Drug Delivery & Intelligent Systems

**Nano to Micro Devices in Delivery III**

Chair: Andrew Tosuckar, Smilka Rao

**3:15 pm**

Modulating Cerebral Hemodynamics to Facilitate Nanoparticle Drug Delivery to the Brain

David Medina1, Rick Caten2, Eugene Chung3, and Rachael Sirimanna2

1Barrow Neurological Institute, Phoenix, AZ, 2Arizona State University, Tempe, AZ

**3:30 pm**

Monitored Nanoparticle Stability and Mobility in Whole Blood and Tissues In Situ

Ana Boshorouei1, Mytrehg Unu6, Andera Chiu1, Sayali Belare1, Lisa Rogers1, Chris Pampou1, Damien Siemens1, and Carlos Rinaldi1

1University of Florida, Gainesville, FL

**3:45 pm**

Femtomolar IL-1 Cytokine Detection Using A Microfluidic FePt Nanoparticle-Based ELISA

Rahool Collared1, Matthias Wolf1, Jung Seok Lee1, Luye Mu1, Jean-Luc1, Tarak Fall1, and Mark Fall1

1York University, New Haven, CT

**4:00 pm**

Development of an Ezrin Tension Sensor to Measure Forces Between the Cytoskeleton and Plasma Membrane

Matthew Bergey1, Andrew LaCroix1, and Brenton Hoffman1

1Duke University, Durham, NC

**4:30 pm**

Self-Assembled FN III 12-14 Into Microaggregates Drive Cells To EMT

Hilmi Humed1 and Christopher Lemmon1

1Virginia Commonwealth University, Richmond, VA

**4:45 pm**

Visualizing and Quantifying Fibroblast Collagen Production in an In Vitro Model of Wound Healing and Fibrosis

Marian El-Mofty1 and Rosana Londer1

1University of Iowa, Iowa City, IA

**OP-Sat-3-7** Room 225B

**Track:** Biomedical Imaging and Optics

**Biomedical Imaging and Optics**

Chair: Paolo Provenzano, Ramon PassX

**3:15 pm**

Adaptive Optics for Autofocusing Eyeglasses

Nasrul Haseen1, Mohit Khurana1, Farha Khair2, Ashwaryawarner Banerjee1, Trishb Ghosh1, Haneep Kim1, and Carlos Mastrangelo1

1University of St. Louis, Salt Lake City, UT, 2SharEyez LLC, Salt Lake City, UT

**BMES 2017 | Phoenix**

**Phoenix | BMES 2017**

**PO-Sat-3-8** Room 221B

**Track:** Cellular and Molecular Bioengineering

**Cellular and Molecular Bioengineering**

Chair: Greg Mudella, Krishanu Saha

**3:15 pm**

Proximity-based Sortase-mediated Ligation

Heya Wang1, Burcin Altan1, Kato Nao2, and Andrew Tosukar1

1University of Pennsylvania, Philadelphia, PA

**3:30 pm**

In-silico Design Of CRISPR/Cas9 Guide RNA For Personalized Medicine

Yidan Pan1, CiRan Lee1, and Geng Bao2

1Rice University, Houston, TX

**3:45 pm**

Computational Modeling in Nano to Micro Devices in Delivery III

Jay Campbell1,2, Joan Martinez de Asensi1, Sara Larrabe-Sancha3, Iñigo Arranz-Bacarreza4, Oihane Mitxelena-Iribarren2,3, Valentina Zhukova4, Araceli Zhukova5, Sergio Arenas1, and Matte Mijuk5

1Regis University, Denver, CO, 2CEIT and Tecnun (University of Navarra), Donostia-San Sebastian, Spain, 3UPV/EHU, Donostia-San Sebastian, Spain, 4IKERBASQUE, Basque Foundation for Science, Bilbao, Spain
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<thead>
<tr>
<th>Time</th>
<th>Session Title</th>
<th>Location</th>
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<tbody>
<tr>
<td>3:30 pm</td>
<td>Real-Time Label-Free Imaging of Dynamic Metabolic Processes During Apoptosis in Live Cells</td>
<td>University of Arizona, Tucson, AZ</td>
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<td>3:45 pm</td>
<td>Improved Performance in Fiber Bundle Imaging Systems Via Dithering</td>
<td>University of Louisville, KY</td>
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<td>4:00 pm</td>
<td>Photonic Inactivation of Virus Particles by Femtosecond Lasers</td>
<td>University of Arizona, Tucson, AZ</td>
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<td>4:15 pm</td>
<td>Noncontact 3-dimensional Speckle Contrast Diffuse Correlation Tomography of Tissue Flow Distribution</td>
<td>University of Kentucky, Lexington, KY</td>
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<td>4:30 pm</td>
<td>Point-of-System for Monitoring Cellular Adhesion in Sickle Cell Disease</td>
<td>Case Western Reserve University, Cleveland, OH</td>
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<td>4:45 pm</td>
<td>Accurate Segregation of Pressure Ulcer Images</td>
<td>Case Western Reserve University, Cleveland, OH</td>
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<td>3:30 pm</td>
<td>Track: Device Technologies and Biomedical Robotics</td>
<td>Room 228A</td>
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<td>3:35 pm</td>
<td>Affordable Health and Frugal Innovation</td>
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<td>3:45 pm</td>
<td>How Specific Sequence Features of FG Nups Affect Nuclear-cytosolic Transport</td>
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<td>3:50 pm</td>
<td>Keratinocyte ERK Signaling is Modulated by Growth Factor Presentation Scheme and Cellular Tight Junctions</td>
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<td>4:00 pm</td>
<td>Computational Model Predicts the Dynamics of Thrombospondin-1 Mediated Apoptosis Signaling</td>
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<td>4:45 pm</td>
<td>Track:慈Engenralig and Regeneration</td>
<td>Room 226B</td>
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<td>3:35 pm</td>
<td>Improving Functional Gains in a Skilled Reaching Task Following Brain Injury Through Combinatorial Neural Stem Cell and Motor Rehabilitation Therapy</td>
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<td>3:50 pm</td>
<td>Endogenous Neural Stem Cell Activation After Traumatic Brain Injury</td>
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<td>4:05 pm</td>
<td>Feasibility of Nanoparticle Delivery Correlates With Blood Brain Barrier Permeability After Diffuse Brain Injury</td>
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<td>Room 227C</td>
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<td>3:35 pm</td>
<td>The Influences of Mitochondrial Depolarization on Mitochondrial Network Structures</td>
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<td>3-Dimensional Fluid-Structure Interaction Computational Model of Heart Valves For Bioreactor Optimization</td>
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<td>Antibacterial Effects of Copper-PDMS Membranes For Artificial Lungs</td>
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<td>3:45 pm</td>
<td>Similarity in Viral and Host Promoters Cocultures Viral Reactivation with Host Cell Migration</td>
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**PLATFORM SESSIONS—SATURDAY—3—3:15 PM—4:45 PM**
Saturday, October 14 | 3:15 pm–4:45 pm | Platform Session 3

3:51 pm
Modeling Glioblastoma Invasion With Microfluidics
Elijah Karvelis, Mai Ngo, Aidan Gilchrist, Roger Kamm, and Brendan Harley
University of Illinois at Urbana Champaign, Urbana, IL, *Massachusetts Institute of Technology, Cambridge, MA

4:00 pm
Anti-inflammatory Potential and Dose Dependence of Select Cytokines on Macrophage Activation Profiles
Nicolas Castro, Hongyu Chen, and Mariah Hahn
*Georgia Institute of Technology, Atlanta, GA, **Cornell University, Ithaca, NY

4:09 pm
Tunable Release of Metabolic Modulators To Restrain Autoimmune Reactions
Jessica Yue, Joshua Gammon, and Christopher Jewell
1University of Maryland, College Park, MD, 2University of Maryland Medical School, Baltimore, MD, 3Marlene and Stewart Greenebaum Cancer Center, Baltimore, MD, 4United States Veterans Administration, Washington D.C., MD

4:18 pm
Smartphone-Based Microscope For Pathogen Detection
Meghan Henderson, Katherine Clayton, Ryan Preston, Dong Hoon Lee, Steven Wereley, Tamara Kinzer-Ursem, and Jacqueline Linnmes
*Purdue University, West Lafayette, IN

4:27 pm
Spatial Organization of Peptides by 3D Printing with Peptide-Polymer Conjugates
Kelly Seims, Katherine Houdensiel, Peter Schwarzenberg, Hafiz Busari, Divya Patel, Arianna Pineiro, Hannah Dailey, and Lesley Chow
*Lehigh University, Bethlehem, PA

4:36 pm
High-Throughput Single-Cell Analysis of MSC Mechanosensing
John F. Durai, Sebastián L. Vega, and Jason A. Burdick
1University of Virginia, Charlottesville, VA, 2University of Pennsylvania, Philadelphia, PA
SAT-9 Inclusion of Fold Change Genes into a Computational Model to Identify Novel Regulators of Cardiomyocyte Hypertrophy
Kurtney H. Bridgey, Brian Chou, and Jeffrey J. Saezermann
University of Virginia, Charlottesville, VA

SAT-10 Non-motor Symptoms as a Marker of Parkinson’s Disease Progression: An Exploratory Analysis
Kimberly Huyett, Ying-Hua Chou, Mark Sundrum, Nan-Iuan Chen, and Virginia Subian
University of Arizona, Tucson, AZ

SAT-11 Agent Based Modeling of Salmonella Infection
Miguel Anaya, Shayan Pervez-Cotlier, and Lee Takman
1Swarovski Institute of Technology, Noblesville, IN, 2University of Virginia, Charlottesville, VA

SAT-12 Refining Causal Networks Associated with Immune Cell Interactions in Cancer using Network Inference Algorithms and Expanded Metagenic Constructs
Parvaz Ghaspa and David Kiska
West Virginia University, Morgantown, WV

SAT-13 Bottom Up Approach for Examining Network Connectivity Through Measures of Dynamics
Ryuki Kondoi, Vincent Tirvuludai, Robert Butera, and Helen Mayberg
Georgia Institute of Technology, Atlanta, GA, Emory University, Atlanta, GA

SAT-14 FLOWMAP: A Tool to Visualize Single-Cell Datasets with Force-Directed Graph Layout
Ryuki Kondo
University of Virginia, Charlottesville, VA

SAT-15 MaGiC: Predictive Infrastructure Leveraging Chromatin Signature to Infer Stochastic Monolocalic Expression
Saihth Sairakh, Henry Wang, Sebastian Vigna, Sufyan Vajjala, and Alexander Grinblat
University of Pennsylvania, Philadelphia, PA

SAT-16 Identification of Adipose Gene Networks Using Naturally Occurring Genetic Variation in Male and Female Mice
Shayna Holness and Mite Crolvek
Baylor University, Lawrenceville, NJ, University of Virginia, Charlottesville, VA

SAT-17 Coupling of Agent Based and Network Models of Cardiac Fibrosis
Thomas Athey, Jia Jie Lee, Jeff Saezermann, and Jeffrey Holmes
University of Virginia, Charlottesville, VA, Johns Hopkins University, Baltimore, MD

SAT-18 Design of Intrathecal Visualizations of Mastectomy Specimens for Breast Reconstruction Surgery
Tien Comolkolpet and Seth Weinberg
Virginia Commonwealth University, Richmond, VA

SAT-19 Membrane Capacitive Memory Suppresses Alternans, Promotes Spontaneous Activity, and Alters Conduction in a Fractional-Order Minimal Cardiomyocyte Model
Tien Comolkolpet and Seth Weinberg
Virginia Commonwealth University, Richmond, VA

SAT-20 Heart Rate Variability Alters Cardiac Repolarization and Electromechanical Dynamics
Vishvi Phadke and Seth Weinberg
Virginia Commonwealth University, Richmond, VA

SAT-21 Exploration of Variables for Use in a Retrieval Method for a Case Based Reasoning System for Predicting Appearance After Breast Reconstruction
Yahir Garay, Krista M. Nicklaus, Chao Zheng, Elena M. Raff, and Ben H. Haines
University of Texas at El Paso, El Paso, TX, The University of Texas at Austin, TX, The University of Texas MD Anderson Cancer Center, Houston, TX

SAT-22 Multi-Scale Hydrogel Printing Using Open-Source 3D Printer
Alex Filip, Lucas Abresch, Stephen Sawyer, and Pranav Soman
Syracuse University, Syracuse, NY

SAT-23 The Bending of TiN and Au Wiring on Soft Polymer Substrates
Allie Kwan, Allie Wood, and Walter Voh
University of Texas at Dallas, Richardson, TX

SAT-24 Exploration of Defect Site Growth in Thin-Film Encapsulation Layers
Azevaz Naeem Khanam, Alexander Joshi, and Stuart Cooper
University of Texas at Dallas, Richardson, TX

SAT-25 Design of Undergraduate Research, Design & Leadership, Biomaterials
Kimberly Huynh, Ying-Hui Chou, Mark Sundrum, Nan-Iuan Chen, and Virginia Subian
University of Arizona, Tucson, AZ

SAT-26 Comparison of Multi-arm PEG-based Hydrogels for Tendon and Ligament Repair
Amanda Kautzer, Breanne Brand, Carly Joseph, Ariana Tys, and Rupali Raker
Michigan Technological University, Houghton, MI

SAT-27 Synthesis and Characterization of Biogenic Selenium Nanoparticles with Antibacterial properties
David Cruz, Amit K. Roy, and Thomas J Webster
Northeastern University, Boston, MA

SAT-28 Engineering and Cytotoxicity Study of 3D Printed TangoPlus and VeroClear as Potential Biomaterials
Angela P. Adrien, Tyl Nicholson, Zachary Elsworth, David Britt, Craig Day, and Yu Huang
University of Arizona, Tucson, AZ, University of Texas at Austin, Austin, TX

SAT-29 Imidazole-Modification Enhances Nanoparticle Transport Through Cystic Fibrosis (CF) like Mucus and Promotes Uptake into a Human CF Cell Line
Angela Jimenez, Jocelyn Majaj, Blake Lash, and Krishnendu Roy
University of Florida, Gainesville, FL, Georgia Institute of Technology and Emory University, Atlanta, GA, Georgia Institute of Technology, Atlanta, GA

SAT-30 Design of a Light-Mediated, Reversible Sol-Gel Transition PEG Hydrogel Using LOV2
Anna Rube, Joshua Hannon, and Jennifer Wolf
Duke University, Durham, NC

SAT-31 Pathophysiology Model using Micro- Continental Optical Printing
Anna Veesay, Kathleen Miller, Natalie Lawrence, Justin Liu, and Shaoshen Chen
Stanford University, Stanford, CA, and San Diego, CA

SAT-32 Novel Materials for Additive Manufacturing
Benjamin Young, Katherine Jernigan, Lee Cagle, and Jonathan Logsdon
Clayton, Anderson, SC, Clemson, Clemson, SC, Clemson, Ellington, SC

SAT-33 Design of Undergraduate Research, Design & Leadership, Biomaterials
Kimberly Huynh, Ying-Hui Chou, Mark Sundrum, Nan-Iuan Chen, and Virginia Subian
University of Arizona, Tucson, AZ

SAT-34 Design of Intrathecal Visualizations of Mastectomy Specimens for Breast Reconstruction Surgery
Tien Comolkolpet and Seth Weinberg
Virginia Commonwealth University, Richmond, VA

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SAT-36 Heart Rate Variability Alters Cardiac Repolarization and Electromechanical Dynamics
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SAT-37 Exploration of Variables for Use in a Retrieval Method for a Case Based Reasoning System for Predicting Appearance After Breast Reconstruction
Yahir Garay, Krista M. Nicklaus, Chao Zheng, Elena M. Raff, and Ben H. Haines
University of Texas at El Paso, El Paso, TX, The University of Texas at Austin, TX, The University of Texas MD Anderson Cancer Center, Houston, TX

SAT-38 Multi-Scale Hydrogel Printing Using Open-Source 3D Printer
Alex Filip, Lucas Abresch, Stephen Sawyer, and Pranav Soman
Syracuse University, Syracuse, NY

SAT-39 The Bending of TiN and Au Wiring on Soft Polymer Substrates
Allie Kwan, Allie Wood, and Walter Voh
University of Texas at Dallas, Richardson, TX

SAT-40 Exploration of Defect Site Growth in Thin-Film Encapsulation Layers
Azevaz Naeem Khanam, Alexander Joshi, and Stuart Cooper
University of Texas at Dallas, Richardson, TX
SAT-33 Nanoceria-5OD Conjugate’s Antioxidant Thermal Stability
Bradley Skalator1, Benjamin Syngroul, Nicholas Seiter, Dmitry Giff1, and Vladimir Paulovich
Clemson University, Clemson, SC

SAT-34 Effects of Aging on Liver Extracellular Matrix Structural Proteins
Brandon Burger1, Andrea Hartmann2, Elizabeth Stahl2, and Bryan Brown
University of Pittsburgh, Pittsburgh, PA, University of Pittsburgh, Pittsburgh, PA

SAT-35 Fabrication of a Brain Endothelium in a Perfused Hydrogel Scaffold
Calle Weber1, Jason Wang1, Emma Hoffmann1, Allison Bosworth1, Shannon Faley1, Ethan Lipps2, and Leon Beller1
Vanderbilt University, Nashville, TN

SAT-36 Evaluating the Feasibility of 3D Printing a PE-GDA Hydrogel for Skeletal Muscle Tissue Engineering
Carolina Leynere1, Robert Warrner1, Daniel Browe1, and Joseph Freeman1
1The University of Texas Rio Grande Valley, Brownsville, TX, 2Rutgers, The State University of New Jersey, Piscataway, NJ

SAT-37 Cells on Gels: Biomimetic Micron-Scale Polycrylamide Gel Substrates for Studies of GBM Cell Adhesion and Migration
Caroline Miller1, Alyse Krausz1, Natalia Huguet-Castro1, Daniel Callish1, and Derek Hansford1
1The Ohio State University, Columbus, OH, 2University of Michigan, Ann Arbor, MI

SAT-38 Lynymph Node Trafficking and Dendritic Cell Activation of Supramolecular Peptides
Cassandra Ingrum1, Lucas Shores1, and Joel Collier1
Duke University, Durham, NC

SAT-39 Stability of Weak Adhesion in MBA-MD231 Cells as an Indication Of Metastatic Capacity
Chandra Anu1, Fransjei Ben1, and Adam Engler1
University of California, San Diego, La Jolla, CA, Sanford Consortium, La Jolla, CA

SAT-40 Characterization of an Extracellular Matrix Hydrogel and its Effects on MMP Activity
Charles Webb1, Timothy Kearan1, Christina-Maria Horjoi1, and Molly Sewano
Carnegie Mellon University, Pittsburgh, PA, Imperial College London, London, United Kingdom, 2Kansinska Institute, Stockholm, Sweden

SAT-41 Myostructural Stems Distribute Unevenly On PEG-DMA Hydrogel Surfaces
Christina Lachen1, Elizabeth Hernandez1, and Derek Dorskin1
Franciscan University of Steubenville, Steubenville, OH

SAT-42 Cell Densities and The Effects on Cell-Cell Junction Forces
Christina Smith1, Sung Sik Hur1, Yi-Ting Yeh1, Yi-Shuan Li1, and Shu Chen1
Arizona State University, Scottsdale, AZ, University of California San Diego, San Diego, CA

SAT-43 Determining the Rate of Oxygen Diffusion from Oxygen Microporosities Perforated Through the Peritoneum
Cora Ceman1, Nathan Legrand1, Fahria Ashrafzhu2, Hunter Veltis1, Convor Stalge1, Mark Borden1, and Benjamin Terry1
1New Mexico Institute of Mining and Technology, Socorro, NM, 2University of Nebraska, Lincoln, NE, University of Colorado, Boulder, CO

SAT-44 3D Printing with Peptide-Polymer Conjugates to Control Scaffold Functionalization and Porosity
Divya Patel1, Katherine Hudson1, Peter Schwerzenbach2, Halie Bixler1, Kelly Seims1, Hannah Deaky1, and Lexie Choin1
Lehigh University, Towanda, PA, 2Lehigh University, Bethlehem, PA

SAT-45 Microstructural and Nanomechanical Analysis of Cat Vibrisse
Gari Elsner1 and Donna Ebenstein1
Bucknell University, Lewisburg, PA

SAT-46 Development and Validation of a Method for Microindentation of Denture Teeth
Emily Gabriel1 and Donna Ebenstein1
Bucknell University, Lewisburg, PA

SAT-47 Establishment of Guidelines for Indentation of Soft Biomaterials Using Blunt Tips
Avery Snyder1 and Donna Ebenstein1
Bucknell University, Lewisburg, PA

SAT-48 Adhesion Ligand Density Influences Dendritic Cell Activation and Maturation in RGD-Modified Alginate Hydrogels
Eliza Budina1, Brian Kwee2, Nathaniel Huebsch1, Omar Ali1, and David Mowry1
1Harvard University, Cambridge, MA, 2Wyss Institute for Biologically Inspired Engineering, Cambridge, MA

SAT-49 Determining the Morphology-Property Relationship of ZnO Nanoparticles
Gregory Jensen1, Adam Talbot1, Angela Clyde1, James Gayer1, David Grim1, and Yu Huang1
1Utah State University, Logan, UT, 2University of Miami, Coral Gables, FL

SAT-50 Mesenchymal Stems Control Unevenly On PEG-DMA Hydrogel Surfaces
Christina Lachen1, Elizabeth Hernandez1, and Derek Dorskin1
Franciscan University of Steubenville, Steubenville, OH

SAT-51 Integrating Degradable Polymers for Tunable Release of Toll-like Receptor Ligands from Microneedles
Jahnai Mussumbana1, Emily Gooskens1, and Christopher Jewell2,3,4
1Fischell Department of Bioengineering, University of Maryland College Park, College Park, MD, 2Department of Microbiology and Immunology, University of Maryland Medical School, Baltimore, MD, 3Marine and Stewart Greenbaum Cancer Center, Baltimore, MD, 4United States Department of Veteran Affairs, Baltimore, MD

SAT-52 Vacancy-Driven Gelation of Thiolated Polymer Using Defect-Rich MoS2 Nanoassemblies for Biomedical Applications
James Barlow1, Marisa Jousselin1, Jake Carraro1, and Ashleigh Caharena1
1Texas A&M University, College Station, TX

SAT-53 Biocompatibility and Functionality Assessment of a Novel Nitinol Tongue Prosthetic Device to Treat Dysphagia
James Kerr1, Yanke Chen1, and Youngjae Chun1
University of Pittsburgh, Pittsburgh, PA

SAT-54 3D Printed and Solvent-Spun PNIPAM Templates for Multiscale-Vascularized Hydrogels for Brain Modeling with iPSC-Derived Brain Multicellular Endothelial Cells
Jason Wang1, Calie Weber1, Shannon Faley1, Brian O’Grady1, Kelly Seims1, and Lexie Choin1
Vanderbilt University, Nashville, TN

SAT-55 In Vitro Characterization of Tolerogenic Responses Induced by Antigen-Polymer Conjugate Nanoparticles
Justin Ros1, Ryan Pearson1, Lain Case2, Kevin Hughes1, and Lorraine Shea1
University of Michigan, Ann Arbor, MI

SAT-56 Biomimetic Rubber: Structure, Properties, and Applications
Justine Paul1, Shelby Buffington1, and Dr. Patrick Mathur1,2
1Syracuse University, Syracuse, NY, 2Bucknell University, Lewisburg, PA

SAT-57 Poly(N-isopropylacrylamide): Collagen Hydrogels for Tunable Rate of Drug Release
Katarina DiLillo1, Victoria Smith1, and Christopher Anderson1
Lafayette College, Easton, PA

SAT-58 Importance of Podosome Formation on Macrophage-Implant Interaction
Andy Vo1, Kelly Hotchkiss1, and Rene Olives-Novarrete1
1Virginia Commonwealth University, Richmond, VA

SAT-59 Gut Microbe-derived Microparticles for Controlling the Immune System
Kenneth Albert1, Swetlana Maltseva1, Iteina Omonov2, and Jamal Leav1
1University of California Davis, Davis, CA, 2Florida Agricultural & Mechanical University, Tallahassee, FL

SAT-60 Non-enzymatic Glycation Enhances Mechanical Properties of Collagen Bioinks for 3D Printing of Tissue Enginnering
Leigh Sticker1, Nicole Diamandis1, and Lawrence Bonassar1
1The University at Buffalo (SUNY), Buffalo, NY, 2Cornell University, Ithaca, NY

SAT-61 Role of Nanoparticles on Mechanical and Thermal Properties of Thermosensitive Hydrogels
Marcus Krasil1, Andrew Chang1, and Freshman Ass1
1Santa Clara University, Santa Clara, CA

SAT-62 Nanoparticle Self-Assembly for Colloidal Gel Fabrication
Mariana Gunara1, James Cosyn1, and Young Wang1
1University of Florida, Gainesville, FL, 2The Pennsylvania State University, State College, PA

SAT-63 Tuning Silk Fibroin Scaffold Spon Size Via Varying Temperature-Controlled Lyophilization Parameters
Megan Sanders1, Kim Onn1, and Jeanine Coburn1
1University of Oklahoma, Norman, OK, 2Worcester Polytechnic Institute, Worcester, MA

SAT-64 Solid Polymer Electrolytes for Lithium-Ion Batteries in Medical Devices
Mieczyslaw Erdi1, Matthew Widstrom1, and Peter Kolinas1
1University of Maryland, College Park, MD

SAT-65 Fabrication of Hybrid Hydrogel Constructs for Biomedical Applications
Michael Zimmermann1, Sara Abaz1, John Ayrey2, and Ambrose Angle2
1Texas A&M University, College Station, TX, 2Center for Bioelectronics, Biosensors and Biochips (CBB), College Station, TX

SAT-66 Chitosan as an Oral Phosphate Binder
Michael Dill1, Sharma Smith2, and Christopher Batch1
1University of Florida, Gainesville, FL
SAT-67

Influence of Biometric Scaffolding Properties on Breast Cancer Cell Morphology and Proliferation
Minh-Chau Lu, Zi Wang, Bawon Ding, Kathryn Elliott, and Stephen F. Florijn
University of Central Florida, Orlando, FL

SAT-68

Non-impact Mediated siRNA Delivery to Sialic Acid Permits Uptake in Secretory Cells
Mollie Hansen, Jomy Varghese, Martha Oparonski, Catherine Ovitt, and Danielle Benoit
University of Rochester, Rochester, NY; Cornell University, Ithaca, NY

SAT-69

Polyelectrolyte Complex (PEC) Attachment Testing for the Prevention of Adhesion in Diverse Materials
Ande Dow, Mickey HN, Reneh Schloss, and Noshir Langarla
Rutgers University, Piscataway, NJ

SAT-70

Expansion Microscopy to Image Cell Internalization of Lanthamane UCNPs
Olivia Parker, Carina Abadie, Alexandra Bystrakova, and Adah Almutairi
Princeton University, Princeton, NJ; University of California, San Diego, La Jolla, CA

SAT-71

Evaluating the Effects of Formulation Conditions on the Thermostability of NELL-1 Using Thermal Shift Assay
Patrick Minawarai, Yulong Zhang, and Benjamin Wu
University of California, Los Angeles, CA; UCLA School of Dentistry, Los Angeles, CA

SAT-72

In Vitro Vascular Model for Atherosclerosis
Khosrau Khodabandehlou, Praveen Bhardwaj, Mitul Luhar, and Shayna Cowan
University of Virginia, Charlottesville, VA

SAT-73

Characterization of Clogging Effect due to Uncross-linked Polymers in Polydimethylsiloxane (PDMS) Microludics Devices
Przychylmi Renau
Lehigh University, Bethlehem, PA

SAT-74

Printing Solidified Biomembrane Networks
Rachel Mannes, Elia Challa, Xiaojie Wang, and Eric Freeman
University of Kentucky, Lexington, KY; University of Georgia, Athens, GA

SAT-75

Analysis of Fibroblast Traction Forces on Colloidal Thin Films
Rahul Kathariya, Daniel Chester, and Ashley Brown
North Carolina State University, Raleigh, NC

SAT-76

Aligned Nonfiber Scaffolds Fabricated Via Airbrushing
Roshonda Knight and Erica Varanese
Florida Gulf Coast University, Fort Myers, FL

SAT-77

Development of a 3D Hydrogel System that Promotes Sequestration of Cell-Cellated Extracellular Matrix
Sakna Jakamali, Claire Tomaszewski, and Ariella Shkaroves
University of Michigan, Ann Arbor, MI

SAT-78

Design and Application of an Oxygen-Sensing Construct for Monitoring Chronic Wound Recovery
Samantha Schweiger, Daniel Tollo, Lindsey Jeffries, Anthony Bruder, Christopher Fraser, and Shayna Cowan
University of Virginia, Charlottesville, VA

SAT-79

Measuring the Mechanical Properties of Biological Adhesives on Hydrophobic Surfaces
Samantha Zarani, Samantha Mascitelli, Gary Dickson, and Manuel Figueroa
The College of New Jersey, Ewing Township, NJ

SAT-80

Recapturing Fibroblastic Reticular Cell Networks in Vitro Using Collagen Scaffolds
Shane Wright, Fredy Gonzalez, and Alina Tomai
University of Miami, Coral Gables, FL; Diabetes Research Institute, Miami, FL

SAT-81

Response of Bone Marrow Mononuclear Cells to Oxidative Damage and Decellularized Cardiac Extracellular Matrix
Shree Suri, Raymond Wang, and Karen Christman
University of California San Diego, La Jolla, CA

SAT-82

Incorporation of Novel BDNF-Mimetic Small Molecule onto Peptide Amphiphile Scaffolds for Neural Regeneration
Sueun Lee, Stacey Chen, Alexandra Edelbrock, and Samuel Stupp
Hope College, Holland, MI; Northwestern University, Evanston, IL; Northwestern University, Chicago, IL

SAT-83

Micro-Fabrication of Bioengineered Muscle Tissue for High Throughput Screening
Sindhoo Amberi
North Carolina State University, Raleigh, NC

SAT-84

Characterization of Decellularized Extracellular Matrix (ECM) Hydrogel for Endothelial Cell Function
Seyoum Kim, Sydney Thai, Andrea Lusia Alfonso, and Alice Ein Jung Lee
New Jersey Institute of Technology, Newark, NJ; Livingston High School, Livingston, NJ; County College of Morris, Piscataway, NJ

SAT-85

Injectable Hydrogels from Poly(ethylene glycol) and Synthetic Silicate Nanoparticles for 3D Printing
Supoj Shankar, Charles Peak, and Akhilesh Gaharwar
University of Texas at Austin, Austin, TX; Texas A&M University, College Station, TX

SAT-86

Interactions between Biophysical Processes Involved in Cancer Cell Migration
Sydney Cornier, Daniel Ortiz, and Stephanie Faleya
Union College, Schenectady, NY; University of California San Diego, La Jolla, CA

SAT-87

Injectable Enzyme-Responsive Nano-particles for Myocardial Infarction
Tara Pikula, Graci Palicio, Karen Christman, and Nathan Giannetti
North Carolina A&T State University, Columbia, SC; University of California San Diego, San Diego, CA; Northwestern University, Chicago, IL

SAT-88

Hydroxypyridyl Mineralization by Proteins Derived from Bone and Nacre
Curtiss Hanak, Kathryn Minshew, and Barb Oakes
CUNY Queens College, Bayside, NY; Rutgers, The State University of New Jersey, Piscataway, NJ

SAT-89

Pancreatic Cancer Cell Chemoresistance On Mechanically Tailored Hydrogels
Wisam Fares, Jenny Pinnix, Andrew Rubiano, and Chelsey Simmons
University of Florida, Gainesville, FL

SAT-90

Synthesis and Characterization of Modular PEG-Peptide Bioinks
Sebastian Guidice, Alexander Singh, Elliot Dobson, Colin Price, Sebastian Guidice, and Matthew Pancer
University of Virginia, Charlottesville, VA

SAT-91

Porous All-Carbon Electrodes for In Vivo Energy Storage
Michael D’Agati and Shade Sihabran
Stony Brook University, Stony Brook, NY

SAT-92

Musculoskeletal Modeling of the Lower Limb: A Novel Approach for Locomotor Rehabilitation
Abby Williamson, Anton Sabini, Matthew Boots, and Sergey Yakovenko
University of Rochester, Rochester, NY; West Virginia University, Morgantown, WV

SAT-93

Standardization of the Jaipur Foot Manufacturing Process
Catholic University, Puebla, CO; The Ohio State University, Columbus, OH; Malaya National Institute of Technology, Jaipur, India; Santibaha Durbarly Memorial Hospital, Jaipur, India

SAT-94

Correlation between Shear Wave Elastography and Mechanical Properties of the Achilles Tendon
Alexander Singh, Elliot Dobson, Noah Flesman, Colin Price, Sebastian Guidice, and Matthew Pancer
University of Virginia, Charlottesville, VA

SAT-95

Application of the Euro NCAP Pedestrian Protocol Using an Advanced Human Body Model
Alexandra Deghard, Scott Gayzik, Bharath Koya, and Will Declere
Wichita State University, Wichita, KS; Virginia Tech-Wake Forest University, College of Engineering and Sciences, Blacksburg, VA; Wake Forest University Center for Injury Biomechanics, Winston-Salem, NC

SAT-96

Numerical Determination of Wall Shear Stress in Red Blood Cell Membranes
Alfredo Lucar, Vivek P. Jani, and Pedro Cabral
University of California, San Diego, La Jolla, CA

SAT-97

Towards Virtualized Transradial Prosthesis with Simulated Dynamics and Surface EMG Interface
Amanda Studnicka, Matthew Booker, Anton Sabini, and Sergey Yakovenko
West Virginia University, Morgantown, WV

SAT-98

Rocker or Rolling? Analysis of Leg Kinematics during the Stance Phase of Normal Walking
Amanda Studnicka and Fabrizio Serni
University of Delaware, Newark, DE
SAT-99 Mechanical Integrity of a Decellularized Porcine Lamina Cribrrosa
Amy Hill, Kelsey Sadleir1, Carolina Atildia, Dominic Mulli, Bryan Brown, and Jonathan Van de Geest1 1University of Pittsburgh, Pittsburgh, PA, 2University of Pittsburgh, Pittsburgh, PA, 3McGowan Institute for Regenerative Medicine, Pittsburgh, PA, 4Louis J. Fox Center for Vision Restoration, Pittsburgh, PA

SAT-100 Quantifying Mechanical Properties of the Extracellular Matrix Using Externally Stretched Post Array Detectors
Ariana Jay DaCarno1, Carl Meyer1, Daniel Conway1, and Christopher Wagner1 Virginia Commonwealth University, Richmond, VA

SAT-101 Measuring the Motion of Finger Joints during Natural Flexion and Extension of the Human Hand
Bridge Soderman1, Christopher Nyo, and Gregory Fischl1 Worcester Polytechnic Institute, Worcester, MA, 2Camden Mellon University, Pittsburgh, PA

SAT-102 Regional Distribution and Time-Course of Changes in Abnormal Delta Wave Activity Following a Single Season of High School Football
Caroline Heller1, Elizabeth Davenport 2, Richard Barcus3, Bridget Soderna1,2, Christopher Nycz1, and Gregory Fischer1 Massachusetts General Hospital, Boston, MA, 2Worcester Polytechnic Institute, Worcester, MA

SAT-103 Gait Analysis of Genu Recurvatum Pediatric Patient Before and After KAF0 Fitting
Caroline Mes1 and Ha Vu, MD, PhD, DPM1 1Mercer University, Macon, GA, 2Mercer University School of Medicine, Macon, GA

SAT-104 Dynamic Fluorescent Assessment of Gliohemorial Kinematics in People with Spinal Cord Injury
Christina Lee1, Yen-Sheng Johnny Lin1, and Yasir Dahiya1 Northwestern University, Evanston, IL, 2Shirley Ryan AbilityLab, Chicago, IL, 3Northwestern University, Chicago, IL

SAT-105 Analysis of Stress Induced MSC Differentiation using Native ECM Scaffolds
Sawatha Raghupathi1, Amulya Veldanda1, and Christopher Wagner1 1The College of New Jersey, Ewing, NJ

SAT-106 Computational Analysis of Strain Gradients Within 3D Hydrogel Scaffolds
Amulya Veldanda1, Sawatha Raghupathi1, and Christopher Wagner1 1The College of New Jersey, Ewing, NJ

SAT-107 Repeatability of Clinical Shear Wave Elasticography Imaging of the Achilles Tendon Assessed on a Volunteer Population
Coral Priola1, Elliot Dobson1, Alexander Singh1, Nick Gomer1, J. Sebastian Giudici1, Ahmed Alshafri1, and Matthew Palmer1 1University of Virginia, Charlottesville, VA

Colin Priola1, Noah Flaim2, Ahmed Alshafri1, Erin Sanchez1, James Funk1, and Matthew Palmer1 1University of Virginia, Charlottesville, VA

SAT-109 Quantifying Motion Variability During a Skilled Dance Sequence
Cyril Denney1, Michelle Dickerson1, Julia Cipriani1, Chryssanta Davis1, Sofia Massi1, and Delina Sheth1 1George Mason University, Fairfax, VA

SAT-110 Finite Element Analysis of Femoral Neck Strength Losses Due to Space Irradiation
Dale Johnson1, Summer Laurencin1, Eric Livingston1, Robert Hans1, Catherine Davis1, and Anthony Lau1 The College of New Jersey, Ewing, NJ, 2University of North Carolina, Chapel Hill, NC, 3Johns Hopkins University School of Medicine, Baltimore, MD

SAT-111 Winding Filament Muscle Model Improves OpenSim Force Predictions
Dan Rivera1, Zachary Lerner1, and Kiisa Nishikawa1 1Northern Arizona University, Flagstaff, AZ

SAT-112 Effects of Mechanical Perturbations on Muscle Activation During Walking
Dana Lueow1, Huawen Wang1, and Anthony van den Bogert1 1University of Hartford, West Hartford, CT, 2Cleveland State University, Cleveland, OH

SAT-113 Development of Subject-Specific Musculoskeletal Models to Predict Quadriceps Strength
Daniel Davi1, Zachary Domine1, Brett Whorley3, and Anthony Kulas1 1University of Wyoming, Laramie, WY, 2East Carolina University, Greenville, NC, 3University of Nebraska-Lincoln, Omaha, NE

SAT-114 Axial Mechanical Properties of Tropolaid Processed Pericardial Grafts: Comparison to Human Tunica Albuginea Properties
Daniel Turner1 and Vincent Wang 1Virginia Tech, Blacksburg, VA

SAT-115 Geometry Dependent Relaxation of Tissue Using Softening Neural Interface Devices for Cortical and Intrathecal Applications
David Shumate1, Joseph Reid1, Allison Silver1, Alexandra Joshi-Inver1, Joseph Pancrazio1, and Valerie Voit1 1University of Texas at Dallas, Richardson, TX

SAT-116 Injury Metric Sensitivity in FE ATDs and the GHBM M50-OS to Small Boundary Condition Perturbations
David Shumate1, Demek Janow1, F. Scott Gayleyski1, Ashley Weaver1, and Joel Stiell1 1Wake Forest School of Medicine, Winston-Salem, NC

SAT-117 The Pressure Pointe: Assessing Forces on Young Dancers’ Feet during Ballet
Susan Hallbeck3, Catherine Davis1, Robert Sharnack2, and Delphine Daun1 1Worcester Polytechnic Institute, Worcester, MA, 2Rensselaer Polytechnic Institute, Troy, NY

SAT-118 Comparison of Compression-Based Mechanical Properties between Low-Cost Foam Materials and Skin for Tourniquet Application Training
Derek Viehlauser1, Alexander Hooli1, Bethany Loewdends1, and Susan Halfack1 1Mayo Clinic, Rochester, AZ, 2Arizona State University, Tempe, AZ, 3Mayo Clinic, Rochester, MN

SAT-119 Measurement of EMG of Reflex Responses to Wrist Perturbations Applied by an MRI Compatible Robot
Emily Patterson1, Andrea Zinner1, and Fabrizio Sargi1 1University of Delaware, Newark, DE

SAT-120 Design of a Non-Invasive Mouse Model for Post-Traumatic Osteoarthritis
Emma MacEwens1, Shayna Tomlinson1, and Devan Chen1 1Worcester Polytechnic Institute, Worcester, MA, 2Rowan University Polytechnic Institute, Troy, NY

SAT-121 Designing a Perfusion System for Decellularized Skin Leaf Scaffolds to Support Cell Function
Mallary Ferguson1, Stephen Renshaw2, Rose Robbins1, Katrina Hansen1, and Glenn Gaudette1 1Worcester Polytechnic Institute, Worcester, MA, 2Worcester Polytechnic Institute, Worcester, MA, 3Worcester Polytechnic Institute, Worcester, MA

SAT-122 De-phosphorylation of Osteopontin: Does it Affect Bone Fracture?
Fatin Alkhaledi1, Emily Rose Robbins2, Katrina Hansen3, and Delina Sheth1 1Wake Forest School of Medicine, Winston-Salem, NC, 2Arizona State University, Paradise Valley, AZ, 3Tokyo University of Agricultural Technology, Tokyo, Japan

SAT-123 Strain Patterns in the Patellar Tendon Assessed During Exercise Using Ultrasound Elastography
Grace Wayneg1, Hannah Goddorg1, Catherine Kuo1, Michael Richards1, Katherine Bchluss1, and Mark Buckley1 1University of Rochester, Rochester, NY

SAT-124 Relationship between Coordination Variability and Tibial Stress during Running
Hannah Anis1, Joseph Harrell1, and Stacey Meardon1 1University of Maryland, Baltimore County, Baltimore, MD, 2University of Massachusetts Amherst, Amherst, MA, 3East Carolina University, Greenville, NC, 4North Carolina State University, Raleigh, NC

SAT-125 Comparison of Viscoelastic Heating in the Nucleus and Annulus Fibrosus of Bovine Intervertebral Disc
Hansc Niemeyer1, Robby Boadle1, and Mark Buckley1 1University of Rochester, Rochester, NY, 2University of Utah, Salt Lake City, UT

SAT-126 Development of a 3D-Printed Myoelectric Powered Upper Limb Prosthetic for Transradial Amputees
Ian Pate1 1Washington University in St. Louis, St. Louis, MO

SAT-127 Validation of Agreement Between Muscular Models in FEBio2 and OpenSim
Jacob Altair1, Silvia Blemker1, and Brian Jones1 University of Virginia, Charlottesville, VA

SAT-128 Development of Rupture Testing Methodology for Eyeballs Using Intracocular Pressurization
Jacob Flower1, Natalie Pellez1, John Diezeldr1, Robert Sharpe1, and George Magrath3 1Clemson University, Summerville, SC, 2Clemson University, Clemson, SC, 3Medical University of South Carolina, Charleston, SC

SAT-129 Evaluation of Head Impact Exposure in High School Football Players by Position Group
Jessica Buice1, Amanda Esquivel1, and Christopher Andrecovich2 1University of Michigan-Dearborn, Dearborn, MI, 2Exponent, Inc.

SAT-130 Development Toward a Noninvasive Tear Glucose Sensor Employing an Engineered GDH-FAD
Jared Johns1, Anna Dang1, David Mattfeld1, Chi Lin1, Yuka Ito1, Koji Soda1, and Jeffrey Labelle1 1Arizona State University, Paradise Valley, AZ, 2Arizona State University, Tempe, AZ, 3Tokyo University of Agricultural Technology, Tokyo, Japan

SAT-131 Accuracy of the GForceTracker for Monitoring Head Impacts in Boys and Girls Lacrosse
Jessica Buice1, Amanda Esquivel1, and Christopher Andrecovich2 1University of Michigan-Dearborn, Dearborn, MI, 2Exponent, Inc.
Farmington Hills, MI
SAT-132 ARHGP36 and FOXR2 Role in Cellular Mechanoactivating and Force Transmission
Jonathan Makek,2, Ghanaid Sharma,1, David Oddis2,3, Pauline Jackson1,2, and David Langenkappe1
1University of Minnesota, Twin Cities, Minneapolis, MN, 2The University of Texas Southwestern Medical Center, Dallas, TX, 3University of California, San Francisco, CA

SAT-133 Compression, Relaxation, and Adhesion Properties of Hydrogels and an Organogel as Potential Synthetic Brain Phantoms
Allison Troup1,2, Shawn Potter1,2, and Jorge Rodriguez1,3
1SC Governor’s School for Science and Mathematics, Hattiesburg, SC, 2University of Maryland, Baltimore County, Baltimore, MD, 3U.S. Army Research Laboratory, Adelphi, MD

SAT-134 Swing Phase of the Gait Cycle Between Fallers and Non-fallers
Joseph Dimegdef,1, Arlette Geri2,3, Rahul Sooraga4,5, Sabea Razvanian1, Saba Razvanian1,6, Christopher Frames2,3,4, Victoria Smith1,4, Marky Olson7, and Thuron Lackman1
1Arizona State University, Tempe, AZ, 2Chapman University, Irvine, CA

SAT-135 Adaptations to Split-Belt User-Driven Treadmill After Induced Asymmetric Gait
Kelley Rappka1,2, Nicole Fey1, and Jill Higginson1
1University of Delaware, Newark, DE, 2University of California, San Francisco, CA

SAT-136 Nonlinear Evaluation of Gait in Older Fallers and Non-fallers
Kyle Xu1, Arlette Gelli1, Joseph Dimegde1, Rahul Sooraga2, Sabea Sooraga3, Sabea Razvanian1, Christopher Frames2,3,4, Tuan Nguyen1, and Marky Olson7
1University of Pittsburgh, Pittsburgh, PA

SAT-137 An Evaluation of Positioning an Advanced Human Body Model Using Open Source PIPER
Madeline Blankenship1,2, Berkan Guleyupoglu1,2, Bharath Koya1,2,3,4, Veerle De Pauw1,2,3, and Michael Frawley1
1University of California, San Diego, La Jolla, CA, 2Texas A&M University, College Station, TX, 3Virginia Tech, Blacksburg, VA, 4School of Medicine, Yale University, New Haven, CT

SAT-138 Field Measure to Estimate Vertical Leg Stiffness
Margaret Marshall1,2 and Richard Willy1
1East Carolina University, Greenville, NC, 2University of Tennessee, Knoxville, TN

SAT-139 The Effects of Hind Limb Suspension and Casting on Bone Strength
Mattheew Sarsawker1, Toni Speicher1,2,2, John H. Donahue1,2,2, and Anthony G. Locascio1
1The College of New Jersey, Ewing Township, NJ, 2Penn State College of Medicine, Hershey, PA, 3Virginia Commonwealth University, Richmond, VA

SAT-140 EMS Backbone Pad: An Inflatable Spinal Support System
Mawaz Luke1,2,3,4,5, and Rakesh Chhabildas1,2,3,4,5
1University of Pittsburgh, Pittsburgh, PA, 2Tissue Science Corp, Monroeville, PA, 3University of Pittsburgh School of Medicine, Pittsburgh, PA, 4Department of Biomedical Engineering, University of Pittsburgh, Pittsburgh, PA, 5Department of Orthopaedic Surgery, University of Pittsburgh, Pittsburgh, PA

SAT-141 Absence of a Primary Cilium in Osteocytes Results in Altered Actin Cytoskeletal Reorganization in Response to Fluid Flow
McKenzie Sup1,2, Michael Duffy1, and Christopher Jacobs1
1Columbia University, New York, NY

SAT-142 Bio-mechanic Applications in the Design of the Flexible Spine Fixation Devices
Megan Wiessner1, Steven Lefler1, and Jeffrey T. Lallie1
1Arizona State University, Tempe, AZ

SAT-143 Role of the A2B Adenosine Receptor in the Degradation of Cartilage in Rheumatoid Arthritis
Meghan Kupratis1,2, Mariano Lamriploc3,4,5, and Elise Morgan1,2,3,4,5
1Boston University, Boston, MA, 2Boston University School of Medicine, Boston, MA

SAT-144 Mechanical Analysis of Human Motion: Validation of Static Optimization and Computed Muscle Control
Michael L. Frawley1 and Anton J. van den Bogert1
1Cleveland State University, Cleveland, OH

SAT-145 Mechanical Properties of the Pulmonary Arteries in Normotensive and Hypertensive Rats
Michael Goody1, Danila Velez-Rendon1, Erica Pursell1, and Daniela Velez-Rendon1
1University of Illinois at Chicago, Chicago, IL

SAT-146 Relation of Lumbar Disk Degeneration and a New Condition: A Porcelain Finite Element Analysis
Nicholas Van Nest1
1Street Brooklyn, Stony Brook, NY

SAT-147 Novel Axial Forearm Loading Causes Short Term Changes to Distal Radius Microstructure in Young Women
Nicole Zaino1, Ying Feng1, and Karen Trow2
1Clarkson University, Potsdam, NY, 2Worcester Polytechnic Institute, Worcester, MA

SAT-148 Cortical Thinning in Lumbar Vertebrae of Astronauts on Long-Duration Spaceflight Missions
Nisha Subramanian1, Kyle McNamara2, and Ashley Weaver3
1University of California, Berkeley, Fremont, CA, 2Virginia Tech–Wake Forest University, Winston-Salem, NC

SAT-149 Bone Surface of 3D Fiber-Reinforced Hydrogels for Tumor Growth Studies
Rachel Dax1, Ngai To1, Ashish Williams1, James Nowaki1,5, Jonathan Samuel4, and Kristen Mills1
1Rensselaer Polytechnic Institute, Troy, NY

SAT-150 Blaxial Relaxation Properties of the Rat Vaginal Tissue
Davd Caza1, Alyssa Houston1, and Rebeilla De Vita1
1Virginia Tech, Blacksburg, VA

SAT-151 The Effect of Impactor Missile Design on Impact Severity for Playground Surfacing Assessment
Rebecca Mooney1,2
1Bucknell University, Lewisburg, PA, 2McGowan Institute for Regenerative Medicine, Baltimore, MD

SAT-152 Influence of Bracing on Kinematic Response of Occupants in Pre-Crash Evasive Swerving Maneuvers
Kobi Salem1, Charles Ho1, Ethan Douglas1, Valentina Garci1,2, Thomas Swirski2, and Kristy Afton2
1Center for Injury Research and Prevention, Children’s Hospital of Philadelphia, Philadelphia, PA, 2Bucknell University, Lewisburg, PA

SAT-153 Bone Strength in Rat Models subjected to Head-Only Proton Radiation
Rose LoForte1, Robert D. Hinck1, and Catherine M. Davis1
1The College of New Jersey, Ewing, NJ, 2Johns Hopkins University School of Medicine, Baltimore, MD

SAT-154 Boometric Smart Shoe Comparison to Vicon System
Ryan Bridgda1,2,3, Seong Moon1, Sabea Razvanian1, Christopher Frames2,3,4, Victoria Smith1, Rahul Sooraga4, and Thuron Lackman1
1Arizona State University, Tempe, AZ

SAT-155 Community Dwelling Measurement of Vitamin D, CHAMPS Questionnaire, and Time Up & Go Performance: A Case for Gait Experiments
Richard Johnson Samuel1,2, Seong Moon1, Sabea Razvanian1, Christopher Frames2,3,4, Victoria Smith1, Rahul Sooraga4, and Thuron Lackman1
1Arizona State University, Tempe, AZ

SAT-156 A Pseudo Rigid Body Model for Reducing Soft Tissue Artifact (STA): Results for STA Simulation and Standard Gait Experiments
Samuel Tucker1,2, Nina Yadvoyak1,2, Steven Kirsch1,2, Scott Haasend1, and Valentina Prifti1
1Cat Poly State University, San Luis Obispo, CA, 2Politecnico di Torino, Turin, Italy

SAT-157 Proposed Age and Gender Adjustments to the Hybrid III AID Scaling Procedure
Sean Maroney1,2,3, Scott Lutts4, and Nick Merrier1
1University of Pittsburgh, Pittsburgh, PA, 2Boston University, Boston, MA, 3Boston University School of Medicine, Boston, MA, 4University of Cincinnati, Cincinnati, OH

SAT-158 Design & Analysis of Shape-Memory Alloy Actuated Glove
Sean Vincent Herrera1 and Michael Zabala1
1Auburn University, Auburn, AL

SAT-159 Disruption of Gut Microbiome Alters Bone Tissue Composition
Sebastian Roubert-Martinez1, Jason D. Guss1,2, and Christopher J. Herzenberg1,2
1Cornell University, Ithaca, NY

SAT-160 The Effect of DMSO on the Mechanobiology of Lung Cancer Cells During Metastasis
Shaneey Veta1,2, Christopher Hare1, Don Gibbons2, and Kathryn Grande-Allen1,3
1Virginia Tech, Blacksburg, VA, 2Boston University, Houston, TX, 3M-DAnderson, Houston, TX

SAT-161 The Effects of an Osteoarthritis Unloader Brace on Knee Joint Space During Gait
Shanmug Yang1, Kenji Yasaka1, and William Andersen1
1University of Pittsburgh, Pittsburgh, PA

SAT-162 Nanomolar Drag Reducing Polymers (DRPs) Reduce Near-Wall Margination of Rigid RBCs in Microchannels: A Potential Therapy for Sickle Cell Disease
Shahena Gad,2, Daniel Crompton1,2, and Marina V. Kameneva1,3
1University of Pittsburgh, Pittsburgh, PA, 2McGowan Institute for Regenerative Medicine, Pittsburgh, PA

SAT-163 Characterization of Colitis and Control Bones
Silvia Alcazar1, Cory Linderman2, Siyu Pang3, and Ivona Jaksic1
1Weichita State University, Pratt, KS, 2University of Illinois at Urbana-Champaign, Urbana, IL

SAT-164 FEM Analysis of the Effect of Valgus Knee Condition on the Stress Distribution in Proximal Femur
Sofya Pugach1, Cahrody Hassan1, and Yi-Xian Qiu1
1Department of Biomedical Engineering, Stony Brook University, Stony Brook, NY

SAT-165 Application of PIPER Software to Adjust Spinal Position of Human Body Models in Military Relevant Postures
Sophia K. Tsukah1,2,3, Jannine R. Ara1,2, and Scott Gacy2,3,4
1Norfolk State University, Norfolk, VA, 2Virginia Tech, Blacksburg, VA, 3Rice University, Houston, TX, 4Virginia Commonwealth University, Richmond, VA

SAT-166 Comparison of Atlas-Based Finite Element Model to In Vivo Brain Motion During Low-Velocity Impacts
Tanner Friddle1,2, Logan Miller1,3, Jill Urbani1,3, Yuan Feng1, Philip Bayly3, and Joel Stitt1
1Wake Forest School of Medicine, Winston-Salem, NC, 2Wake Forest University, Winston-Salem, SC, 3Virginia Tech, Blacksburg, VA, 4Sichuan University, Sichuan, People’s Republic of, 5Washington University in St. Louis, St. Louis, MO
SAT-174 Microscopy with ultraviolet surface excitation (MUSE) for enhancing K-12 and undergraduate education in life sciences
Catherine Huang, Ronald Wood, and Steven Damrau
1University of Rochester, Rochester, NY, 2University of Rochester School of Medicine and Dentistry, Rochester, NY

SAT-175 MacRoAFM: A macroscopic model for high school and undergraduate education
Flaherty Roberts, Thomas Roberts, William Bagnall, and Vladimir Rekou
Clemson University, Clemson, SC

SAT-176 Micro-BLIP: A new tool for instrumentation education
Jake Donovan, Oliver Snyder, and George Steen
University of Pittsburgh, Pittsburgh, PA

SAT-177 Magnetic nanoparticles for the detection of matrix metalloproteinase-2 activity in tumor
Kawen Li, Taran Anand, and Allan David
Auburn University, Auburn, AL

SAT-178 A comprehensive comparison of five different methods to characterize theranostics
Matteo Galdiero, Andrea Fragone, and Antonio MacGregor
1Florida International University, Miami, FL, 2Pennsylvania State University, State College, PA

SAT-179 Effects of statin on endothelial cell inflammation when pretreated or post-treated with TNF-α
Thuy Le1, Matthew Hagen, and Matthew Hind1
Portland State University, Portland, OR, 2Oregon Health & Science University, Portland, OR

Track: Undergraduate Research, Design & Leadership, Biomedical Imaging and Optics

SAT-180 Cluster and quadrant analysis for thermographic breast cancer detection
Aidin Murray, Shamim Towfiq, and Pamela Xu
George Washington University, Washington, DC

SAT-181 Acoustoelectric imaging of nerve phantom using a 96-element phased array ultrasound transducer
Alex Burton, Yexian Qin, Pierre Ingram, Chef Preston, and Russell Witte
University of Arizona, Tucson, AZ

SAT-182 A rodent autofocusing module for whole slide imaging
Alexander Magarian, Juan Lis1, and Guan Zheng
1University of Nebraska Lincoln, Lincoln, NE, 2University of Connecticut, Storrs, CT

SAT-183 Determination of blood flow velocity profile from intravital microscopy using digital image cross-correlation
Alfredo Lucas, Vivek P. Jani, and Pedro Cabral
University of California, San Diego, La Jolla, CA

SAT-184 Linearly normalized 2D MR intensities reveal chemoresistance: Reportage specific differences within rectal tumor and adjacent non-tumor regions
Ammir Selvam, Jacob Antunez, Rajeev Thanevala, Kaustuv Barua, Justin Brady, Joseph Willis, Raj Paspalat, Anant Madabhushi, and Satish Vashishth
Case Western Reserve University, Cleveland, OH

SAT-185 Validation of multi-otsu thresholding for the quantification of choroidal neovascularization (CNV) lesion size in laser-induced CNV models
Anarea Puskar, Wenzong Liu, and Jennifer Kamp-Miller
1University of Illinois at Chicago, Chicago, IL

SAT-186 Dual-tuned removable common-mode current suppression trap for MRI
Angel Enrriquez and JosephRoselli
1University of Puerto Rico Mayaguez, Anasco, PR, 2University of Puerto Rico, Mayaguez, PR

SAT-187 Using regression analyses of brain imaging data to predict change in depression severity following cognitive behavioral therapy
Anthony Chedrawi, Harry Rubin-Falcone, Roni Kishon, Marie Oualid, John Mann, Jeffrey Miller, and Francesca Zanetti
1Virginia Commonwealth University, Richmond, VA, 2University of Pennsylvania, Philadelphia, PA

SAT-188 Time correlated single photon counting using an FPGA board
Anthony Zilinsky, Bassam Fasoul, and Ben Jenkins
Colorado State University, Fort Collins, CO

SAT-189 Math model of brain tumor growth facilitates tumor cell quantification from bioluminescence imaging
April F. Fleming, Jamie M. Chapman1, Samantha Schoell,1, Leon Lencz1, David Behar2, Anthony Marsili3, Jack Raia4, Ashley Webber, and Krister Breuer3
1Western Carolina University, Cullowhee, NC, 2Virginia Tech-Wake Forest University Center for Injury Biomechanics, Winston-Salem, NC, 3Wake Forest School of Medicine, Winston-Salem, NC, 4Wake Forest University, Winston-Salem, NC

SAT-190 Inter-subject variability in Healthy TES Recipients: A Computational Study
Bakir Mousa1, Aparnita Nath2, Maya Boggs3, Charles Caskey4, Kevin Castellano5, Aditya Kasniah6, Chun Chau7, Thomas Marsaro2, and Ronald Sadler8
1Arizona State University, Tempe, AZ, 2University of Florida, Gainesville, FL

SAT-191 Platform for skeletal muscle tissue clearing for fluorescent reporters and immunofluorescence staining
Bhavani Sai Boithal Murukeshan1, Maganer Vemula1, Yoko Asakura2,3, and Atsushi Asakura1,2,4
1University of Minnesota, Minneapolis, MN, 2University of Minnesota Medical School, Minneapolis, MN, 3Stein Cell Institute, Minneapolis, MN, 4Paul D. Boyce Wettlaufer Muscle-Dystrophy Center, Minneapolis, MN

SAT-192 Methods for measuring dry mass change in time-lapse gradient light interference microscopy
Brittany McKee, Michael Kandel, Ghalil Kazemzargar, Martha Gilliet1, and Gabriel Popescu
University of Evansville, New York, NJ, 2University of Illinois at Urbana-Champaign, Urbana-Champaign, IL

SAT-193 The relationship between resting-state fMRI low frequency fluctuations and cerebral hemodynamics
Chantelle Lim1, Baxter Rogers2, and Victoria Morgan1
1University of Rochester, Rochester, NY, 2Yanderbilt University, Nashville, TN

SAT-194 Magnetoecephalography analysis of the 40Hz auditory steady-state response in first episode patients with schizophrenia
Charles Ellis1, Timothy Gavin1, Gregory Overbeck1, Jeffrey Keller2, David White1, Meredith Reid3, and Adrienne Lahti2
1Arizona State University, Tempe, AZ, 2Mayo Clinic, Rochester, MN, 3Vanderbilt University, Nashville, TN

SAT-195 Simulation-based optimization of ultrasound adapters for brain slice neuromodulation
Charles Naumann1, Marshall Prupp1, and Charles Caskey
Yanderbilt University, Nashville, TN

SAT-196 Simulation-based optimization of ultrasound adapters for brain slice neuromodulation
Yanderbilt University, Nashville, TN

SAT-170 A novel spherical stent for occlusion of cancer and aneurysm
Hao-Ming Hsiao, Wen-Hsin Yang, Tzu-Yuan Lin, Chen-En Liu1, and Jiong-Hong Chen
1National Taiwan University, Taiwan, 2University of Rochester, Rochester, NY

SAT-171 Feasibility of using the chichoroidal analytic membrane model to test constancy of angioarchitecture per time
William Carlson1 and Christopher Quick1
1Virginia Commonwealth University, Richmond, VA, 2Northwestern University, Evanston, IL

SAT-172 Changes in muscle architecture during isometric contractions in stroke survivors
Zoe Villarreal, William Rymer, Zongyao Song2, and Fatemeh Saadat3
1Virginia Commonwealth University, Richmond, VA, 2Northwestern University, Chicago, IL

Track: Undergraduate Research, Design & Leadership, Biomedical Imaging and Optics

SAT-173 An application of mHealth technologies for treatment of plantar fasciitis
Benjamin Stumpf1, Jack McGraw2, Ryan Gilbert1, Alex Girard1, Vladimir Rekou1, and Eddie Bear1
Clemson University, Clemson, SC

Biomedical Engineering Education (BME)-Undergraduate
SAT-197    Cardiac Segmentation approached by Way of Convolutional LSTM Network
Chris Petty1,2
1Clemson University, Westen, CT

SAT-198    TwitchRead: Analyzing Contraction in Engineered Skeletal Muscle Tissue Co-Cultured with Neurons
Daniel Carbonero1, Rachel Besser1, and Ashutosh Agarwal2
1University of Miami, Coral Gables, FL

SAT-199    A Convolutional Neural Network-based Algorithm for Targeting Relevant Diagnostic Sites in HRME Images
David Blamey1, Eric Torny2, Arvind Vigneswaran1, Ann Gillenwater1, and Rebecca Richards-Kortum2
1Duke University, Durham, NC, 2Rice University, Houston, TX, 3University of Texas, Houston, TX

SAT-200    The Quantitative Assessment of Ultrasound Backscatter in 3D Printed Phantoms
Dhruv Bhaskar1, Samantha Faulkner1, Trevor Mitcham1, Bagrat Grigoryan2, Wolfgang Stefan1, Jordan Miller1, and Richard Bouchard1
1University of Texas MD Anderson Cancer Center, Houston, TX, 2Case Western Reserve University, Cleveland, OH

SAT-201    Source Localization of Cortico-Cerebellar Activity
Ethan Kwan1 and Dilano Saldin2
1San José State University, San José, CA, 2University of Georgia, Athens, GA

SAT-202    Semi-automated Analysis of Microembolic Lesions in Brain Diffusion Weighted MRI
Gregory Wheeler1, Liu Dai1, Wei Zhu1, and Theodore Trouard1
1University of Arizona, Tucson, AZ

SAT-203    Angiogenesis II-Induced Hypertension Does Not Lead to Dissecting Aortic Aneurysms in Apolipoprotein E-Deficient Rats
Hanna Qureshi1, Evan Phillips1, and Craig Goergen1
1Purdue University, West Lafayette, IN

SAT-204    Reducing Error in Ultrasound Elasticity Imaging via 3D Simulation of Human Tendon
Hamza Schmidt1, Andreas Nuruzz Zuniga1, Cindy Faste1, Daniel Latt2, and Russ Wilts1
1The University of Arizona, Tucson, AZ

SAT-205    SERIES Array for Detection of Biomarkers Using Metallic Nanoparticles
Hamish Smith1, Andrea Locke1, and Gerard Cote1
1Texas A&M University, College Station, TX

SAT-206    Development of a Rodent Restraint System to Study Brain Networks in Absence of Anesthetic Agents
Iash Thomas1, Hisham Temmar1, Ayende Ibere1, Maysam Nezafati1,2, and Sheila Khedr1
1Georgia Institute of Technology, Atlanta, GA, 2Emory University, Atlanta, GA

SAT-207    Transient Optical Scattering as an Imaging Contrast Mechanism for Molecular-Scale Dynamics in Tissues
Janet Sourdee1,2,3, Joanne Lu1, Andrew Bower2, Pin-Chih Huang3, and Stephen Boppart4
1University of Rochester, Rochester, NY, 2University of Illinois at Urbana-Champaign, Urbana, IL

SAT-208    Improving Radial GRAPPA Efficiency by Reconstructing Multiple Points from a Single Weight Set
Evam Caming1, Dominique Franson1, Jesse Hamilton1, and Nicole Seiberlich1
1Case Western Reserve University, Cleveland, OH

SAT-209    Spiral Catheter With 1550nm Fiber-Bragg Grating and Mach-Zehnder Interferometer Touch Sensors for Accurate Atrial Electroanatomic Mapping
Grace Jeangie1, Ji-Ky1, and Malee Fok1
1San José State University, San José, CA, 2University of Georgia, Athens, GA

SAT-210    Algorithm for Targeting Relevant Diagnostic Sites in HRME Images
Daniel Carbonero1, Rachel Besser1, and Ashutosh Agarwal2
1University of Miami, Coral Gables, FL

SAT-211    Contrast Mechanism for Molecular-Scale Dynamics in Tissues
Janet Sourdee1,2,3, Joanne Lu1, Andrew Bower2, Pin-Chih Huang3, and Stephen Boppart4
1University of Rochester, Rochester, NY, 2University of Illinois at Urbana-Champaign, Urbana, IL

SAT-212    Hybrid Spectroscopy Imaging System for In Vivo Tissue Differentiation: System Development
Juan Giraldos1 and Wei-Chiang Lin2
1Flinders International University, Miami, FL

SAT-213    Automatic Bolus Detection for Dynamic Contrast-Enhanced Imaging with Undersampling
Jordi Park1,2, Fatenah Respo-Oguz3, Linda B. Anderson1, and Richard Fryxell1
1University of California, Atlanta, CA, 2University of Alabama, Tuscaloosa, AL

SAT-214    Hybrid Vascular Permeability Changes in a Rat Model of Diabetic Retinopathy
Jason Wu1, Patrick Magness1, Michael Lui2, Jennifer Kang-Mieler1, and Kenneth Tahara2
1University of Illinois at Urbana-Champaign, Urbana, IL, 2University of California, Santa Cruz, Santa Cruz, CA, 3Institute of Technology, Chicago, IL

SAT-215    3D Murine Brain Cartography: Reconstruction using SLIM (Spiral Interferometry Microscopy with Ultrasound)
Sajad Dehajestami1,2,3, and Sanaz Dadkhah1
1The University of Texas at Austin, Austin, TX

SAT-216    3D Murine Brain Cartography: Reconstruction using SLIM (Spiral Interferometry Microscopy with Ultrasound)
Sajad Dehajestami1,2,3, and Sanaz Dadkhah1
1The University of Texas at Austin, Austin, TX

SAT-217    Synthesis of DNA-Antibody Constructs for Studying Nucleic Acid Hybridization Kinetics in Live Cells
Jillian Oster1, Yuan Chen2, Xin Chen1, and Tim Yeh1
1The Georgia Institute of Technology, Atlanta, GA, 2The University of Texas at Austin, Austin, TX

SAT-218    Simulation of DNA-Antibody Constructs for Studying Nucleic Acid Hybridization Kinetics in Live Cells
Jillian Oster1, Yuan Chen2, Xin Chen1, and Tim Yeh1
1The Georgia Institute of Technology, Atlanta, GA, 2The University of Texas at Austin, Austin, TX

SAT-219   sources of Medical Images
Jordi Park1,2, Fatenah Respo-Oguz3, Linda B. Anderson1, and Richard Fryxell1
1University of California, Atlanta, CA, 2University of Alabama, Tuscaloosa, AL

SAT-220    Automatic Bolus Detection for Dynamic Contrast-Enhanced Imaging with Undersampling
Jordi Park1,2, Fatenah Respo-Oguz3, Linda B. Anderson1, and Richard Fryxell1
1University of California, Atlanta, CA, 2University of Alabama, Tuscaloosa, AL

SAT-221    Hybrid Spectroscopy Imaging System for In Vivo Tissue Differentiation: System Development
Juan Giraldos1 and Wei-Chiang Lin2
1Flinders International University, Miami, FL

SAT-222    Automated Segmentation Algorithm for Thermal Images
Zarnab Mahmodii1, Katherine Ferguson1, and Nada Karmouz1
1The George Washington University, Washington, DC

SAT-223    Correction of Gibbs Ringing Artifact in DW-MRI with Biomimetic Brain Phantom as Ground Truth
Katherine Richter1
1University of Pittsburgh, Pittsburgh, PA

SAT-224    The Investigation of Organ Dose Reduction in Head CT Scans Due to Head Angle Adjustments
Katherine Rohde1,2, and R. Marc Lebel1,2,3
1University of Puerto Rico at Mayaguez, Trujillo Alto, PR, 2University of Illinois at Urbana-Champaign, Urbana, IL

SAT-225    Measuring the Change of Mitochondrial Membrane Morphology in RSV Infected MH-S Cells using Kayed Alferi, Abidhi Marer1, Peter Kner1, and Jocelyn Grunwell2
1California State University, Long Beach, Long Beach, CA, 2University of Georgia, Athens, GA, 3Emory University, Atlanta, GA

SAT-226    Assocations between Functional Connectivity and Walking in Multiple Sclerosis Patients
Kyle Poul, Rachel Bollani1, Elizabeth Hubbard1, Curtis Johnson1,2,3, and Walking in Multiple Sclerosis Patients
1The University of Texas at Austin, Austin, TX

SAT-227    Murine Medial Femoral Condyle Growth Plate Profile Varies with Orientation of Histology Section
Laura Vasquez-Bollani1, Leering Liu1, Marissa Keller2, Felis Hu1, Anna Plaan1, and Robert Salt1
1Case Western Reserve University, Cleveland, OH, 2University of Minnesota, Minneapolis, MN

SAT-228    Aggregation of Copper Sulfide Nanoparticles Around Nanoscale Targets for Photoacoustic Contrast in a Flow Model
Madeline Howell1, José Lu1, Christopher Miranda1, and Barbara Smith1
1Arizona State University, Tempe, AZ

SAT-229    Stabilizing a Reference Laser for a Modified Michelson Interferometer
Marcella Huang1, Johnmie Mittal2, Bryonna Beason2, and Theodore Correa-Valdivia3
1Duquesne University, Pittsburgh, PA, 2American Chemical Society Project SEED, Duquesne University, Pittsburgh, PA

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SAT-230  Oxygen Nanobubble Formation as a Mechanism of Thermally Induced Erithrocyte Aggregation
Joey Blasco1, Arianna Jean-Frances1, Samantha Webber-Fahsli1, Geoffrey Gunter1, Harrison Schedler1, and Mary Frame1
1 Stony Brook University, Stony Brook, NY

SAT-231  Detection of Newly Formed Blood Vessels Using Label-Free Optical Molecular Imaging
Meri-Pauline Unerzetz1, Sisan You1, Jamila Heid1,2, Eric Cheney1, Marina Niermanova1, and Stephen Boppard1
1 University of Rhode Island, Providence, RI, 2 University of Illinois at Urbana-Champaign, Urbana, IL

SAT-232  Fourier Transform Infrared Spectroscopy as a Tool for Analyzing Diffractive Bile Markers in Concentrations in Liver Tissue Biopsies
Miranda Deshock1, Sanita Tava1,2 (Shonika Mathur1, Sayee Anok1), and Rohit Bhandarg1
1 University of Illinois at Urbana-Champaign, Urbana, IL, 2 Beckman Institute, Urbana, IL

SAT-234  Design and Characterization of Phantom Materials for Ultrasound Elastography Research
Mohamed Salah Mahmoud1, Penelope Subervi1, and Stephen McAteer1
1 University of Rochester, Rochester, NY

SAT-235  Variability of Image Texture Quantification in Simulated Medical Imaging Systems
Nada Kamoun1,2, Benjamin Berman2, and Qin Li2
1 The George Washington University, Washington DC, DC, 2 University of Illinois at Urbana-Champaign, Urbana, IL

SAT-236  Creation of In Vivo Imaging Support System Using Additive Manufacturing
Natalie Mueller1, J Timothy Doughty1, and Teresa A Murray2
1 Louisiana Tech University, Ruston, LA, 2 University of Pittsburgh, Pittsburgh, PA

SAT-237  Optimizing Geometry of a 64-channel RF Head Coil
Nechtac Viragom1, Tales Santini1, Sossena Wood1, and Tamer Ibrahim1
1 University of Texas at El Paso, El Paso, TX, 2 University of Illinois at Urbana-Champaign, Urbana, IL

SAT-238  MoleLens: Smartphone Based Polarized Imaging for Validating Diffuse Optical Blood Flow Imaging
Yuxiao Wei1, Joe Gardecki2, and Gary Tearney2
1 University of Illinois at Urbana-Champaign, Urbana, IL, 2 Beckman Institute for Advanced Science and Technology, Urbana, IL

SAT-240  Development of a Brain Stage II-Integration of the Cerebrovascular System
Ryan Branco1, Peyton Tharp1, Evan Kating1, Savannah Dale1, and Jorge Rodriguez1
1 Clemson University, Clemson, SC

SAT-241  Evaluation of Segmentation Performance with 3T and 7T Magnetic Resonance Imaging using FreeSurfer
Shane Mishkan1, Anusha Raguraman1, Minju Wu1, Tales Santini1, Tamer Ibrahim1, Oscar Lopez1, and Howard Aizenstein1
1 University of Pittsburgh, Pittsburgh, PA

SAT-242  Characterizing Tissue Autofluorescence To Enhance Visualization of Fluorescent Biomarkers
Su Hyun Lyu1, Jiao Lagoart1, and Laura Marro1
1 University of California, Davis, CA

SAT-243  Cellular Topological Growth Limits Affect Melanoma Phenotype
Tham Huyt1, Jamila Heid1,2, Minwoo Kim1, Sisan You1, Jummin Lee1, Iwona Dobrucka1,2, Kristopher Kielen1, Stephen Boppard1,2, Michael Isaacson1,2, and Lawrence Dobruss1
1 University of Illinois at Urbana-Champaign, Urbana, IL, 2 Beckman Institute for Advanced Science and Technology, Urbana, IL

SAT-244  Gradient-Based Manipulation of the Prostate Capsule and Lesion on MRI Using Microsoft Holosense
Yashik Chen1, Soumara Ghose1, Lee Powery1, and Anant Madabhushi1
1 Case Western Reserve University, Cleveland, OH

SAT-245  Development of a Dual Modality Gastrintestinal Capsule for Optical Coherence Tomography (OCT) and Near-Infrared Fluorescence (NIRF) Imaging
Yashik Chen1, Joe Gardner1, and Gary Teepson2
1 Duke University, Durham, NC, 2 Massachusetts General Hospital, Boston, MA

SAT-246  Kidney as Verification of Microsphere Methods for Validating Diffuse Optical Blood Flow Measurement
Zhiping Liu1, Ashley Proctor1, Gabriel Ramirez1, Songfang Han1, Tracy Bulbul1, and Regine Choo1
1 University of Rochester, Rochester, NY

SAT-247  Track: Undergraduate Research, Design & Leadership, Cancer Technologies
Cancer Technologies-Undergraduate

SAT-248  Angiogenesis in an In Vivo Vascular Model of Inflammatory Breast Cancer
Ambert Bush1, Peter Gal9, and Mary Alpaga1
1 Rowan University, Glassboro, NJ

SAT-249  In Vivo Model for Studying the Effects of LPS On Astrocytes in the Brain Tumor Microenvironment
Andrea Kulash1, Megan Cox2, Liesi Lu1, and Scott Verbridge1
1 Virginia Polytechnic Institute and State University, Blacksburg, VA, 2 The University of Texas at Austin, Austin, TX

SAT-250  Ovarian Cancer Cells Induce the Differentiation and Subsequent Polymerization of Monocytes to an Activated Macrophage Phenotype
Andrew Miller1, Kaitlin Fogg1, and Pamela Knepper1
1 University of Wisconsin-Madison, Madison, WI

SAT-251  The Effects of Cold Atmospheric Plasma on Cell Migration and Expression of Adhesion Molecules on Cervical Cancer Cells
Asal Ganj1, Nicole Sosa1, Tony Zou1, David Burnette1, and Monica Burdek1
1 Ohio University, Athens, OH

SAT-252  Characterization of Biocompatible Scaffolds for Modeling Tumor Microenvironments
Carolyna Quiles1, Tomi C1, and Rohit Bhandarg1
1 University of Virginia, Charlottesville, VA, 2 University of Illinois at Urbana-Champaign, Urbana, IL

SAT-253  Synthetic Conditions of Iron Oxide Nanoparticles for Magnetic Hyperthermia Therapy
Dalton Kothari1,2, Lara Heersema2, Stephanie Hufnagel3, Zheqiang Cui1, and Hugh D.C. Smyth1
1 South Dakota School of Mines & Technology, Rapid City, SD, 2 The University of Texas at Austin, Austin, TX

SAT-254  The Role of Varying Doses and Sources of Radiation on Epithelial Cells
Mary June Bezn1, Suzanne Bradley1, Donald Meddin1, and A. Mahfuzur Reza2
1 Case Western Reserve University, Cleveland, OH

SAT-255  The Role of the Extracellular Matrix in the Breast Cancer Resistance to Paclitaxel
Donna Mullick1, Hunter Joyce1, and Amy Brack1
1 Worcester Polytechnic Institute, Worcester, MA, 2 The University of Texas at Austin, Austin, TX

SAT-256  Mechanical Stress Increases Yap/Taz Nuclear Localization and Chemoresistance in Breast Cancer Cells
Gabriel Garcia1, Adrienne Spencer2, and Aaron Baker2
1 University of Texas at El Paso, El Paso, TX, 2 The University of Texas at Austin, Austin, TX

SAT-257  Macrophage Response to Stiffness is Angiogenic
Gabriela Perez-Lozano1, Shane Allen1, Adiel Hernandez2, Adele Ambrepu1, and Laura Sugg1
1 The University of Texas at Austin, Austin, TX, 2 The University of Miami, Miami, FL

SAT-258  Internalization of Near-Infrared-Absorbing Nanorods for the Photomechanical Ablation of Cancer Cells
Ian Stinson1, David Auyong1, Austin Mayo1, and James Tunnel2
1 Virginia Polytechnic Institute and State University, Blacksburg, VA, 2 The University of Texas at Austin, Austin, TX

SAT-259  Biomechanical and Biophysical Approach to Profile Metastatic Cancer Cell Migration
Jacob Enders1, Ayush Garg1, Carlos Castro1, and Jonathan Song1
1 The Ohio State University, Columbus, OH

SAT-260  Microfluidic Co-Culture of Breast Cancer Cells and Adipose Stem Cells
Katia A Bender1, Joshua M Campbell2, Shari M Rahman2, Elizabeth C Miller1, and Adam T Mclern1
1 Louisiana State University, Baton Rouge, LA

SAT-261  Optimization of a Microfluidics Device for the Cell Separation of P98 Rat Glia Cells from Primary Rat Astrocytes
Kylie Klinkowski1, Megan Logun2, Wujin Zhao1, Leidong Muo2, and Lohithash Karumambash3
1 University of Massachusetts Amherst, Amherst, MA, 2 University of Georgia, Athens, GA

SAT-262  Characterization of the Primary Binding Interactions in CAR-T Therapy
Liam Doyle1, Matthew Diogioso1, Meaghan Gevey1, Wenpeng Cai2, Brendan Curren1, and X. Frank Zhang1
1 Lehigh University, Bethlehem, PA

SAT-263  Adapting NeuroVascular Unit (NVU) Organ- on-chip to Examine Breast-to-brain Metastases
Emily Schuler, Dereck Markoff, Philip Fryinger, Tyler Moser, and Lisa McCawe
1 Vanderbilt University, Nashville, TN

SAT-264  Agent-based Modeling of the Glioblastoma Tumor Microenvironment
Lynette Sequerra1, Jessica Yuen1, Daniel Logsdon1, and Jennifer Munson2
1 University of Virginia, Charlottesville, VA

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SAT-294
Computation Modeling of Clotting Blood
Emily Sismona1, Francesca Costantini1, Amir Awadakran1, and Michael Mazza1
1University of Dayton, Dayton, OH, 2Pennsylvania State University, University Park, PA

SAT-295
Investigation of Regional Cardiac ECM Derived Hydrogels for Myocardial Infarction Treatment
Sara Sali1, Emily Mulvaney1, Yen Jee Wu1, Virginia Leigh Mease-Smith2, Yi Hong2, and Gia Zhang2
1The University of Akron, Akron, OH, 2University of Texas at Arlington, Arlington, TX

SAT-296
Local Fluid Forces Regulate Endothelial Hydraulic Conductivity
Griffin Spytykaitis1, Ehsan Akbari1, Kauhik Rangharajan1, Shaurya Prabhakar1, and Jonathan Sim1
1The Ohio State University, Columbus, OH, 2The Ohio State University Comprehensive Cancer Center, Columbus, OH

SAT-297
Novel Approaches to Simultaneously Monitor and Analyze Electrocardiographic of Zebrafish
Ang Shere1, Isaac Clark1, Shioz Kubota1, Michael Lenning1, Peter Hofsteen1, Jingchun Yang2, Xiaolei Xu2, and James Baish1
1University Park, PA

SAT-298
Generating Device for In Vitro Cardiovascular Systems
Jenna Mosier1, Rachel Hybart1, Amber Kay2, James A. Stewart, Jr.2, Benjamin Twigg1, Benjamin Derleth1, Luke Riexinger1, Lance Munn2, Ang Sherpa1, Isaac Clark1, Silviu Gruber1, Wyatt Moore1, Sara Salem1, Emily Mulvaney1, Shion Kubota1, and Michael Sacks1
1University of Pennsylvania Perelman School of Medicine, Philadelphia, PA

SAT-299
Insights from Physical and Electrical Analogs of Multi-Lymphangion Systems
Benjamin Tegtg1, Benjamin Derleth1, Luke Riexinger1, Lance Munn2, and James Baish1
1Bucknell University, Lewisburg, PA, 2Massachusetts General Hospital/Harvard Medical School, Boston, MA

SAT-300
Effect of Fetuin-A as Protein Therapy for Cacciﬁcation of Vascular Smooth Muscle Cells
Jenna Mosier1, Rachel Hybart1, Amber Kay1, James A. Stewart, Jr.1, and C. Ludhan Simpson1
1Mississippi State University, Mississippi State, MS, 2University of Mississippi, University, MS

SAT-301
Design of an Actuated Pressure Waveform Generating Device for In Vitro Cardiovascular Experiments
Kalegh Neely1, Ryan Danahy1, Paul Capobiancio1, Mitra Shabani1, Masoud Farahmand1, and Ethan Kung1
1Clemson University, Clemson, SC

SAT-302
Computational Modeling of Clotting Blood
Emily Sismonda1, Francesca Costantini1, Amir Awadakran1, and Michael Mazza1
1University of Dayton, Dayton, OH, 2Pennsylvania State University, University Park, PA

SAT-303
Amputated UFP Exposure Impairs the Integrity of the Gut Vascular Barrier
Mark Gutin1, Kyung In Baek2, Tsung Hsiang1, Li Rongsong1, and Constantinou Sourounek1
1Department of Biology, University of California Los Angeles, Los Angeles, CA, 2Department of Bioengineering, University of California Los Angeles, Los Angeles, CA. 3Division of Cardiology, Department of Medicine, University of California, Los Angeles, CA, 4Division of Cardiology, Department of Medicine, Los Angeles, CA, 5UCLA, Los Angeles, CA

SAT-304
Mechanical and Histological Characterization of Regurgitant Mitral Valve Anterior Leaflets
Michelle Lu1, Nivedita Rai1, Jessica Kim1, Bruno V. Regis1, Salma Ayoub1, and Michael Sacks1
1Institute for Computational and Engineering Sciences, Austin, TX

SAT-305
Modeling Heart Disease Using Mechanically Dynamic Magnetorheological PDMS Substrates
Myan Bhosopalan1, Elise Corbin1, Alexes Vite1, and Kenneth Margules1
1University of Pennsylvania Perelman School of Medicine, Philadelphia, PA

SAT-306
Impact of Collateral Vessels on the Hemodynamics in a Coronary Bypass Graft: A Computational Study
Nadia Francis1 and Stephanie Goszka2
1Fuk University, Nashville, TN, 2East Carolina University, Greenville, NC

SAT-307
Characterization and Expansion of Human-induced Pluripotent Stem Cells Derived Mural Cells
Nicole Zambrana-Garcia1, Bra Madin2, and Sharon Gerchik2
1University of Puerto Rico, San Juan, Puerto Rico, 2Johns Hopkins University, Baltimore, MD

SAT-308
Histological Assessment of Elastin Fiber Orientation in Non-Human Primate Aortic Valves After Flex Flow Treatment
Nidi Suthar1, Brittany Gonzales1, Alejandro Pinnó1, Manuel Perez1, Jessica Romo1, Romina Ramaswamy1
1Florida International University, Miami, FL, 2Johns Hopkins University, Baltimore, MD

SAT-309
Mitral Valve Leaflet Characterization under In Vivo Stresses Using a Novel Biaxial Bioreactor
Nivedita Rai1, Michelle Lu1, Brenna Rodriguez1, Jessica Kim1, Jordan Greaves1, Salma Ayoub1, and Michael Sacks1
1University of Texas at Austin, Austin, TX

SAT-310
Recreational Microenvironment of Cardiac Tissue at Different Stages of Cardiac Fibrosis
Phu Nguyen1, Rashel Foroosh1, Matthew Sui1, and Srivatsan Kodialam1
1University of Nebraska Lincoln, Lincoln, NE, 2University of Nebraska-Lincoln, Lincoln, NE

SAT-311
Stimulation of Elastic Fiber Proteins by Mesenchymal Stem Cell-Derived Factors
Rashel Sideei1, Kaori Sugiyama1, Aneesh Ramaswamy1, David Vor7, Himangi Yekanagere1, and Justin Weinbaum1
1University of Pittsburgh, Pittsburgh, PA, 2University of Tsukuba, Tsukuba, Japan

SAT-312
Electrosyn Polyi(-caprolactone) Scaffolds for Tissue Engineered Vascular Grafts (TEVG)
Rashed Young1 and Justin Brown1
1Lafayette College, Easton, PA, 2The Pennsylvania State University, State College, PA

SAT-313
Optimization of Robust Aortic Valve Cell Culture on Variable Stiffness Substrates for Study of Differential Cellular Response in 3D Hydrogel Systems
Rebecca Resnickova1, Madeline Monroe1, and Jane Grande-Alen1
1Rice University, Houston, TX

SAT-314
Dual Use of Optical Mapping and Sharp Microelectrodes as a Platform to Study the Electrophysiology of Mouse Hearts
Khoa Ho1, Leilah Brennan1, and Igor Efimov1
1The George Washington University, Washington, DC

SAT-315
Developing a Bioink to 3D Print Aortic Valve Leaflets
Sai Li1, Alina Yanezawa1, and Michael Davi1
1Georgia Institute of Technology and Emory University, Atlanta, GA

SAT-316
Slow Release of Growth Factors from Silk-ECM Scaffolds for Cardiovascular Tissue Engineering Elizabeth C. Bender1, Whitney L. Stoppel2, Jonathan M. Grassman1, Lauren D. Black3, III1, and David L. Kaplan1
1Tufts University, Medford, MA, 2University of Florida, Gainesville, FL, 3Tufts School of Graduate Biomedical Sciences, Boston, MA

SAT-317
Quantification of Cardiac Function in a Rat Model of Myocardial Infarction Using a Custom MATLAB Script for Pressure-Volume Loop Analysis
Roc C. Breherton1, Whitney L. Stoppel2, Kelly E. Sullivan1, Jonathan M. Grassman1, David L. Kaplan1, and Lauren D. Black3, III1
1Tufts University, Medford, MA, 2University of Florida, Gainesville, FL, 3Amergin Innov, Cambridge, MA. 4Tufts School of Graduate Biomedical Sciences, Boston, MA

SAT-318
Assessment of Patient Hemodynamics Pre-Left Ventricular Assist Device Implant to Determine Chance of Right Ventricular Failure
Yousef Shehata1, Marc Simon1, and Toshiyuki Bachman1
1University of Pittsburgh, Pittsburgh, PA

SAT-319
Computational Fluid Dynamic Analysis of Neonatal Aortic Valve Post Balloon Valvuloplasty
Denise Medina1, Sara Naismith1, Alexander Williams1, and Sharan Ramaswamy2
1Florida International University (FIU), Miami, FL

SAT-320
An Experimental and Computational Framework to Study Endothelial Barrier Remodeling in Vessel Networks During Embryonic Development
Zachary Sexton1, Joshua Morgan1, and Jason Gleghorn1
1University of Delaware, Newark, DE

SAT-321
Track: Undergraduate Research, Design & Leadership, Cellular and Molecular Bioengineering Cellular and Molecular Bioengineering-Undergraduate

SAT-322
SK-BR-3 Breast Cancer Cells Exhibit Rolling Behavior When Perfused Over P-Selectin Under Hydrodynamic Flow Conditions
Alexandra Deremer1, Nathan Reynolds1, and Monica Burdick1
1Ohio University, Athens, OH

SAT-323
Using CRI SpyR to Selectively Target Cancer Cell Lines via Synthetic Lethal Interactions
Amanda Hornick1, Stan Wang2, and George Church1
1University of Rochester, Rochester, NY, 2University of Chicago, Chicago, IL

SAT-324
Design and Optimization of a Cholesterol-Binding Peptide Based on the Cholesterol Recognition Motif Acceptor Consensus Motif
Anshula Sinani1, Evan Kouflos2, and Angela Brown1
1Lehigh University, Bethlehem, PA, 2Lehigh University, Bethlehem, PA

SAT-325
Traumatic Brain Injury Induces Endogenous Neural Stem Cell Activation
Audrey Hsu1, Jeremy Anderson2, and Li Cai2
1UC San Diego, La Jolla, CA, 2University of Ottawa, Ottawa, Canada

SAT-326
Characterization of Cell-Cell Junction Changes Associated with the Formation of a Strong Endothelial Barrier
Benjamin Nguyen1, Mary-Paige McElrath2, Lindsay LaFratta1, and Daniel H. Lefkowitch1
1Virginia Commonwealth University, Richmond, VA
SAT-336 An Engineered Polysaccharide Lyase to Combat Toxic Algal Blooms
Evan Eckerle1, and Bryan Berger1
Lehigh University, Bethlehem, PA

SAT-337 The Role of c-eb in E-synuclein-induced Cell Death: Efficacy of Nilotinib in Parkinson’s Prevention
Harwees Moon1,2, Hyun Hee Kim1, Ted M. Dawson1, and Valina L. Dawson1
University of Massachusetts, Columbia, MD, Massachusetts Institute of Technology, Cambridge, Boston, MA

SAT-339 Optimization of Biotinylated Protein Elution from Streptavidin Conjugated Beads for BioID Analysis
Jaleen Chaw12, and Scythos Yamasaki1
University of California, Davis, Davis, CA

SAT-340 Analysis of Cell Phenotype Adaptation Following Inducible Cas9 Mediated E-cadherin Knockout
Jaleen Chaw1, and Scythos Yamasaki1
University of California, Davis, Davis, CA

SAT-341 Genetic Perturbation And Analysis of an NR2F2-JUND-p53 Regulatory Network in Breast Epithelia
Joseph Burn1, Elizabeth Pereira1, and Kevin James1
University of Virginia, Charlottesville, VA

SAT-342 PtSdr-Gas6 Interaction Promotes Cell Migration Via AXL
Joshua Mesfin1,2, and Jasminne Pérez3
University of Texas Southwestern Medical Center, Dallas, TX

SAT-343 Towards the Development of a Protein-Based Extracellular Tension Sensor
Julie Malewski1,2, Karsee Collins1, and Brenton Hoffman1
Rutgers University, New Brunswick, NJ, Duke University, Durham, NC

SAT-344 Role of Nesprin in Mesenchymal Stem Cell Stretch Mechanosensing
Benjamin Plambeck1,2, Eunji Kim1, and Jung Yul Lim1
University of Nebraska-Lincoln, Lincoln, NE

SAT-353 A Novel Graphical Method to Optimizing Incubation Time in Immunoassays
Aaron Sawbel1, Rebecca Ulrich von Berger1, and Matthias U. Nolten1
University of Oklahoma, Norman, OK, Immunomycologics, Norman, OK

SAT-356 Assessing Intestinal Organoids Drug Response in a Well-defined Synthetic Basement Membrane Microenvironment
Kara Leard1, Aynola Lampaija1, Victor Hernandez-Gordillo1, Linda Griffiths1
Massachusetts Institute of Technology, Cambridge, MA

SAT-357 Graded Control of Myosin Light Chain Phosphorylation to Quantitatively Study Mechanobiology
Kristen Fetah1, Jasmine Hughes12, and Sanjay Kuma1
University of California Berkeley, Berkeley, CA, UC Berkeley UCSF Graduate Program in Bioengineering, Berkeley, CA

SAT-358 Environmental Influence on Cellular Uptake in Micro-scaled Cell Models
Kenda Harrison1, Dave Judge1, Hunter Peterson1, and Kunze Anja1
University of Minnesota, Minneapolis, MN

SAT-359 Engineering Artificial Cells as Biosensors in a Biofilm Environment
Michelle Mi1, Yufang Ding1, Luis Eduardo Contreras Llanes1, and Cheemeng Tan1
University of California, Davis, CA

SAT-360 Role of Ap-32 in Fibrinogen Binding and Distribution in Platelets
Nicole Laschober1, Anachaa Mitrgun2, Anh Ngo1, and Louis Cardon1
Oregon Health and Science University, Portland, OR, Oregon State University, Corvallis, OR

SAT-361 Disrupting Mutant K-Ras Gene with High Specificity By CRISPR/Cas9
Thomas Ethridge1, Clairean M. Lee1, Anirban Ray2, and Gang Bao1
Georgia Institute of Technology, Atlanta, GA

SAT-362 Site-directed Mutagenesis of Nilotinib to Enhance Efficacy Against Heterogeneous AML Cell Lines
Kendra Hergett1, Derek Judge1, Hunter Peterson1, and Kunze Anja1
University of Minnesota, Minneapolis, MN

SAT-363 Discriminating the Impact of Notch Signaling on Lipid Metabolism in HepG2 Cells
Tip Sripakananan1,2, Barbara Tervukka1, and Douglas Lauffenburger1
Washington University in St. Louis, St. Louis, MO, 2University of Maryland, College Park, MD

SAT-364 The Role of RO5048981 in Spinal Infection: An in Vitro and in Vivo Study
Christopher Lee1,2, and Alexander J. Iscenko1
University of California, Davis, Davis, CA

SAT-365 The Role of RhA/Rock Pathway in the Mechanotransduction of Pre-adipocytes: An Inhibitor Study Using Rock Inhibitor Y27632
Sophia Gyszyk1, Neeraj Varma1, and Jonathan Sachs1
University of Minnesota, Minneapolis, MN

SAT-366 The Role of RhoA/Rock Pathway in the Mechanotransduction of Pre-adipocytes: An Inhibitor Study Using Rock Inhibitor Y27632
Sophia Gyszyk1, Neeraj Varma1, and Jonathan Sachs1
University of Minnesota, Minneapolis, MN

SAT-367 Investigating the Possibility of Dimerization of the FAS Transmembrane Domain and Effects in Signal Transduction
Sophia Gyszyk1, Neeraj Varma1, and Jonathan Sachs1
University of Minnesota, Minneapolis, MN

SAT-368 Physical Regulation of Cell Adhesion Strength by Cell-Surface Bound Polymers
Brianna Knecht1, Patrick Cheng1, and Jared Farley1
Georgia Institute of Technology, Atlanta, GA

SAT-369 Physical Regulation of Cell Adhesion Strength by Cell-Surface Bound Polymers
Brianna Knecht1, Patrick Cheng1, and Jared Farley1
Georgia Institute of Technology, Atlanta, GA

SAT-370 Characterization of NRF2–JUND–p53 Regulatory Network In Breast Epithelia
Joleen Cheah1,2, and Soichiro Yamada1
University of California, Davis, Davis, CA

SAT-371 The Impact of Vascular Ehlers-Danlos Syndrome Mutations on Integrin-to-Collagen III Binding
H. Rose Warren1, Alyssa Kemig1, Madison Godsewski1, Janet Baum1, and David Sheshe1
University of Vermont, Charlottesville, VA, Rutgers, The State University of New Jersey, New Brunswick, NJ

SAT-372 Role of Nanoparticles’ Surface Coating Mechanics In Cellular Uptake
Nicole Laschober1,2, Annachiara Mitrugno1, Anh Ngo1, and Louis Cardon1
Oregon Health and Science University, Portland, OR, Oregon State University, Corvallis, OR

SAT-373 Downregulation of CXCR1 and CXCR2 on Human Neutrophils in Extracellular Recirculation Through Fibers with Immunoblotting IL-8
Bianca N. Dar1, Alexander D. Mallin1, William J. Federupinski1, John A. Kellum1, and Kai Singbartl1
University of Pittsburgh, Pittsburgh, PA, Mayo Clinic, Phoenix, AZ

SAT-374 Downregulation of CXCR1 and CXCR2 on Human Neutrophils in Extracellular Recirculation Through Fibers with Immunoblotting IL-8
Bianca N. Dar1, Alexander D. Mallin1, William J. Federupinski1, John A. Kellum1, and Kai Singbartl1
University of Pittsburgh, Pittsburgh, PA, Mayo Clinic, Phoenix, AZ

SAT-375 Inhibiting ‘Self’ Signaling & Promotes Solid Tumor Clearance
Brandon Heyer1, Garry Alexy1, Jerome Itzkof1, and Dennis Drischer1
University of Pennsylvania, Philadelphia, PA

SAT-376 Inhibiting ‘Self’ Signaling & Promotes Solid Tumor Clearance
Brandon Heyer1, Garry Alexy1, Jerome Itzkof1, and Dennis Drischer1
University of Pennsylvania, Philadelphia, PA

SAT-377 IRP2 Immobilization Inhibits ‘Self’ Signaling & Promotes Solid Tumor Clearance
Brandon Heyer1, Garry Alexy1, Jerome Itzkof1, and Dennis Drischer1
University of Pennsylvania, Philadelphia, PA

SAT-378 IRP2 Immobilization Inhibits ‘Self’ Signaling & Promotes Solid Tumor Clearance
Brandon Heyer1, Garry Alexy1, Jerome Itzkof1, and Dennis Drischer1
University of Pennsylvania, Philadelphia, PA

SAT-379 IRP2 Immobilization Inhibits ‘Self’ Signaling & Promotes Solid Tumor Clearance
Brandon Heyer1, Garry Alexy1, Jerome Itzkof1, and Dennis Drischer1
University of Pennsylvania, Philadelphia, PA

SAT-380 IRP2 Immobilization Inhibits ‘Self’ Signaling & Promotes Solid Tumor Clearance
Brandon Heyer1, Garry Alexy1, Jerome Itzkof1, and Dennis Drischer1
University of Pennsylvania, Philadelphia, PA

SAT-381 IRP2 Immobilization Inhibits ‘Self’ Signaling & Promotes Solid Tumor Clearance
Brandon Heyer1, Garry Alexy1, Jerome Itzkof1, and Dennis Drischer1
University of Pennsylvania, Philadelphia, PA

SAT-382 IRP2 Immobilization Inhibits ‘Self’ Signaling & Promotes Solid Tumor Clearance
Brandon Heyer1, Garry Alexy1, Jerome Itzkof1, and Dennis Drischer1
University of Pennsylvania, Philadelphia, PA

SAT-383 IRP2 Immobilization Inhibits ‘Self’ Signaling & Promotes Solid Tumor Clearance
Brandon Heyer1, Garry Alexy1, Jerome Itzkof1, and Dennis Drischer1
University of Pennsylvania, Philadelphia, PA

SAT-384 IRP2 Immobilization Inhibits ‘Self’ Signaling & Promotes Solid Tumor Clearance
Brandon Heyer1, Garry Alexy1, Jerome Itzkof1, and Dennis Drischer1
University of Pennsylvania, Philadelphia, PA

SAT-385 IRP2 Immobilization Inhibits ‘Self’ Signaling & Promotes Solid Tumor Clearance
Brandon Heyer1, Garry Alexy1, Jerome Itzkof1, and Dennis Drischer1
University of Pennsylvania, Philadelphia, PA

SAT-386 IRP2 Immobilization Inhibits ‘Self’ Signaling & Promotes Solid Tumor Clearance
Brandon Heyer1, Garry Alexy1, Jerome Itzkof1, and Dennis Drischer1
University of Pennsylvania, Philadelphia, PA

SAT-387 IRP2 Immobilization Inhibits ‘Self’ Signaling & Promotes Solid Tumor Clearance
Brandon Heyer1, Garry Alexy1, Jerome Itzkof1, and Dennis Drischer1
University of Pennsylvania, Philadelphia, PA
SAT-362 Role of Protease-Activated Receptor 4 in Regulating Platelet Dense Granule Release
Tiffany Chu, Rachael Rogg, Laura Hawryl, Ani Ng, Anamika Maitra, Joseph Aslan, András Gruber, Craig Lindsley, Matthew Duverney, Heidi Hann, and Owen McCarty
Johns Hopkins University, Bel, Iowa Care, Dana Chang, Gabrielle Goen, Adam Bumsby, Jason Lohrmuller, Natacha Makan-Dawson, Sarah Robinson, Carinina Nave, and Alex Dasher
University of Pittsburgh, Pittsburgh, PA, Carnegie Mellon University, Pittsburgh, PA

SAT-363 Wnt Signaling Modulation & -Syrineculin Aggregation in Syringeinopathies
Viral Gos, Jeye Hyon Park, and Pamela McLean
University of Illinois at Urbana-Champaign, Bloomington, IL, Mayo Clinic, Jacksonville, FL

SAT-364 Optical Control of Escherichia Coli Chemotaxis using the Photoswitchable Protein Dronpia
Vivian Hu, William McIntyre, Sarah Lefkowitz, Daniel Chang, Gabrielle Goen, Adam Bumsby, Jason Lohrmuller, Natacha Makan-Dawson, Sarah Robinson, Carinina Nave, and Alex Dasher
University of Pittsburgh, Pittsburgh, PA, Carnegie Mellon University, Pittsburgh, PA

SAT-365 The Role of Post-Translation Modifications on Chemokine Receptor CXXC4 Trafficking Through Clathrin-Coated Pits
Yanm Herrera, Luciana Kaiser Roselló, and Allan Liu
University of Michigan, Ann Arbor, MI

SAT-366 tnfα Increases Isometric Force in Intact Airway Smooth Muscle
Sara Oram, Mural Daghe, Young Han, Philippe Duvimolte, and Gary Siesk
Mayo Clinic, Rochester, MN

SAT-368 The Effect of Sweeteners on Wound Healing
Agni Abdoolah, Sofia Castro-Pedrido, and Ronke Olabisi
University of Pittsburgh, Pittsburgh, PA, National University of Singapore, Singapore, Singapore

SAT-369 Test Bed Development for Adaptive Control of Biological Systems Using Iterative Learning
Adam Terwilliger, Christopher Pisto, Jerome McEleney, and Jordan Gilmore
The Citadel, Military College of South Carolina, Charleston, SC, Clemson University, Clemson, SC

SAT-370 Optimizing a Dihydroartemisinin Assay for the Detection of Substandard Medicines
Alana Gonzales, Andrew J. Avedesian, and Muhammad H. Zaman
The University of Arizona, Tucson, AZ, Boston University, Boston, MA

SAT-371 Smart Phone-Based Quantification Method for Assessing Sickle Cell Disease Severity
Alex Jolly, Kevin Cyr, Jennifer Colby, and Christina Marasco
Vanderbilt University, Nashville, TN

SAT-372 Reflectance-Based Metabolic Sensor
Amaury Perea, Jonathan Shmueli, and Chinny Marasco
Vanderbilt University, Nashville, TN

SAT-373 Design of “Digital Extenders” Platform for Augmented Digital Intubation
Andrea Almeida, Taiyo Katsuda, Sarah Robinson, Corinna Nave, and R. Lyle Hood
University of Texas at San Antonio, San Antonio, TX

SAT-374 Characterizing Flow Rates in Nitrocellulose For Multistep Assays
Anna Erz, Kristen Ryan, and Jacqueline Limnes
Purdue University, West Lafayette, IN

SAT-375 Non-invasive Skin Patch Sensor to Detect Lower-lim Fluid Volume Shift after Simulated Microgravity
Brandon Eckerman, Jacob Grifith, Ryan Becker, and Kim Cluff
Wichita State University, Wichita, KS

SAT-376 Improving Robotic Surgery Training with Bimanual Wrist Squeezing Haptic Feedback
Zachary Penner, Erik Tarr, Sundeep Rana, and Neil Mehta
University of Pittsburgh, Pittsburgh, PA, Johns Hopkins University, Baltimore, MD

SAT-377 Parameter Optimization for the Detection of Nucleotides using Electrochemical Impedance Spectroscopy
Caroline Ledig, John, and Jeffrey Halpern
University of New Hampshire, Durham, NH

SAT-378 Emergency Rapid Injection Device
Zachary Thome, Pamela Johnson, Rebecca Osbome, Katherine Solly, Fatima Rezai, Kevin Grinn, Eric Kennedy, and Daniel Cavanagh
Bucknell University, Lewisburg, PA, Geisinger Health System, Danville, PA

SAT-367 Continued Development of a Solution to Epidermal Catheter Dislocation
Hannah Tickets and Daniel Cavanaigh
University of Louisville, Louisville, KY

SAT-379 Development Toward a Tear Lactate Sensor Employing an Engineered Lactate Oxidase
Daniel Cavanaigh, Jingjing Liu, Chinti Li, Jiankui Hu, Kaye Soder, and Jeffrey Leland
Arizona State University, Tempe, AZ, Tokyo University of Agricultural Technology, Tokyo, Japan

SAT-380 Impedance Sensors for Early Bacterial Biofilm Detection and Treatment Assessment in Medical Implants
Dennis Roukewitch, Erikken Golkoottsewa, Jordan Green, Hans Steenackers, and Dries Braeken
Johns Hopkins University, Baltimore, MD, WEC, Leuven, Belgium, Katholieke Universiteit Leuven, Leuven, Belgium

SAT-382 Characterization of a Custom-Bult, Open-source Microcam Bioreactor for Testing Glisone Response
Eric Dubofsky and John Schwing
California Polytechnic State University, San Luis Obispo, CA, Rutgers University, Piscataway, NJ

SAT-383 A Clinically Translatable Syringe Adaptor for Delivering Biomaterial in Spatially Controlled Patterns for Spinal Cord Injury
Gaya Karunakunda, Eric Krytsak, and Michael Detamore
University of Colorado Boulder, Boulder, CO, University of Oklahoma, Norman, OK

SAT-384 Four-Pont Fortune-Teller-Inspired Origami Grasper for Increased Dexterity and Less Tissue Damage in Minimally Invasive Surgery
Haesoon Lee, Bok Seng Yeo, and Hongliang Ren
University of Pittsburgh, Pittsburgh, PA, National University of Singapore, Singapore, Singapore

SAT-385 Pressure Mapping Prosthetic Socket Using Textile Force Sensors
Harrison Eggen, Jonathan Fu, William Kii, Luke Osbourn, and Neel Thakkar
Johns Hopkins University, Baltimore, MD, National University of Singapore, Singapore, Singapore

SAT-386 Preliminary Development of A Low-Cost Flexible Endoscope for Robotic Minimal Invasive Nasopharyngoscopy
Jacob Meadows, Bok Seng Yeo, and Hongliang Ren
University of Pittsburgh, Pittsburgh, PA, National University of Singapore, Singapore, Singapore

SAT-388 Rapid Prototyping of a Novel Device for Treatment Of Colorectal Anostomotic Leak
Jaana LaColla, Andrew Rissi, Rachel Slappey, and Elizabeth Barker
University of Tennessee, Knoxville, TN, University of Tennessee Medical Center, Knoxville, TN

SAT-389 Rapid Fabrication and Characterization of Pediatric Nitric Oxide (NO) Releasing Catheter
Igor Panchenkov, Manju Yang, and Kazya Amoako
University of New Haven, West Haven, CT

SAT-390 A Portable, Low-Cost Imaging System to Study Long-Term Live Cell Fluorescent Dynamics
Conner Beil, Clark Hickman, Hunter Peterson, and Kuzma Anja
Montana State University, Bozeman, MT, Gustavia Adolphi College, St. Peter, MN

SAT-391 Faradic Assessment of IGF-1 interference on Insulin to Further the Development of a Point-of-Care Insulin Sensor
Mukund Khawashe, Connor Beil, Alkin Maksic, David Probst, Chinti Li, Jeffrey Leland, and Curtis Cook
Arizona State University, Tempe, AZ, Mayo Clinic Arizona, Scottsdale, AZ

SAT-392 Wearable Sensor Network Monitors Tibial Loading During Athletic Activity
Navin Bali, Jonathan Ehman, and Christina Marasco
Vanderbilt University, Nashville, TN

SAT-393 BioZ Sense: Evaluating Biomepndance for Non-invasive Lifestyle Activity Monitoring
Nikita Tumarapudi
University of Illinois at Urbana-Champaign, Bridgewater, NJ

SAT-394 Texture Simulation with One Degree of Freedom Normal to the Surface using a Loudspeaker
Oliver Snyder, George Sterben, and Robert Stalske
University of Pittsburgh, Pittsburgh, PA, Carnegie Mellon University, Pittsburgh, PA

SAT-395 A Device for Preloded, Tri-Folded Grafts to Facilitate Descemet’s Membrane Endothelial Keratoplasty
Parth Vora, Eric Chiang, Stephanie Cai, Kari Barnes, Ronen Chen, Anand Subramanian, Alex Chevalier, Allison Rosen, Amir Manbachi, and Robert Aller
Johns Hopkins University, Baltimore, MD
SAT-396  Rapid Prototyping of a Novel Fistula Treatment Device
Rachel Slepyj1, Drew Rust1, Jennie LaCollie2, and Elizabeth Barker1
1University of Tennessee, Knoxville, TN, 2University of Tennessee Medical Center, Knoxville, TN

SAT-397  A Haptic Video Game Designed to Study How Sensory Feedback Resilience to Overload Affects Mental Workload as Measured by Electrodermal Activity (EDA)
Holoman Hemmerling1, Mitchell Young1, Morgan Manske1, Isaac Maas1, and Reva Johnson1
1Valparaiso University, Valparaiso, IN

SAT-400  Modular Steering and Force Sensing Soft Robotic Actuator
Rudy Montagre1, Austin Taylor1, Zion Tse1, and Zhuo Zhao1
1University of Georgia, Athens, GA

SAT-401  Softening Spinal Cord Stimulator: Evaluation of Chronic Neural Interface
Rudy Montagre1, Tell Lovelace1, and Ellen Gawalek1
1Texas A&M University, College Station, TX

SAT-404  Soil Mobility of Tobacco Mild Green Mosaic Virus for the Delivery of Pesticides to Plant Parasitic Nematodes.
Paul Chapon1, Alan Ogden2, and Nicole Steigmier1
1Case Western Reserve University, Cleveland, OH

SAT-405  X-ray Activatable Drug Release of Hybrid Gold Polymersomes for Cancer Chemoradiotherapy
Alexander Chan1, Zijian Zhu1, and Xiaoyan Chen1
1The National Institutes of Health, Bethesda, MD, 2The Pennsylvania State University, University Park, PA

SAT-406  The Efficacy of a Novel Nanoparticle as a Delivery Vector for Exogenous mi-7 to Cells In Vitro
Amanda Solbach1, Michael Holloway2, David Devone1, and Charles Robb1
1Texas A&M University, San Antonio, San Antonio, TX, 2Rutgers, The State University of New Jersey, Piscataway, NJ

SAT-407  Localized Drug Delivery of Aspirin to Stent Sites Via Self Assembled Monolayers
Angelo Milusko1, Tell Lovelace1, and Ellen Gawalek1
1Duquesne University, Pittsburgh, PA, 2McGowan Institute of Regenerative Medicine, Pittsburgh, PA

SAT-409  Exosomes: A Potential Therapeutic Delivery Device for Multiple Sclerosis (MS)
Ashley Tucker1, Megha Bilajwala1, Colin Young1, and Jane Welsh1
1Texas A&M University, College Station, TX

SAT-410  Constant Pressure Controlled Infusions in Agarose Gels
Estrada Montano1, Elyse Elenora1, and Christopher Rylander1
1University of Texas at El Paso, El Paso, TX, 2The University of Texas at Austin, Austin, TX

SAT-411  Dissolvable Microneedles for Inhibition of Angiogenesis
Brandon Davis1, David Kaufman1, James Coyle1, and Yong Wang1
1The Pennsylvania State University, State College, PA

SAT-412  Effect of Molecular Weight on Ultrasonoud-Targeted Drug Delivery
Danny P. Bhumit1, Emily M. Murphy1, Mariah C. Priddy1, Connor C. Centner1, Joseph B. Moore IV1, Roberto Bull1, and Jonathan A. Kopechek1
1University of Louisville, Louisville, KY

SAT-413  Sustained Release of Protein Drugs from Polymeric Microneedles for Immunotherapy
David Kauffman1, Brandon Davis1, James Coyle1, and Yong Wang1
1Texas A&M University, College Station, TX

SAT-414  In Situ Collagen Crosslinking to Improve Tendon Strength After Tears
Dominic Kiehl1, Edgaro Rivera-Delgado1, Tejas Kashyap1, Greg Levent1, and Haroon von Reutern1
1Case Western Reserve University, Cleveland, OH

SAT-415  Optimization of the Synthesis of Multi-Stage Albumin Nanoparticles for Drug Delivery
Elena Helito1, Jae You Kim1, and Debakshya Ghosh1
1Smith College, Northampton, MA, 2The University of Texas at Austin, Austin, TX

SAT-416  In Vitro Characterization of Melatonin-Loaded Conducting Polymer Coatings for Neural Electrodes
Evia Schuch1, Akshay Golabchi1, Kevin Wongpatt1, Ian Taylor1, and X. Tracy Cui1
1University of Pittsburgh, Pittsburgh, PA

SAT-417  Targeted Delivery of Chemotherapeutics to Human Cancer Cells with Aptamer-conjugated Nanoemulsions
Emily M. Murphy1, Daniel A. Hodge1, Paula J. Bates1, Mohammad T. Malik1, and Jonathan A. Kopechek1
1University of Kentucky, Lexington, KY

SAT-419  Inertial Microfluidic Intracellular Macromolecule Delivery
Emily Macrini1, Yanzang Deng1, and Aram Chung1
1University of Buffalo, Buffalo, NY, 2Rensselaer Polytechnic Institute, Troy, NY

SAT-420  Novel Nanoparticle Growth Factor Delivery System Promotes Cell Proliferation In Vitro Novel Growth Factor Delivery System Promotes Cell Proliferation In Vitro
Eri Sinha1, Jessica Underlinger1, Cassandra Callmann1, Nathan Gasman1, and Karen Christianson1
1University of California, San Diego, La Jolla, CA, 2Northwestern University, Evanston, IL

SAT-421  Polymeric Microneedle Patch Loaded with PLA-Curcumin Microspheres
John Molinski1, Khashi Tran1, and Thanh Nguyen1
1University of Massachusetts Dartmouth, Dartmouth, MA, 2University of Connecticut, Storrs, CT

SAT-422  Microrobotic Optical Resonators as a Novel Platform for Selective Drug Detection
Kara Roberts1, Errol Otug2, and Judith Su1
1University of Arizona, Tucson, AZ

SAT-423  Analysis of Nanoparticle Adhesion Under Flow
Kathleen Lutz1, Kelly Langert2, and Eric Bray3
1University of Arkansas, Fayetteville, AR, 2Illinois Institute of Technology, Chicago, IL

SAT-424  Development of Tissue Mimic Models to Study Free Radical-Initiated Polymer Immobilization
Kase K. Kim1, Christopher A. Lowy1, and David K. Sherman1
1Rutgers, The State University of New Jersey, Piscataway, NJ

SAT-425  A Biodegradable Multidrug Delivery System for Post-Operative Ocular Management
Kush Patel1 and Masaar Mohamed1
1Johns Hopkins University, Baltimore, MD

SAT-426  A Biomimetic Microfluidic Platform for Anti-Tumor Drug Evaluation
Lara Reid1, Wentao Shi1, and Yaling Lu1
1Lehigh University, Bethlehem, PA

SAT-427  Localized Immunosuppression Therapy for Islet Cell Encapsulation
Madeline M. Laughrin1, Graceline Hernandez1, and Sherry Harbin1
1Purdue University, West Lafayette, IN

SAT-429  Investigating Chemical Compound Modulators against Vibrio Cholerae’s Phosphotransferase System
Mahatb Wasseem1 and Patrick Ymele-Lek1
1Howard University, NW DC

SAT-430  Enzymatic Activation of Prodrugs for Targeted Drug Delivery
Meghan Hill1, Mendl Marquez1, Ullya Frilove1, and Michaelartins Tarte1
1Nanowire Institute of Nanotechnology and Sorbonne, CNRS

SAT-431  Elucidating the Roles of Extracellular Vesicle-Associated Long Noncoding RNAs in Breast Cancer
Natalie Livingston1, Tek Lenchik1, and Steven Jay1
1University of Maryland, College Park, MD

SAT-432  Assay Characterizing Mechanical Properties of Long-Acting Implant Seals
Phillip Chung1, Solange Simpson1, Lakmim Wisanapanth1, Samuel Sung1, and Patrick Kiser1
1Northwestern University, Evanston, IL

SAT-433  The Effect of Pig Lung Extracellular Matrix Nanoparticles on Macrophage Phenotypes
Alexandra Ritchie1, Gabrielle Cotman1, Michael Valentine1, Patrick Link1, and Rebecca Heave1
1Virginia Commonwealth University, Richmond, VA

SAT-434  Tuning Size and Charge of a Multivalent Polymer Library for Enhanced Drug Delivery to Cartilage
Sahwan Butrani1, Brett Geiger1, Alan Grodinshki1, and Paula Hammond1
1University of Michigan, Ann Arbor, MI, 2Massachusetts Institute of Technology, Cambridge, MA

SAT-435  Self-assembling Nanomaterials for Local Delivery of Anti-inflammatory Drugs in Cell Transplantation
Teresa De Tore1, Dana Veile1, and Alice A. Toma1
1University of Padova, IT; Padova, Italy, 2University of Miami, Miller School of Medicine – USA, Miami, FL, 3University of Miami – USA, Miami, FL

SAT-436  A Biodegradable Nanoparticle System for the Drug Delivery of Tumor Necrosis Factor-Related Apoptosis Inducing Ligand
Kush Patel1, and Masaar Mohamed1
1Johns Hopkins University, Baltimore, MD
SAT-436  Heparin/Poly-L-lysine Adhered on 3D-Printed PLGA Scaffold as Drug Carriers for Local Immune Modulation in Bone Regeneration
Tony Nguyen
Columbia University, New York, NY

SAT-438  Native Free Radical Mediated Crosslinking of Functionalized PEGs as a Targeted Delivery Mechanism
Victor Manuel Suarez1, Keana R. Mirmajlesi2, Christopher J. Lowe, and David I. Shreiber
Kansas University, Union, NJ, Rutgers, The State University of New Jersey, Piscataway, NJ

Track: Undergraduate Research, Design & Leadership, Nano and Micro Technologies

SAT-439  In Cell Western Blotting for Quantifying Protein Expression in 3D Tumor-Stroma Microfluidic Device
Alexander Kratz1, Dash Truong1, Toan Nguyen1, and Mehdi Nikbakht1
Arizona State University, Tempe, AZ

SAT-440  Hydrogel Microdomain Encapsulation of 4-Mercapto-Succinic Acid-Deulin Serum Albumin for SERS pH and Urea Sensing
Alexander Quinn1, Yi-Huei You1, and Michael McClure1
Texas A&M, College Station, TX

SAT-441  Microrobotic Magnetic Cell Sorter for Breast Cancer Circulating Tumor Cells
Bryana Harris1, Ying Liu1, Yijin Zhou1, and Leisong Mao1
Auburn University, Montgomery, AL

SAT-442  Colistin Functionalization of Carbonylated Nanoparticles
Candice Graham1, Stephen Petty Valenzuela1, Smead Miller1, Charlesea Bell1, and Todd Georgi1
Vanderbilt University, Nashville, TN

SAT-443  Adapting the MiniON Nanopore Platform to Measure the Single-Molecule Movements of a Superhelical
Daniel Huang1, Dmitry Bobrovnikov1, and Taejoon Ha2
Johns Hopkins University, Hudson, OH, Johns Hopkins University, Baltimore, MD

SAT-444  Design and Synthesis of Nanopore Loaded Nanofiber for Localized Detoxification
David Cadene1, Hao Zhuang1, Oliver Zhang1, Yue Zhang2, and Lujinghe Zhang2
University of Texas at San Antonio, San Antonio, TX, Tsinghua University, Beijing, China, People's Republic of, University of California at San Diego, San Diego, CA

David Magnoni1, Christian Shirotani1, and Adam Abate1
University of California, Davis, CA, University of California, San Francisco, San Francisco, CA

SAT-446  Analyzing the Chemical and Physical Properties of Bone Serum Albumin and Ceteum Oxide Nanoparticles Using a Nanopore Sensor
David Mai1, Sam Bearden1, and Guigen Zhang1
University of California, Berkeley, Berkeley, CA, University of California, Berkeley, CA

SAT-447  Viscous Fingerings and Lateral Flow Parameters in Rapid Salivary Testing Applications
Devon Rusk1, Pierce Leikam1, and Holly Clingan1
University of Colorado, Boulder, Boulder, CO

SAT-448  Horseradish Peroxidase (HRP)-mediated Silver Precipitation for Vascular Endothelial Growth Factor (VEGF) Quantification
Dina Shohat1, Joshua Kerfer1, and Gangi Ghosh1
University of Michigan, Dearborn, MI

SAT-449  Comparative Deformability and Microfluidic Perfusion of Human and Nonhuman Red Blood Cells
Pranav Murugan1, Madeleine Lu1, Esther Vors1, and Sergeya Shvokypai1
University of Houston, Houston, TX

SAT-450  NanoCluster Beacons using NGS Platform
Guillermo Beckmann1, Yu-Ju Chen1, and Tim Yeh1
University of Texas at El Paso, El Paso, TX, University of Texas at Austin, Austin, TX

SAT-451  DNA Constructions: A High Throughput Microfluidic Assay for Visualizing DNA Holiday Junctions
Hillian Kuo1,2 and Si Redding1
UC Berkeley, Berkeley, CA, UC, San Francisco, San Francisco, CA

SAT-452  Development of Flexible pH Sensors Based on Electrodeposited IrOx Thin Films
Lillian Tsh1, Isaac Clark1, Paul Marini1, Wyatt Moore2, and Hung Cao2
University of Washington, Seattle, WA, University of Washington, Bothell, WA

SAT-453  Development of Mn3C:Dot Based T1 MRI Contrast Agents
Jesica Alomia1, Daje Lee1, and Jin Xue1
Wichita State University, Wichita, KS, University of Georgia, Athens, GA

SAT-454  A Novel Enzyme Linked Immunosorbent Assay for Magnetic Capture of the Interleukin-6 Biomarker
Jorge Figueroa1, Elena Yarmola1, and Kyle Allen1
University of Florida, Gainesville, FL

SAT-455  Development of an Assay for Detecting an Oral Cancer Biomarker Using Surface Enhanced Raman Spectroscopy (SERS)
Luke Oski1, Sungyol Ha2, Andrea Loeska1, Yi-Shing Lisa Chang1, and Gerard Cote1
Texas A&M University, College Station, TX, Texas A&M Engineering Experiment Station, College Station, TX, Texas A&M University, Dallas, TX

SAT-456  Immunohistological Image Analysis of Microprobe Array Targeting Hippocampus
Katarina Cuadros1, Anahita Neillman1, Huajing Fu1, Kee Scholtz1, Doming Song1, and Ellis Meng1
University of Southern California, Los Angeles, CA, University of Southern California, Los Angeles, CA

SAT-457  Oriented Immobilization of Antibodies Through Reconstitut Protein-G on Assembled Gold Nanorods for Label-Free Biosensing Applications
Marcelo Vital1, Victor Agapiero1, and Liang Tang1
The University of Texas at San Antonio, San Antonio, TX

SAT-458  Nanoshells Targeting EGFR Enhance the Sensitivity of ELISA-Based Detection Methods
Matthew Smanik1, Rachel Noyce1, and Emily Day1
University of Delaware, Newark, DE

SAT-459  Hydrophobic Porous Si Based Photonic Crystals for the Detection of Ethanol During Fermentation
Mikaela Libby1, Hunter Pauker2, Sasikumar Jayaraman1, and Paul Pfeiffer1
University of California Davis, Davis, CA, UNAM, Guanajuato, Mexico, University of California San Diego, La Jolla, CA

SAT-460  Temperature Rise of Nanoparticle Doped Silicon with a Perfused Phantom
Naeicy Atay1, Ryan Packard1, Nicole Levy-Polyschenko1, and Frances Gayk1
Wake Forest University, Winston-Salem, NC, Wake Forest Baptist Health, Winston-Salem, NC

SAT-461  Subordinate Oscillator Array Design for Ultrasonic Mass Detection
Noah Sonne1, John Sterling1, Aileo Glaes2, Joseph Vigolino1, and Terence Ryla1
University of California, Greenville, NC, University of California, Berkeley, CA

SAT-462  A Novel Microfluidic Nano-Carrier for Analysis of Growth and Stiffness of Cancer Spheroids Using 3D-Printed Microactuator Device
Norah Coyle1, Davina Jason1, Alexander Almeida1, Zichao Bian1, Kevin Case1, Kauky Wootton1, and Kazunori Hoshino1
University of Connecticut, Storrs, CT, University of Connecticut Health Ctr, Farmington, CT

SAT-463  Raman Spectroscopy and Transmission Electron Microscopy of SixGe1-x-Ge-Si Core-Shell Nanowires
Paola Perez1, Yang Wei1, and Emanuel Tutu1
University of Texas at El Paso, El Paso, TX, University of Texas at Austin, Austin, TX

SAT-464  Single-CeI, Single-Molecule Analysis of tnf-alpha Signaling with Quantum Dots
Prabhas Moghe1, Oussama Bahaa1, and Alexander Smith1
Case Western Reserve University, Cleveland, OH, University of Illinois at Urbana-Champaign, Champaign, IL

SAT-465  Analysis of Particle Collection Methods Using Magnetic Capture in Rat Osteoarthritic Models
Samuel Arment1, Elena Yarmola1, Rasheda Shah1, Brittan Perry1, and Kyle Allen1
University of Florida, Gainesville, FL

SAT-466  Optimization of Polyethylene-Coated Rare Earth Nanoparticle Biocompatibility in Vitro
Sandra Mcloughlin1, Janika Suvarespatikul1, Robin Ramsay2, Vishal Garg1, Prabhas Moghe1, and Mitch Chee Tan1
Rutgers, The State University of New Jersey, Piscataway, NJ, Singapore University of Technology and Design, Singapore, Singapore

SAT-467  Cell-laden Hydrogel Microspheres Using 3D Printed Microfluidics
Shannon McLoughlin1, Janika Suvarespatikul1, Robin Ramsay2, Stephen Sawyer1, and Prabhas Moghe1
Singapore University of Technology and Design, Singapore, Singapore

SAT-468  Microfluidic Assay of Whole-cell And Nuclear Deformability Using Single-cell Physical and Fluorescent Phenotyping
Tobbi Baweja1, Jonathan Lin1, Lilian Peng1, Bonnie Yeh2, and Dino Di Carlo3
University of California Los Angeles, Los Angeles, CA

SAT-469  BBB-on-Chip: Optimizing BB Culture for Microfluidic Modeling of the NVU
Victoria Harbort1, Brinon Phang1, Roy Samuel1, Josovin Dal1, Tarun Masimukku1, and Sagnik Basuray1
New Jersey Medical School, Newark, NJ
SAT-470 A 3D Printed, Low Cost, High Capacity Bubble Trap for Microfluidic Applications
Cristian Almandaraz1, Mohammad Razai Hasan1, and Vinay Abhyankar1
1UT-Arlington Research Institute, Fort Worth, TX, 2Rochester Institute of Technology, Rochester, NY

SAT-471 Density of Influence on Silica Nanoparticle Toxicity
Zachary Zerba1
1University of Utah, Salt Lake City, UT

SAT-472 Undergraduate Research, Design & Leadership, Neural Engineering
Neural Engineering-Undergraduate

SAT-473 MEG Signal Classification as a Model Free Assessment of Hemispheric Language Dominance: Proof of Principal and Preliminary Evidence
Aditya Singh1, Mark McMains1, Fred Perkins1, Dave Clarke1, and Paul Ferrara1
1University of Texas at Austin, Austin, TX, 2The Children’s Medical Center of Central Texas, Austin, TX, 3UT Medical School/UT Austin, TX

SAT-474 Multielectrode Cortical Stimulation Selectively Activates Excitatory Neurons
Alica Heiner1, Susan Komaromi1, and Maxam Babashoff1
1University of California, San Diego, CA

SAT-475 Characteristic Spike-and-Wave Discharges Link Dys tonic Attack Progression and Absence Seizures in EA2 Mouse Model Tottering
Anet Nark1, Russel Carter1, and Timothy Ebner1
1Case Western Reserve University, Cleveland, OH, 2Louis Stokes Cleveland Department of Medical Sciences, Cleveland, OH

SAT-476 MMP-1 Exposure Increases Neuronal Activity In Vitro
Olivia Leaunt1, Meagan Ita1, and Beth Winkelstein1
1Wake Forest University, Winston-Salem, NC

SAT-477 Nonlinear Analysis of Pre- and Post-ictal Brain States Using Cross-frequency Phase-Amplitude Coupling
Christopher Mondragon1, Diana Escalona-Vargas1, Aaron S. Kemp1, Leonidas Iasemidis1, and Linda Lemos-Prior1
1Louisiana Tech University, Ruston, LA, 2University of Arkansas for Medical Sciences, Little Rock, AR

SAT-478 Interface Design for Seizure Detection in Zebrafish Larvae
Cristhian Perez1, Thites Guimaraes Pedrão1, Marina Gonzalez1, Patricio Macabiau1, Claudia Mauren Moreira1, and Nathalia Peramoto1
1Georgia Mason University, Fairfax, VA, 2University of Campinas, Campinas, Brazil

SAT-479 Patterns of Motor Cortical Activity Described by the First Latent Dimension Predict Presence of an Object
Delaney Morale1, Anjelica Herrera1, John Dowsey1, and Jennifer Colligger1
1Middlebury College, Middlebury, VT, 2University of Pittsburgh, Pittsburgh, PA, 3Department of Veterans Affairs Medical Center, Pittsburgh, PA

SAT-480 Microfluidic Assay to Identify Neural Circuit Changes During Associative Learning
Dina Awad1, Daniel Lazzaro1, and Dick Abkowitz1
1University of California Berkeley, Irvine, CA, 2Worcester Polytechnic Institute, Worcester, MA

SAT-481 Developing a Retrograde Labeling Protocol in a Rat Sciatic Model to Measure Loss of Axonal Somatotopy Following Nerve Transsection
Emily Jackson1, Nikhil Chandna2,3,4,5, Manu Stephen2,3,4,5, Matthew MacEwan1, and Wilson Ray2
1Washington University, St. Louis, MO, 2University of Alabama, Birmingham, AL

SAT-482 Reaction Times to Intracortical Microstimulation in a Person with Tetraplegia are Similar to that of Peripheral Tactile and Visual Stimuli in Ablated Subjects
Gracie Browngett1, Jeffrey Weiss2,3, Robert Gaunt2,3, and Jennifer Colligger2,3
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SAT-483 Rest-State Cortical Network Differences Associated with First-Episode Schizophrenia-Psychosis Spectrum
Henry Phalen1, Brian Coffman1, Dean Salisbury2, and Erin Sejdic1
1University of Pittsburgh, Pittsburgh, PA, 2Louisiana Tech University, Ruston, LA, 3University of Alabama at Birmingham, Birmingham, AL

SAT-484 Oxidative Stress Following Intracortical Microelectrode Implantation
Jacob Rayyan1,2, Emelia Toth1,2, Diana Passoni1, Kristen Riley1, Roy Marin1, Leonidas Iasemidis1, and Sandipan Pathi1
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SAT-485 Impact of Brain Micro-Motion on Intracellular Membrane Potentials
Jonathan Duncan1, Sayyed Kumar1, Arati Snidhalakhar1, and Jianjun Zhang2,3
1Arizona State University, Scottsdale, AZ, 2Arizona State University, Tempe, AZ, 3University of Alabama, Tuscaloosa, AL

SAT-486 Interactions Between Waveform Shape and Visuomotor Response Properties in Prefrontal Cortex
Jonathan Scott1, Sanjeev Khanna1, and Matthew Smith1
1University of Pittsburgh, Pittsburgh, PA

SAT-487 Assessment of M-Phenylendiamine for Chronic Glutamate Microsensors
Katherine Skartvedi1, Prabhu Arunagam1, Shabnam Siddiqui1, and Shane Tan1
1Hendrix College, Conway, AR

SAT-488 Procedure for Measuring the Resistivity of the Epineurium Sheath Using Rat Sciatic Nerve
Kathleen Finer1, Prave Parth1, Elisa Wells1,7, Cynthia Cheesek1, John Seymour5, Scott Lempka1, and Tim Bruce1
1Hope College, Holland, MI, 2University of Michigan, Ann Arbor, MI, 3University of Florida, Gainesville, FL, 4University of Texas at Dallas, Dallas, TX, 5University of Illinois at Chicago, Chicago, IL

SAT-489 Functional Characterization of the Intercellular State and Its Impact on Cognition
Olivia Leaunt1, Emelia Toth1,2, Diana Passoni1, Kristen Riley1, Roy Marin1, Leonidas Iasemidis1, and Sandipan Pathi1
1University of Pittsburgh, Pittsburgh, PA, 2University of Alabama at Birmingham, Birmingham, AL

SAT-490 Evaluation of Electrophysiology from Implanted Intracortical Microelectrodes in Rat and Mouse Models
Kayan Chen1,2, Evon Ereifej1,2, John Herman1,3, Hillary Bedell1,4, Seth Meade1,2, Jacob Rayyan2,3,4, and Jeffrey Capadona1
1Case Western Reserve University, Cleveland, OH, 2Louis Stokes Cleveland Department of Veterans Affairs Medical Center, Cleveland, OH, 3University of Alabama at Birmingham, Birmingham, AL

SAT-491 Exploring Living Neural Network Activity via Multielectrode Array
Kyle Steadman1, Jakob Brandini1, Kara Smith1, Lauren Singelmann1, and Nolan Schwarz1
1North Dakota State University, Fargo, ND

SAT-492 Biological Signals Processing: Analyzing Neuronal Calcium Signals Using Continuous Wavelet Transform
Liming La5, Meng-Ming Chen1, Marie-Claude Perreault1,6, and Brandon LaPallo1
1The University of Texas at Austin, Austin, TX, 2University School of Medicine, Houston, TX, 3Georgia Institute of Technology, Atlanta, GA, 4University of Alabama at Birmingham, Birmingham, AL

SAT-493 Protocols for Assessing the Sensory Performance of Peripheral Nerve Macrosieves Interfaces
Luis Ruiz4, Jake Bergman1, John O’Malley4, Nikhil Chand1, Matthew Kewani2, and Wilson Rey2
1Washington University in St. Louis, St. Louis, MO, 2Christopher Newport University, Newport News, VA, 3University of Alabama, Tuscaloosa, AL, 4Washington University School of Medicine, St. Louis, MO

SAT-494 Development of Epilepsy-in-a-dish Method for Antiepileptic Drug Discovery
Madison Schenkel1, Jing Lu1, Shabnam Ghiasvand1, and Tawfegh Bardakhchian1
1Lehigh University, Bethlehem, PA

SAT-495 Investigating the Role of Astrocytes in Neuronal Networks In Vitro
Marguerite Schoen1
1University of Pennsylvania, Philadelphia, PA

SAT-496 Electrical Characterization of Softening Encapsulation Materials in Flexible Thin Film Implantable Devices
Kevin Ding1, Alexandra Jasti-Inay1, and Walter Volf1
1University of Texas at Dallas, Plano, TX, 2University of Texas at Dallas, Richardson, TX

SAT-497 Fabrication of a Timed-Pressure Regulator (TPR) to Enable the Study of Bladder Pain
Marissa Behun1, Neal McQuaid1, Benjamin Goldschmidt1, and Benedict Kolb1
1Duquesne University, Pittsburgh, PA

SAT-498 Spatial Memory Maintenance in Dorsal Premotor Cortex
Nathan Fleming1, Nicholas Pavlouky1, and Aaron Baital1
1University of Pittsburgh, Pittsburgh, PA

SAT-499 Electrical and Histological Characterization Along the Shank of a Silicon Microelectrode Array
Nicholas L. Hibbert1, Janak Gair1, Heu Chang Lee2, Mary Regan1, and Karen J. Geske1
1University of Florida, Gainesville, FL, 2University of Texas Southwestern Medical Center, Dallas, TX

SAT-500 Inducing Myelination in Schwann Cells Using Brief Electrical Stimulation In Vitro
Nicole Balmont1, Erin Patrik1, Christine Schmidt1, and Sahba Mobin1
1University of Florida, Gainesville, FL

SAT-501 The Effect of Nanopatterned Surfaces on Intracortical Microelectrode Biocompatibility
Seth Meade1,2, Cara Smith1,2, Anupam Capadona1,2, and Evon Ereifej1,2
1Case Western Reserve University, Cleveland, OH, 2University of Alabama at Birmingham, Birmingham, AL, 3University of Alabama at Birmingham, Birmingham, AL
SAT-502 Calcium Oscillations in In Vitro Neuronal Cultures after Trauma
Shreya Uditani, Xinlin Chen, Luisa Cachaux1, Joseph Moskal1, Jack Phillips1, and John Fien1
NorthShore University HealthSystemResearch Institute, Evanston, IL, 2Northwestern University, Chicago, IL

SAT-503 Novel Application of Spectral Curve Clustering for Electrode Assignment in SEEG
Taylor Tomita, UIC San Diego, La Jolla, CA

SAT-504 Development of UV Laser System to Etch Parylene C At The Micron Scale
Yousuf Askari, Gusan Zhang, Zichao Bai1, and Martin Han1
University of Connecticut, Storrs, CT

SAT-505 Exploring Neuro-Immune Interaction in Chronic Migraine
Zhao Zhang1
Washington University in St. Louis, Saint Louis, MO

Byeong Chan Choi, Dae Soon Kwon1, and Tae Soo Ba1
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Catholic Institute for Applied Anatomy College of Medicine, The Catholic University of Korea, Seoul, Korea, Republic of

SAT-510 Material Wear Analysis of a Novel Surface Modification Technique for Titanium Implants
Charles Hayes1, Sarah Helms1, and John DesJardins1
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SAT-512 LIPUS Treatment with Presence of Polymer Microbubbles Induces Osteogenesis in MC3T3 Cells
Richie Ramdhane1, Connor Watson, Wonsae Lee1, Xiaofei Li1, and Yuan Qin1
Stony Brook University, Stony Brook, NY

SAT-513 Balance Recovery and Gait Adaptations in Response to Mediolateral Perturbations
Daniael Marz1, Franco DeLaner1, Sreeprathee Mohan, Rahul Soang11, Victoria Smith1, Chris Frames1, and Thomas Lockhart1
Arizona State University, Tempe, AZ
Chapman University, Irvine, CA

SAT-514 Bone Plates Covered with Electrosyn PDGF Mats Renee Bicab1, Danielle Moll1, Matthew MacEwan1, and Wilson Ray1
Washington University School of Medicine, St. Louis, MO

SAT-515 Developing Pressure-Adaptive Shoes Payton Tharp1, Sarah McNichols1, Jon Kerley1, Lucas Schmidt1, and Delphiene Delean1
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SAT-516 The Effect Of Anticipatory Postural Adjustments On Balance When Perturbed
Danae Kim1, Stephanie Huang1, and He Huang1
North Carolina State University, Raleigh, NC

SAT-517 In Vivo Muscle Architecture Data for Musculoskeletal Models of the Human Leg
Felipe Sustaita1, James Charles1, and William Anderson1
University of Pittsburgh, Pittsburgh, PA

SAT-518 Compensation In The Forelimb After Body Weight Supported Treadmill Training In Spinal Cord Injury Rats
Gabrielle Gehrin1, Shaniz Shaj1, Brittany King1, Jason Wilko1, Jennifer Kadi21, and Anita Singh12
Wildiner University, Chester, PA; Rowan University, Glassboro, NJ

SAT-519 Design and Use of a Bilateral Grip Strength Device for Assessing Forelimb Function in Rodents
Charissa Kury1, Alan Reiter1, Ryan Carstel1, Pastel Andre1, Chelsey Dunham1, Aaron Chamberlain1, and Spencer Lake1
Washington University in St. Louis, St. Louis, MO

SAT-520 Effects of Osteoporosis and Bisphosphonate Treatment on the Osseointegration of Titanium Implants in an Aged Rat Model
Iyma Nakai1, Ethan Luz1, Beneg Elk1, D. Joshua Cohen1, Ziv Schwartz1, and Barbara Baryon12
1Virginia Commonwealth University, Richmond, VA
2University of Virginia, Charlottesville, VA
3University of Texas Health Science Center at San Antonio, San Antonio, TX
4Georgia Institute of Technology, Atlanta, GA

SAT-521 The Effects Of Knee-Ankle-Foot Orthosis On The Gait Of Bilateral Achilles Tendon Contractions
Janki Patel1 and Ha Xu1
Mercy University, Music, GA

SAT-522 Variation In Defect Parameters In Aligned Nanofibrous Scaffolds Yields Diverse Strain Attenuation Profiles
Kimberly Delaunay1, Tonia Terrin1, and Robert Maus1
New Jersey Institute of Technology, Newark, NJ
University of Pennsylvania, Philadelphia, PA

SAT-523 Modulating Inflammation Through Cartilage-Derived Extracellular Matrix for Potential Treatments of Cartilage Disease
Maddie Fitch1, Rocky Tuan1, Fang Lin1, and He Sh8n1
University of Pittsburgh; CCME, Pittsburgh, PA

SAT-524 Integrin & F17 & F19 Signaling Regulates Myoblast Syncytium Formation
Masha Rash1, Michael McClure1, Joshua Cohen1, Barbara Baryon1, and Zach Sch1
Virginia Commonwealth University, Richmond, VA

SAT-525 The Cardinal Method of High Density Biosensor Display
Nicholas Zinnith1, Lutchi Pan1, Ming Liu2, and He (Helen) Huang2
University of Maryland, Baltimore County, Baltimore, MD
2University of Alabama, Tuscaloosa, AL

SAT-526 Lubricating Properties of Purified Bovine Bovine Linicura
Nicola Couturier1, Elizabeth Feeeney2, Rebecca Kean2, and Laurenza Bonario2
1University of Maryland, Baltimore County, Baltimore, MD
2Cornell University, Ithaca, NY

SAT-527 Revison Reasons and Damage Metodes of Metallic Augments Used in Total Knee Arthroplasty
Paula R. Limberg1, Gynemba B. Higgs1, Daniel W. MacDonald1, and Steven M. Kury1
1University of Illinois at Urbana-Champaign, Urbana, IL; 2Drexel University Implant Research Center, Philadelphia, PA, 3Exponent, Inc., Philadelphia, PA

SAT-528 Assessment of EEG to Determine Cortical Activity during Walking with a Robotic Knee Exoskeleton
Rachel Belfiore1, Zachary Leaver, Diane Daman1, and Thomas Bulea1 National Institutes of Health, Bethesda, MD
University of Rhode Island, Kingston, RI

SAT-529 Analysis Of Postural And Electromyographic Differences In Adolescents With idiopathic Scoliosis: A Pilot Study
Rachel Teeter1, Michael De Gregorio1, Nick Chat, Emily Miller1, Kerry Denslow1, and Todd Dillette
The Ohio State University, Columbus, OH; Wake Forest School of Medicine, Winston-Salem, NC
University of Maryland, College Park, MD; Middlebury College, Middlebury, VT

SAT-530 Relationship Of Muscle Activation Amplitude With Elongation And Mechanical Properties Of The Achilles Tendon
Rene Lopez1, Jennifer Zeller1, Sheldon Parker1, and Karin Greinke Silvermann1
Johns Hopkins University, Baltimore, MD; University of Delaware, Newark, DE

SAT-531 A Comparative Analysis of Medial Tibial Strains in Mobile and Fixed Bearing Total Knee Replacements
Jacob Aulbaugh1, Kayla Gerken1, Erin Minervini1, and Renee Riggio1Rose-Hulman Institute of Technology, Terre Haute, IN

SAT-532 Characterization of Antimicrobial Susceptibility Of Bacterial Biofilms On Cancellous Bone
Rex Mos1, Vjaja Sabapathy2, Sandra Zamer1, Alex McManus3, and Derek Overstreet1
1Arizona State University, Tempe, AZ; 2University of Arizona, College of Medicine, Phoenix, AZ; 3Sonoran Biosciences, Inc., Chandler, AZ

SAT-533 Determining the Location of Stress and Strain on Proximal Tibia Following Reconstruction
Rita Maciol1, Rose University, Aleson, NJ

SAT-534 Using Affinity Interactions to Improve Antibiotic Activity in PMMA Bone Cement
Sara Hurley1,2, Erika Cypriano1, and Horst von Recum1
1Fordham University, Bronx, NY; 2Case Western Reserve University, Cleveland, OH

276
BMES 2017 | Phoenix
277
BMES 2017 | Phoenix
SAT-535  VioArm: A Customized Prosthetic Arm  
Yasser Ahmadi1, Mona Elhoseiny1, Abdullahroma Gouda, Rasha Salha1, Elan Noivosky1, Laurence Bray1, Vasiiki Ilononidoy1, and Wilsen Jones 1
¬George Mason University, Fairfax, VA

SAT-536  The Preliminary Development of a Novel Lightweight Transradial Prosthetic Able Of Withstanding Mechanical Forces during Human Falls  
Sarah McElhin1, Aladin Maksoud1, and Jeffrey La Bella1 1
¬Arizona State University, Tempe, AZ, 2-Mayo Clinic Arizona, Tempe, AZ

SAT-537  Gait Compensation While Walking in an Immersive Virtual Environment With and Without Coupled Treadmill-Base Perturbations  
Las Ram1, Scott Backendorf1 1
¬Marquette University, Milwaukee, WI

SAT-559  A Novel Approach For Pitting Evaluation In Lower Limb Amputees  
Utku Gokalp1,2, Ming Liu1, and He (Helen) Huang1 1
¬University of North Carolina at Chapel Hill and North Carolina State University, Raleigh, NC, 2-Assist Equipment Development, Inc., Cary, NC

SAT-564  Altered Reality Assisted Bronchoscopcy  
Edward Peterson1 and Zhao Zhu1 1
¬Fayetteville State University, Fayetteville, NC, 2-East Carolina University, Greenville, NC

SAT-565  Evaluating the Properties of a Gallium-Conjugated Sideropherope Complex as an Antibacterial Treatment  
Connie Nguyen1, Demetri Cerdol1, Pardita Enkehsahl1, Paul Hart1, Cameron Hamer1, Rae Heman1, Margo Huffman1, Tash Lee1, and Taylor Liu1 1
¬University of Maryland, College Park, College Park, MD

SAT-566  Effects of Ambient Room Temperature Fluctuations on C57BL/6 Mice on Sensori-Limbocmotor Behavioral Outcomes  
Hana Ullman1, Jessica Pawelski1, Elizabeth English-Chiaruzzi1, and Candice Brown1 1
¬West Virginia University, Morgantown, WV

SAT-567  Effect of Salt Component on the Properties of Flow-Assembled Chitosan Membranes  
Jessie Williams1, Christopher Rauti1, and XiaoLong Luo1 1
¬The Catholic University of America, Washington, DC

SAT-568  Effect of ECM Derived Hydrogel on Peripheral Nerve Injuries  
Kathryn Labell1, Robert Hartoy1, and Christine Heisler1 1
¬University of Pittsburgh, Pittsburgh, PA

SAT-569  Barcoding Cells for Multiplexed CyTOF Staining Panel Optimization  
Amy Van Deusen1, Irene Cheng1, Chris Dappman1, and Eli Zunder1 1
¬University of Virginia, Charlottesville, VA, 2-University of Virginia, Charlottesville, VA

SAT-570  Tissue Simulant Materials for Studying Blast-Induced Traumatic Brain Injury Mechanisms  
Kaiwei Welsh1, Anna Werner1, Joseph Karam1, Ricardo Mejia-Acevedo1, Adam Wilks1, and Michaelaam Tan1 1
¬New Mexico State University, Las Cruces, NM, 2-Mayo Clinic, Rochester, MN

SAT-571  Optimizing Prosthetic Limbs  
Krzysztof Krupaczy1, and Anthony Gruppo2 1
¬Florida Gulf Coast University, Fort Myers, FL

SAT-572  The Effect of Optical Flow on Human Upright Posture Control in a Virtual Reality Environment  
Marin Richards1, Brian Sylvester1, and Chia-Cheng Lin1 1
¬University of North Carolina at Chapel Hill, 2-Mayo Clinic Arizona, Tempe, AZ

SAT-573  Patient-Specific Cerebral Aneurysm Fixtures for Endovascular Coil Design  
Ryan Hess1 1
¬Arizona State University, Tempe, AZ

SAT-574  Assembly of Chitosan Membranes Cross-linked with Sodium Tripolyphosphate in Microfluidics  
Saba Ow1 and Xiaolong Luo2 1
¬The Catholic University of America, Washington, DC

SAT-575  Regulates T Cell Delay Beta Cell Death by Supposing C8β + T Cell Cytotoxic Function  
Sanam Rosenberg1, Qian Xu1, Mustafa Cagdas Ordax1, and Ali Cinar1 1
¬Illinois Institute of Technology, Chicago, IL

SAT-576  Comparing Machine Learning Algorithms for Real-time Continuous Image Processing of Live Cell Cultures  
Sarah Mich1, Angelica Alexander-Bryant1, Jerome McClendon1, and Jordan Gilmore1 1
¬Virginia Commonwealth University, Richmond, VA, 2-Clemson University, Clemson, SC

SAT-577  Using Bluetooth Proximity in Creating a Wearable Fitness Tracker for a Family-based Child Obesity Prevention Strategy  
Steven Cramarc1, Brandon Zhaung1, Anna Haidar1, Vinod Madyanwala1, and Mei Lin Chan1 1
¬Stony Brook University, Stony Brook, NY

SAT-584  Epithelial Membrane of Fibroblast Function In Airway Organoids  
Asea Yim Ida1, Gi Tan1, and David Tschumperlin1 1
¬Cornell University, Ithaca, NY, 2-Mayo Clinic, Rochester, MN

SAT-585  Harnessing In Vivo Biochemical and Biophysical Cues for Stem Cell Biomaterials Engineering  
Anna Gill1, John Want1, and Yong Yang1 1
¬West Virginia University, Morgantown, WV

SAT-586  Effects of Immunosuppressive Drugs on the Survival and Beating Patterns of hNPC Derived Cardiomycocytes  
Boun Haeng1, Bonnie Arendt1, Susana Cantero-Peral1, Frank Secret1, and Timotho Nelson1 1
¬University of Illinois at Urbana-Champaign, Champaign, IL, 2-Mayo Clinic, Rochester, MN

SAT-587  Engineering a New Docking Site in Stem Cells to Easily Target Genetic Circuit Integration  
Chas Henry3, and Dev L. DeWeese3 1
¬University of Utah, Salt Lake City, UT

SAT-588  Engineering a Gene Expression Drvier to Uncover Novel Signals Directing Stem Cell Niche Morphogenesis  
Julia Har1, Lauren Anllo2, and Stephan Dinh3 1
¬Pennsylvania State University, West Chester, PA, 2-Mayo Clinic Arizona, Tempe, AZ, 3-University of Pennsylvania, Philadelphia, PA
SAT-623
Improving Force Generation of In Vitro Skeletal Tissue Models
Oluwaseunmi Anyi', Druc Aydin', and Taher Saif
Pennsylvania State University, University Park, PA, USA and Illinois Institute of Technology, Chicago, IL, USA

SAT-624
Designing and Characterizing Fibrin Microthread Composite Layers
Patrick L. Garza', Megan O'Brien', Marianne Kanelis', and George Deasy
Florida International University Honors College, Miami, FL, USA, and Worcester Polytechnic Institute, Worcester, MA, USA

SAT-625
In Vitro Model of Breast Cancer Metastasis in Bone Microenvironment
Roger Charvát', Vera Mayoz', Anne Bowlén', and Ashutosh Agarwal
University of Miami, Miami, FL, USA

SAT-626
In Situ Production of a Biomimetic Lung-on-a-Chip in a Microfluidic Delivery System
Rosemary Claire Butler', Shiny-Amala Praya Page', Sean Murphy', and Adam R. Hall
Arizona State University, Phoenix, AZ, USA

SAT-627
Effect of PNS-ECM Hydrogel on Functional Recovery after Peripheral Nerve Injury
Ruben Hartog', Christine Hix', Kathryn LaBelle', Travis Press', and Bryan Brown
University of Pittsburgh, Pittsburgh, PA

SAT-628
Encapsulation of Mesenchymal Stromal Cells in Alginate for the Treatment of Osteoarthritis
Sarah Saller
Rutgers University, Summit, NJ

SAT-629
Complex 3D Tissue Assembly Using Flat High-Density Cell Sheets
Shyala Coller', Uma Balakrishnan', and Lance Davidson
University of Pittsburgh, Pittsburgh, PA

SAT-630
The Effect of Spinach and Green Tea on Wound Healing
Sheesha Ayakale', Ashwana Desai', and Ranke Olabisi
Rutgers University, Piscataway, NJ

SAT-631
Nutritional Supplementation for Myoblast Proliferation and Differentiation
Sudeep Vedula', Daniel Brown', Joseph Freeman', Nimesh Padil', and Mayhoud Darmo
Rutgers, the State University of New Brunswick, Piscataway, NJ, USA and Montclair State University, Montclair, NJ, USA

SAT-632
Optimization and Characterization of 3D Human Prepubertal Testicular Organoid System
Sue Zhang', Nima Pourahbasi Zaredd', Anthony Atalay', and Homam Sedki
University of Rochester, Rochester, NY, USA, Wake Forest Institute for Regenerative Medicine, Winston-Salem, NC, USA

SAT-633
A Three-Dimensional Neural Sphere Model for Studying Ischemic Stroke
Taylor Pullinger', Liane Kramer', Samantha Zambuto', Meghan Buonomo', Victor Cui', Liane Livi', and Aurora Washington'
Brown University, Providence, RI, USA and Georgetown University, Washington, DC

SAT-634
Modeling Dual Delivery of Proangiogenic Peptides from Hydrogel Biomaterials for Neovascularization of Ischemic Tissue
Wesley Lo
Windsor Institute of Technology, Chicago, IL, USA

SAT-635
Diffusivity Analysis of Hydrogels for Conformal Coating and Transplantation of Islets of Langerhans
Laura Morales', Vita Marzocchi', and Alice Tumel'
University of Miami, Coral Gables, FL, USA and University of Miami, Miami, FL, USA

SAT-636
Effect of Minerals on Human Mesenchymal Stem Cells
Madyson Muscarello', Lauren Cross', Jake Carrow', and Alice Tomei'
Texas A&M University, College Station, TX

SAT-637
Revisiting CSD Propagation Characteristics with Microelectrode Arrays: From Spiking to Field Potentials
Daniel Rivera', Anah Meshkiforsou', Darlena Ramirez', Yisichao Man', and Jorge Beier
Florida International University, Miami, FL, USA and University of Minnesota, Minneapolis, MN

SAT-638
Adapalene Loaded Polymeric Nanoparticles as a Novel Therapeutic for the Treatment of Amyotrophic Lateral Sclerosis in SOD1 G93A Mouse Model
Collin Teague', David Medina', Eugene Chung', Ricki Cleton', Robert Brown', and Rachael Schenk
Arizona State University, Phoenix, AZ, USA and Barrow Neurological Institute, Phoenix, AZ, USA
Program At-A-Glance | Thursday | October 12, 2017

**TRACK**

8:00 am–9:30 am | 1:30 pm–3:00 pm | 3:45 pm–5:15 pm

**BIOMEDICAL ENGINEERING AND EDUCATION**

<table>
<thead>
<tr>
<th>Track</th>
<th>Room/Location</th>
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<tbody>
<tr>
<td>ABET Criteria Workshop</td>
<td>Room 122C</td>
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**BIOMEDICAL IMAGING & OPTICS**

<table>
<thead>
<tr>
<th>Track</th>
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<tbody>
<tr>
<td>Imaging in Neuroscience and Brain Initiative</td>
<td>Room 225A</td>
</tr>
<tr>
<td>Optical Coherence Tomography and Adaptive Optics</td>
<td>Room 225A</td>
</tr>
<tr>
<td>Imaging Strategies and Molecular Profiling in Cancer</td>
<td>Room 225A</td>
</tr>
<tr>
<td>Imaging and Translational Respiratory Engineering</td>
<td>Room 225A</td>
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**CANCER TECHNOLOGIES**

<table>
<thead>
<tr>
<th>Track</th>
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<tbody>
<tr>
<td>Cancer Immunotherapy</td>
<td>Room 221A</td>
</tr>
<tr>
<td>Tumor Microenvironment</td>
<td>Room 221A</td>
</tr>
<tr>
<td>Cancer Mechanobiology II</td>
<td>Room 221C</td>
</tr>
<tr>
<td>Computational Modeling of Cancer</td>
<td>Room 221C</td>
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**CARDIOVASCULAR ENGINEERING**

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<tr>
<td>Angiogenesis and Engineered Vascularization</td>
<td>Room 221A</td>
</tr>
<tr>
<td>Cardiac Electrophysiology</td>
<td>Room 221A</td>
</tr>
<tr>
<td>Heart Valve Structure, Function, and Disease</td>
<td>Room 221A</td>
</tr>
<tr>
<td>Cardiac Tissue Engineering II</td>
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**CELLULAR & MOLECULAR BIOENGINEERING**

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<tr>
<td>Substrate Effects in Mechnobiology I</td>
<td>Room 221B</td>
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<tr>
<td>Engineering Stem Cell Differentiation and Dedifferentiation</td>
<td>Room 221C</td>
</tr>
<tr>
<td>Cellular and Molecular Mechanobiology</td>
<td>Room 221B</td>
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**DEVICE TECHNOLOGIES AND BIOMEDICAL ROBOTICS**

<table>
<thead>
<tr>
<th>Track</th>
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<tbody>
<tr>
<td>Wearable Sensors</td>
<td>Room 221D</td>
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<tr>
<td>Prosthetics and Orthotics</td>
<td>Room 223</td>
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**DRUG DELIVERY**

<table>
<thead>
<tr>
<th>Track</th>
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<tr>
<td>Targeted or Responsive Delivery Systems</td>
<td>Room 221E</td>
</tr>
<tr>
<td>Delivery Systems for Proteins and Vaccines</td>
<td>Room 221E</td>
</tr>
<tr>
<td>Multi-scale Strategies for Therapeutic Delivery</td>
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**NANO AND MICRO TECHNOLOGIES**

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<th>Track</th>
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<tr>
<td>Organ-on-Chip Models for Study of Disease and Drug Discovery I</td>
<td>Room 222A</td>
</tr>
<tr>
<td>Organ-on-Chip Models for Study of Disease and Drug Discovery II</td>
<td>Room 222A</td>
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**NEURAL ENGINEERING**

<table>
<thead>
<tr>
<th>Track</th>
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<tr>
<td>Neural Cell Model Systems</td>
<td>Room 223A</td>
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<tr>
<td>Imaging in Neuroscience and Brain Initiatives</td>
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**ORTHOPEDIC AND REHABILITATION ENGINEERING**

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<th>Track</th>
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<tbody>
<tr>
<td>Devices for Neural and Rehabilitation Engineering</td>
<td>Room 226C</td>
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<tr>
<td>Orthopaedic Mechanobiology</td>
<td>Room 226C</td>
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**REPRODUCTIVE BIOENGINEERING**

<table>
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<th>Track</th>
<th>Room/Location</th>
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<tbody>
<tr>
<td>Modeling of the Female Reproductive System</td>
<td>Room 226C</td>
</tr>
<tr>
<td>Imaging and Translational Respiratory Engineering</td>
<td>Room 226C</td>
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**STEM CELL ENGINEERING**

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<tr>
<td>Engineering Stem Cell Differentiation and Dedifferentiation</td>
<td>Room 222A</td>
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<tr>
<td>Stem Cells in Tissue Engineering</td>
<td>Room 222A</td>
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**TISSUE ENGINEERING**

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<th>Track</th>
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<tr>
<td>Cardiac Tissue Engineering I</td>
<td>Room 221A</td>
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<tr>
<td>Tissue Engineering</td>
<td>Room 221B</td>
</tr>
<tr>
<td>Tissue Engineering</td>
<td>Room 221C</td>
</tr>
<tr>
<td>Organ-on-Chip Models for Study of Disease and Drug Discovery I</td>
<td>Room 222A</td>
</tr>
<tr>
<td>Organ-on-Chip Models for Study of Disease and Drug Discovery II</td>
<td>Room 222A</td>
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**TRANSITIONAL BIOMEDICAL ENGINEERING**

<table>
<thead>
<tr>
<th>Track</th>
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<tbody>
<tr>
<td>Translational Biomedical Engineering</td>
<td>Room 226C</td>
</tr>
<tr>
<td>Imaging and Translational Respiratory Engineering</td>
<td>Room 226C</td>
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**INDUSTRY**

<table>
<thead>
<tr>
<th>Track</th>
<th>Room/Location</th>
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<tbody>
<tr>
<td>8:00 am–9:00 am Designs of Project Management</td>
<td>Room 125AB</td>
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<tr>
<td>9:00 am–10:00 am Verification and Validation of Medical Devices</td>
<td>Room 125AB</td>
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**OTHER**

<table>
<thead>
<tr>
<th>Track</th>
<th>Room/Location</th>
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<tbody>
<tr>
<td>Training New Leaders in Healthcare Innovation: Graduate Training Programs</td>
<td>Room 122C</td>
</tr>
<tr>
<td>Defining Educational Goals for the 21st Century</td>
<td>Room 122C</td>
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**STUDENT AND EARLY CAREER**

<table>
<thead>
<tr>
<th>Track</th>
<th>Room/Location</th>
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<tbody>
<tr>
<td>9:00 am–10:00 am Biomaterials: A Required Course for the 21st Century</td>
<td>Room 124A</td>
</tr>
<tr>
<td>1:00 pm–2:00 pm BMES Special Interest Group Overview</td>
<td>Room 124A</td>
</tr>
<tr>
<td>2:00 pm–5:00 pm Entrepreneur Workshop</td>
<td>Room 124A</td>
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**PROGRAM AT-A-GLANCE—THURSDAY**

<table>
<thead>
<tr>
<th>Program</th>
<th>Room/Location</th>
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<tbody>
<tr>
<td>Neural Injury and Spinal Cord Model Systems</td>
<td>Room 223B</td>
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<tr>
<td>Peripheral Repair</td>
<td>Room 223B</td>
</tr>
<tr>
<td>Orthopaedic Mechanobiology</td>
<td>Room 226C</td>
</tr>
<tr>
<td>Spine, Bone, and Associated Tissue</td>
<td>Room 226C</td>
</tr>
<tr>
<td>Prosthetics and Orthotics</td>
<td>Room 226C</td>
</tr>
<tr>
<td>Organ-on-Chip Models for Study of Disease</td>
<td>Room 221B</td>
</tr>
<tr>
<td>Organ-on-Chip Models for Study of Disease</td>
<td>Room 221C</td>
</tr>
<tr>
<td>BMES Entrepreneurship Careers</td>
<td>Room 124A</td>
</tr>
<tr>
<td>BMES Alternative Careers</td>
<td>Room 124A</td>
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# Program At-A-Glance — Friday, October 13, 2017

<table>
<thead>
<tr>
<th>TRACK</th>
<th>8:00 am–9:30 am</th>
<th>1:15 pm–2:45 pm</th>
<th>3:30 pm–5:00 pm</th>
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</thead>
<tbody>
<tr>
<td><strong>BIOMATERIALS</strong></td>
<td>Biologics for Regenerative Medicine I  Room 221A  Integration of Biomaterials with Chips and Devices  Room 224A</td>
<td>Biologics for Regenerative Medicine II  Room 221A  Drug Delivery: Biomaterials I  Room 224B</td>
<td>Biologics for Regenerative Medicine III  Room 221B  Drug Delivery: Biomaterials II  Room 224B</td>
</tr>
<tr>
<td><strong>MOLECULAR BIOENGINEERING</strong></td>
<td>Molecular and Cellular Engineering Functional Materials and Sensors  Room 228B  Gene Delivery and Genomic Biomanufacturing  Room 228B</td>
<td>CMG Young Innovators I  Room 228B  CMG Young Innovators II  Room 228B</td>
<td>Engineering Multi-cellular Systems  Room 228B</td>
</tr>
<tr>
<td><strong>BIOMECHANICS</strong></td>
<td>The Nucleus and Cytoskeleton in Mechanobiology  Room 225A  Cardiovascular Biomechanics  Room 225B</td>
<td>The Nucleus and Cytoskeleton in Mechanobiology  Room 225A  Cardiovascular Biomechanics  Room 225B</td>
<td>The Nucleus and Cytoskeleton in Mechanobiology  Room 225A  Cardiovascular Biomechanics  Room 225B</td>
</tr>
<tr>
<td><strong>CANCER TECHNOLOGIES</strong></td>
<td>Cancer Cell Motility and Migration  Room 226A  Breast Cancer Stem Cells  Room 226B</td>
<td>Molecular Profiling in Cancer  Room 226A  Circulating Biomarkers: CTCL, Extracellular Vesicles and DNA I  Room 226A</td>
<td>Molecular Profiling in Cancer  Room 226A  Circulating Biomarkers: CTCL, Extracellular Vesicles and DNA II  Room 226A</td>
</tr>
<tr>
<td><strong>CARDIOVASCULAR ENGINEERING</strong></td>
<td>Cardiovascular Biomechanics  Room 227A  Cardiovascular Imaging  Room 227B</td>
<td>Hemodynamics and Vascular Mechanics I  Room 227A  Hemodynamics and Vascular Mechanics II  Room 227B</td>
<td>Hemodynamics and Vascular Mechanics I  Room 227A  Hemodynamics and Vascular Mechanics II  Room 227B</td>
</tr>
<tr>
<td><strong>CELLULAR &amp; MOLECULAR BIOENGINEERING</strong></td>
<td>The Nucleus and Cytoskeleton in Mechanobiology  Room 228A  Molecular and Cellular Biomechanics  Room 228B  Gene Delivery and Genomic Biomanufacturing  Room 228B</td>
<td>CDI Young Innovators I  Room 228B  CDI Young Innovators II  Room 228B</td>
<td>CDI Young Innovators I  Room 228B  CDI Young Innovators II  Room 228B</td>
</tr>
<tr>
<td><strong>BIODEVICES &amp; BIOMEDICAL ROBOTICS</strong></td>
<td>Biosensors I  Room 229A  Integration of Biologics with Chips and Devices  Room 229B</td>
<td>Biosensors II  Room 229A  Upper Limb Exoskeletons  Room 229B</td>
<td>Biosensors II  Room 229A  Upper Limb Exoskeletons  Room 229B</td>
</tr>
<tr>
<td><strong>DRUG DELIVERY</strong></td>
<td>Drug Delivery: Biomaterials I  Room 221A  Drug Delivery: Biomaterials II  Room 221B</td>
<td>Drug Delivery: Biomaterials II  Room 221B  Organ-on-a-Chip Models for Drug Discovery and the Study of Disease II  Room 221A</td>
<td>Drug Delivery: Biomaterials III  Room 221B  Drug Delivery for Tissue Engineering and Medicine  Room 221B</td>
</tr>
<tr>
<td><strong>NANO AND MICRO TECHNOLOGIES</strong></td>
<td>Micro/Nano Tools in Molecular Biology  Room 228C</td>
<td>NEMS in Medicine  Room 228D</td>
<td>Micro/Nano Tools in Nanotechnology  Room 228D</td>
</tr>
<tr>
<td><strong>NEURAL ENGINEERING</strong></td>
<td>Peripheral Nerve Stimulation  Room 221A</td>
<td>Deep Brain Stimulation  Room 221B</td>
<td>Sensory Neuroprostheses  Room 221B</td>
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<tr>
<td><strong>ORTHOPEDIC AND REHABILITATION ENGINEERING</strong></td>
<td>Upper-Limb Exoskeletons  Room 221A</td>
<td>Upper-Limb Exoskeletons  Room 221A</td>
<td>Upper-Limb Exoskeletons  Room 221A</td>
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<tr>
<td><strong>REPRODUCTIVE BIOENGINEERING</strong></td>
<td>Engineering the Stem Cell Microenvironment  Room 221A</td>
<td>Engineering the Stem Cell Microenvironment  Room 221A</td>
<td>Organ and Engineered Tissue Biofabrication  Room 221A</td>
</tr>
<tr>
<td><strong>STEM TISSUE ENGINEERING</strong></td>
<td>Engineering the Stem Cell Microenvironment  Room 221A</td>
<td>Engineering the Stem Cell Microenvironment  Room 221A</td>
<td>Organ and Engineered Tissue Biofabrication  Room 221A</td>
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<tr>
<td><strong>TISSUE ENGINEERING</strong></td>
<td>Tissue Engineering  Room 221A</td>
<td>Tissue Engineering  Room 221A</td>
<td>Tissue Engineering  Room 221A</td>
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<tr>
<td><strong>TRANSLATIONAL BIOMEDICAL ENGINEERING</strong></td>
<td>Micro/Nano Tools in Medicine  Room 221A</td>
<td>Micro/Nano Tools in Medicine  Room 221A</td>
<td>Micro/Nano Tools in Medicine  Room 221A</td>
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<tr>
<td><strong>INDUSTRY</strong></td>
<td>8:00 am–10:45 am</td>
<td>8:00 am–10:45 am</td>
<td>8:00 am–10:45 am</td>
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<tr>
<td><strong>OTHER</strong></td>
<td>Cancer Options for the BMES Graduate Students and Postdoctoral Fellows  Room 1200</td>
<td>Sympoism in Honor of Dr. and Mrs. Athanasiou  Room 1202</td>
<td>Symposium in Honor of Dr. and Mrs. Athanasiou  Room 1202</td>
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<tr>
<td><strong>STUDENT AND EARLY CAREER</strong></td>
<td>9:00 am–10:00 am</td>
<td>11:30 am–1:15 pm</td>
<td>1:30 pm–6:30 pm</td>
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<td>1:30 pm-3:00 pm</td>
<td>3:15 pm-4:45 pm</td>
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<tr>
<td><strong>BIOMATERIALS, COMPUTATIONAL AND SYSTEMS BIOLOGY</strong></td>
<td>Systems Biology of Infectious Disease Room 221A</td>
<td>Novel Methods for Systems Biology Room 221A</td>
<td>Analysis of Cell Signaling Room 221A</td>
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<td></td>
<td>Stem Cells Systems Biology Room 221C</td>
<td>Computational Modeling in Cardiovascular Systems Room 221A</td>
<td></td>
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<tr>
<td><strong>BIOMECHANICS</strong></td>
<td>Biomaterials Scaffold II Room 224A</td>
<td>Hydrogel Biomaterials I Room 224A</td>
<td>Hydrogel Biomaterials II Room 224A</td>
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<td>Drug Delivering Biomaterials IV Room 224B</td>
<td>Natural and Bioinspired Biomaterials I Room 224B</td>
<td>Natural and Bioinspired Biomaterials II Room 224B</td>
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<tr>
<td><strong>BIOMEDICAL ENGINEERING EDUCATION</strong></td>
<td>Imaging Techniques in Biomechanics Room 227A</td>
<td>Orthopedic: Mechanobiology and Mechanotransduction Room 227A</td>
<td>Biomechanics of Biomaterials Room 227A</td>
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<td>Rehabilitation Biomechanics Room 227B</td>
<td>Biomechanics in Cell and Tissue Engineering Room 227B</td>
<td>Mechanobiology of the Cardiovascular System Room 227B</td>
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<tr>
<td><strong>BIOMEDICAL IMAGING &amp; OPTICS</strong></td>
<td>Multiplatform and Added Value Room 227C</td>
<td>Optical Imaging and Nano-Technology Room 227C</td>
<td>Biomedical Imaging and Optics Room 227C</td>
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<tr>
<td><strong>CANCER TECHNOLOGIES</strong></td>
<td>Cancer Drug Delivery Room 228A</td>
<td>Microfluidic Cancer Models Room 228B</td>
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<tr>
<td><strong>CARDIOVASCULAR ENGINEERING</strong></td>
<td>Cardiovascular Devices Room 221A</td>
<td>Cardiovascular Regeneration and Stem Cells Room 221B</td>
<td>Mechanochemistry of the Cardiovascular System Room 221C</td>
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<td>Computational Modeling in Cardiovascular Systems Room 221D</td>
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<tr>
<td><strong>CELLULAR &amp; MOLECULAR BIOENGINEERING</strong></td>
<td>Mechanobiology of Cell Adhesion Room 222A</td>
<td>Mechanobiology of the Vascular and Nervous System Room 222B</td>
<td>Molecular Bioengineering Room 222B</td>
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<td>Molecular and Cellular Immunomodulation I Room 222C</td>
<td>Molecular and Cellular Immunomodulation II Room 222D</td>
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<td>Biomechanics in Cell and Tissue Engineering Room 222E</td>
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**PROGRAM AT-A-GLANCE—SATURDAY**

**TRACK**

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<th>3:15 pm-4:45 pm</th>
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<tbody>
<tr>
<td><strong>DEVICE TECHNOLOGIES AND BIOMEDICAL ROBOTICS</strong></td>
<td>Implantable Sensors I Room 221A</td>
<td>Implantable Sensors II Room 221B</td>
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<tr>
<td></td>
<td>Cardiovascular Devices Room 221D</td>
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<tr>
<td></td>
<td>Translation of Devices from the Lab to the Market Room 221E</td>
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</tr>
<tr>
<td><strong>DRUG DELIVERY</strong></td>
<td>Nano to Micro Devices in Delivery I Room 221F</td>
<td>Drug Delivering Biomaterials IV Room 221G</td>
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<tr>
<td></td>
<td>Nano to Micro Devices in Delivery II Room 221I</td>
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<tr>
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<td>Nano to Micro Devices in Delivery III Room 221J</td>
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<tr>
<td><strong>NANO AND MICRO TECHNOLOGIES</strong></td>
<td>Nano to Micro Devices in Delivery I Room 221K</td>
<td>Nano to Micro Devices in Delivery II Room 221L</td>
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<tr>
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<td>Advances in Micro/Nano Manufacturing Room 221N</td>
<td>Applications of Nanopores and Nanoparticles Room 221O</td>
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<tr>
<td><strong>NEURAL ENGINEERING</strong></td>
<td>Neural Devices Technology Room 221P</td>
<td>CMS Repair and Regeneration Room 221Q</td>
</tr>
<tr>
<td><strong>ORTHOPEDIC AND REHABILITATION ENGINEERING</strong></td>
<td>Articular Cartilage, Meniscus and Joints Room 221R</td>
<td>Orthopaedic: Mechanobiology and Mechanotransduction Room 221S</td>
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<tr>
<td><strong>STEM CELL ENGINEERING</strong></td>
<td>Stem Cell Systems Biology Room 221T</td>
<td>Cardiovascular Regeneration and Stem Cells Room 221U</td>
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<tr>
<td><strong>TISSUE ENGINEERING</strong></td>
<td>Naturally-Derived and Extracellular Matrix Biomaterials in Tissue Engineering Room 221V</td>
<td>Biomechanics in Cell and Tissue Engineering Room 221W</td>
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<td>Advanced Biomanufacturing in Tissue Engineering Room 221X</td>
<td>Musculoskeletal Tissue Engineering Room 221Y</td>
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<tr>
<td><strong>UNDERGRADUATE RESEARCH, DESIGN &amp; LEADERSHIP</strong></td>
<td>Undergraduate Research, Design &amp; Leadership I Room 221Z</td>
<td>Undergraduate Research, Design &amp; Leadership II Room 221AA</td>
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<td>Undergraduate Research Fellowship Program Room 221AC</td>
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<tr>
<td><strong>OTHER</strong></td>
<td>BMES-NSF Special Session on Graduate Research Fellowship Program Room 221BC</td>
<td></td>
</tr>
</tbody>
</table>
## Schedule At-A-Glance

**WEDNESDAY | OCTOBER 11, 2017**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>12:00 noon – 7:00 pm</td>
<td>Registration</td>
<td>North 300</td>
</tr>
<tr>
<td>8:30 am – 4:30 pm</td>
<td>BMES Board of Directors Meeting</td>
<td>126BC</td>
</tr>
<tr>
<td>11:30 am – 4:00 pm</td>
<td>AIMERE Board of Directors Meeting (affiliate event)</td>
<td>127C</td>
</tr>
<tr>
<td>12:30 pm – 3:30 pm</td>
<td>Industry Tours (pre-registration required)</td>
<td>Leave from Conv Ctr</td>
</tr>
<tr>
<td>3:00 pm – 3:30 pm</td>
<td>Mentor Match-Up (pre-registration required)</td>
<td>129AB</td>
</tr>
<tr>
<td>3:30 pm – 5:30 pm</td>
<td>Meet the Faculty Candidates</td>
<td>North 300</td>
</tr>
<tr>
<td>4:00 pm – 5:00 pm</td>
<td>AIMERE Academic Council Meeting (affiliate event)</td>
<td>127C</td>
</tr>
<tr>
<td>4:30 pm – 5:30 pm</td>
<td>Perfecting the First-Time Student and Early Career Attendee Experience</td>
<td>129AB</td>
</tr>
<tr>
<td>4:30 pm – 5:30 pm</td>
<td>Coulter College Steering Committee Meeting</td>
<td>127A</td>
</tr>
<tr>
<td>5:30 pm – 7:30 pm</td>
<td>Welcome Reception</td>
<td>300 Level Foyer</td>
</tr>
<tr>
<td>7:30 pm – 8:30 pm</td>
<td>Industry Committee Planning Meeting (invitation only)</td>
<td>Sheraton-Lawren</td>
</tr>
<tr>
<td>7:30 pm – 10:30 pm</td>
<td>Council of Chairs Dinner &amp; Meeting (invitation only)</td>
<td>Sheraton-Deer Valley</td>
</tr>
<tr>
<td>8:00 pm – 9:00 pm</td>
<td>LGBT Dessert Social (ticket purchase required)</td>
<td>Sheraton-Paradise Valley</td>
</tr>
</tbody>
</table>

**THURSDAY | OCTOBER 12, 2017**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>7:00 am – 6:00 pm</td>
<td>Registration</td>
<td>North 300</td>
</tr>
<tr>
<td>7:00 am – 8:00 am</td>
<td>Council of Industry Chapter Presidents (invitation only)</td>
<td>126A</td>
</tr>
<tr>
<td>7:00 am – 8:00 am</td>
<td>BMES Diversity Committee Meeting</td>
<td>127B</td>
</tr>
<tr>
<td>8:00 am – 9:30 am</td>
<td>BMES National Meetings Committee Meeting</td>
<td>126BC</td>
</tr>
<tr>
<td>8:00 am – 9:00 am</td>
<td>INDUSTRY SESSION</td>
<td>125AB</td>
</tr>
<tr>
<td>8:00 am – 9:30 am</td>
<td>Principles of Project Management</td>
<td>122B</td>
</tr>
<tr>
<td>8:30 am – 9:30 am</td>
<td>BMES Student Affairs Committee Meeting</td>
<td>127C</td>
</tr>
<tr>
<td>9:00 am – 10:00 am</td>
<td>INDUSTRY SESSION</td>
<td>125AB</td>
</tr>
<tr>
<td>9:30 am – 10:00 am</td>
<td>Verification and Validation of Medical Devices</td>
<td>North 300</td>
</tr>
<tr>
<td>9:30 am – 10:00 pm</td>
<td>POSTER SESSION</td>
<td>North 300</td>
</tr>
<tr>
<td>9:30 am – 10:15 pm</td>
<td>POSTER VIEWING WITH AUTHORS &amp; Refreshment Break</td>
<td>North 300</td>
</tr>
<tr>
<td>9:30 am – 10:30 am</td>
<td>BMES Ethics Subcommittee Meeting</td>
<td>127A</td>
</tr>
<tr>
<td>9:00 am – 10:00 am</td>
<td>Networking: Getting Started and Networking in a Diverse 21st Century</td>
<td>124AB</td>
</tr>
<tr>
<td>10:15 am – 11:30 am</td>
<td>PLENARY SESSION</td>
<td>North Ballroom BCD</td>
</tr>
<tr>
<td>10:45 am – 11:15 am</td>
<td>State of the Society &amp; Pritzker Award Lecture</td>
<td>North Ballroom BCD</td>
</tr>
<tr>
<td>11:45 am – 1:15 pm</td>
<td>Celebration of Minorities in BMES Luncheon (ticket purchase required)</td>
<td>West Ballroom 301A</td>
</tr>
<tr>
<td>11:45 am – 1:15 pm</td>
<td>Lunch on Own</td>
<td>North Ballroom BCD</td>
</tr>
<tr>
<td>1:00 pm – 3:00 pm</td>
<td>AEMB—Mentoring for Innovative Design Solutions (MINDS) Workshop—affiliate event</td>
<td>North Ballroom BCD</td>
</tr>
<tr>
<td>1:00 pm – 4:30 pm</td>
<td>Coop/Intern and Industrial Relations Workshop—Part II (by invitation)</td>
<td>129AB</td>
</tr>
<tr>
<td>1:00 pm – 2:00 pm</td>
<td>INDUSTRY SESSION</td>
<td>125AB</td>
</tr>
<tr>
<td>1:15 pm – 2:30 pm</td>
<td>BMES 50th Anniversary Committee Meeting</td>
<td>127A</td>
</tr>
<tr>
<td>1:15 pm – 2:15 pm</td>
<td>BMES Careers in Academia</td>
<td>128AB</td>
</tr>
<tr>
<td>1:30 pm – 2:45 pm</td>
<td>BMES Careers in Industry I</td>
<td>124AB</td>
</tr>
</tbody>
</table>

**THURSDAY | OCTOBER 12, 2017 (continued)**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:30 pm – 3:00 pm</td>
<td>PLATFORM SESSIONS—THURS-2</td>
<td>18 concurrent sessions</td>
</tr>
<tr>
<td>1:30 pm – 3:00 pm</td>
<td>ABET Criteria Workshop</td>
<td>122C</td>
</tr>
<tr>
<td>1:30 pm – 3:00 pm</td>
<td>NIH Funding Panel Session</td>
<td>121ABC</td>
</tr>
<tr>
<td>1:30 pm – 3:00 pm</td>
<td>Defining Educational Goals of the Bioengineering in the 21st Century</td>
<td>122B</td>
</tr>
<tr>
<td>2:00 pm – 5:00 pm</td>
<td>INDUSTRY SESSION</td>
<td>125AB</td>
</tr>
<tr>
<td>2:00 pm – 5:00 pm</td>
<td>Entrepreneur Workshop (ticket purchase required)</td>
<td>129AB</td>
</tr>
<tr>
<td>2:30 pm – 3:30 pm</td>
<td>Ask the Industry Expert</td>
<td>128AB</td>
</tr>
<tr>
<td>2:30 pm – 5:30 pm</td>
<td>5th US-Korea Joint BMES Workshop</td>
<td>122A</td>
</tr>
<tr>
<td>3:00 pm – 3:45 pm</td>
<td>POSTER VIEWING WITH AUTHORS &amp; Refreshment Break</td>
<td>North 300</td>
</tr>
<tr>
<td>3:30 pm – 4:30 pm</td>
<td>Rapid Resume Review</td>
<td>North 300</td>
</tr>
<tr>
<td>3:45 pm – 5:15 pm</td>
<td>Vascular Mechanobiology &amp; Nanotherapeutics</td>
<td>122C</td>
</tr>
<tr>
<td>3:45 pm – 5:15 pm</td>
<td>NIBIB DEBUT Presentations and Awards</td>
<td>121ABC</td>
</tr>
<tr>
<td>3:45 pm – 5:15 pm</td>
<td>Engineering Solutions to Address Health Care Disparities</td>
<td>122B</td>
</tr>
<tr>
<td>3:45 pm – 5:15 pm</td>
<td>PLATFORM SESSIONS—THURS-3</td>
<td>15 concurrent sessions</td>
</tr>
<tr>
<td>4:00 pm – 5:30 pm</td>
<td>AEMB—Annual Grand Meeting (affiliate event)</td>
<td>123</td>
</tr>
<tr>
<td>4:00 pm – 5:15 pm</td>
<td>BMES Entrepreneurship Careers</td>
<td>124AB</td>
</tr>
<tr>
<td>4:00 pm – 5:15 pm</td>
<td>BMES Alternative Careers</td>
<td>129AB</td>
</tr>
<tr>
<td>5:30 pm – 6:30 pm</td>
<td>PLENARY SESSION</td>
<td>North Ballroom BCD</td>
</tr>
<tr>
<td>5:00 pm – 6:00 pm</td>
<td>NIBIB Lecture (Feng Zhang, PhD) &amp; BMES Fellows</td>
<td>North Ballroom BCD</td>
</tr>
<tr>
<td>7:00 pm – 9:00 pm</td>
<td>Industry and Clinical Mixer (ticket purchase required)</td>
<td>The Duce</td>
</tr>
<tr>
<td>8:00 pm – 10:00 pm</td>
<td>University Hosted Receptions</td>
<td>Sheraton Grand Phoenix</td>
</tr>
</tbody>
</table>

**FRIDAY | OCTOBER 13, 2017**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>7:00 am – 6:00 pm</td>
<td>Registration</td>
<td>North 300</td>
</tr>
<tr>
<td>7:00 am – 8:00 am</td>
<td>BMES Education Committee Meeting</td>
<td>127B</td>
</tr>
<tr>
<td>7:00 am – 8:00 am</td>
<td>BMES Industry Advisory Board (invitation only)</td>
<td>126A</td>
</tr>
<tr>
<td>8:00 am – 9:30 am</td>
<td>BMES 2018 Annual Meeting Planning Committee Meeting</td>
<td>126BC</td>
</tr>
<tr>
<td>8:00 am – 9:00 am</td>
<td>BMES International Committee Meeting</td>
<td>127C</td>
</tr>
<tr>
<td>8:00 am – 10:00 pm</td>
<td>INDUSTRY SESSION</td>
<td>125AB</td>
</tr>
<tr>
<td>8:00 am – 9:30 am</td>
<td>PLATFORM SESSIONS—FRID-1</td>
<td>18 concurrent sessions</td>
</tr>
<tr>
<td>8:00 am – 9:30 am</td>
<td>Career Options for the BMES Graduate Students and Postdoctoral Fellows</td>
<td>122C</td>
</tr>
<tr>
<td>8:30 am – 9:30 pm</td>
<td>BMES Student Chapter—Outstanding Chapter Best Practices</td>
<td>128AB</td>
</tr>
<tr>
<td>9:00 am – 10:15 pm</td>
<td>AEMB Annual Ethics Session—Charting the Landscape of For-profit Stem Cell Clinics in the US (affiliate event)</td>
<td>123</td>
</tr>
<tr>
<td>9:00 am – 10:00 am</td>
<td>Graduate School Part I Planning for Graduate School and Getting In</td>
<td>124AB</td>
</tr>
<tr>
<td>9:30 am – 10:45 pm</td>
<td>BMES Student Chapter—Mentoring and Chapter-Industry Best Practices</td>
<td>128AB</td>
</tr>
<tr>
<td>9:30 am – 5:00 pm</td>
<td>Exhibit Hall Open</td>
<td>North 300</td>
</tr>
<tr>
<td>9:30 am – 5:00 pm</td>
<td>POSTER SESSION</td>
<td>North 300</td>
</tr>
<tr>
<td>9:30 am – 10:15 pm</td>
<td>POSTER VIEWING WITH AUTHORS &amp; Refreshment Break</td>
<td>North 300</td>
</tr>
<tr>
<td>10:15 am – 11:15 am</td>
<td>PLENARY SESSION</td>
<td>North Ballroom BCD</td>
</tr>
<tr>
<td>10:15 am – 11:15 am</td>
<td>Wallace H. Coulter Award for Healthcare Innovation Lecture</td>
<td>North Ballroom BCD</td>
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</tbody>
</table>

CC = Convention Center  
SG = Sheraton Grand
## Schedule At-A-Glance

### FRIDAY | OCTOBER 13, 2017 (continued)

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:15 am – 1:00 pm</td>
<td>Lunch on Own</td>
<td></td>
</tr>
<tr>
<td>11:30 am – 1:00 pm</td>
<td>AEMB Annual Reception (tickets required-affiliate event)</td>
<td>123</td>
</tr>
<tr>
<td>11:30 am – 1:00 pm</td>
<td>Women in BME Luncheon (ticket purchase required)</td>
<td>West Ballroom 301A</td>
</tr>
<tr>
<td>1:00 pm – 3:00 pm</td>
<td>INDUSTRY SESSION Clinical Innovators Spotlight</td>
<td>125AB</td>
</tr>
<tr>
<td>1:15 pm – 2:45 pm</td>
<td>PLATFORM SESSIONS–FRI-2</td>
<td>18 concurrent sessions</td>
</tr>
<tr>
<td>1:15 pm – 2:15 pm</td>
<td>Graduate School Part II: You’re in Graduate School, Now What!</td>
<td>124AB</td>
</tr>
<tr>
<td>1:15 pm – 2:45 pm</td>
<td>Curricular Innovation: Highlighting Your Most Unique or Innovative Course Offerings</td>
<td>122C</td>
</tr>
<tr>
<td>1:15 pm – 2:45 pm</td>
<td>International Symposium on Biomedical Engineering</td>
<td>122A</td>
</tr>
<tr>
<td>1:30 pm – 4:30 pm</td>
<td>BMES-NSF Special Session on CAREER and UNSOLICITED Awards</td>
<td>121ABC</td>
</tr>
<tr>
<td>1:45 pm – 3:15 pm</td>
<td>BMES Undergraduate Student Design Competition</td>
<td>128AB</td>
</tr>
<tr>
<td>2:45 pm – 3:30 pm</td>
<td>BMES Careers in Industry II</td>
<td>124AB</td>
</tr>
<tr>
<td>2:45 pm – 3:30 pm</td>
<td>POSTER VIEWING WITH AUTHORS &amp; Refreshment Break</td>
<td>North 300</td>
</tr>
<tr>
<td>3:00 pm – 4:00 pm</td>
<td>BMES Membership Committee Meeting</td>
<td>127C</td>
</tr>
<tr>
<td>3:00 pm – 5:00 pm</td>
<td>INDUSTRY SESSION Investment Pitches and Partnering</td>
<td>125AB</td>
</tr>
<tr>
<td>3:30 pm – 5:00 pm</td>
<td>PLATFORM SESSIONS–FRI-3</td>
<td>18 concurrent sessions</td>
</tr>
<tr>
<td>3:30 pm – 5:00 pm</td>
<td>Symposium in Honor of Dr. and Mrs. Athanasiou</td>
<td>122A</td>
</tr>
<tr>
<td>3:30 pm – 4:30 pm</td>
<td>Design Competition Judges</td>
<td>126A</td>
</tr>
<tr>
<td>5:15 pm – 6:15 pm</td>
<td>PLENARY SESSION Diversity Plenary Lecture</td>
<td>North Ballroom BCD</td>
</tr>
<tr>
<td>6:30 pm – 8:30 pm</td>
<td>University Receptions (affiliate event)</td>
<td>Sheraton Grand Phoenix</td>
</tr>
<tr>
<td>8:30 pm – 10:30 pm</td>
<td>BMES DESSERT BASH</td>
<td>Arizona Science Center</td>
</tr>
</tbody>
</table>

### SATURDAY | OCTOBER 14, 2017

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>7:00 am – 2:00 pm</td>
<td>Registration</td>
<td>Convention Center</td>
</tr>
<tr>
<td>8:00 am – 9:30 am</td>
<td>PLATFORM SESSIONS–SAT-1</td>
<td>17 concurrent sessions</td>
</tr>
<tr>
<td>8:00 am – 9:30 am</td>
<td>Undergraduate Research, Design &amp; Leadership Orals #1</td>
<td>226C</td>
</tr>
<tr>
<td>8:00 am – 9:30 am</td>
<td>BMES-NSF Special Session on Graduate Research Fellowships Program</td>
<td>121ABC</td>
</tr>
<tr>
<td>9:00 am – 10:00 am</td>
<td>AEMB Public Policy Session—How to Advocate for Biomedical Research Funding (affiliate event)</td>
<td>123</td>
</tr>
<tr>
<td>9:30 am – 1:30 pm</td>
<td>Exhibit Hall Open</td>
<td>North 300</td>
</tr>
<tr>
<td>9:30 am – 1:00 pm</td>
<td>POSTER SESSION</td>
<td>North 300</td>
</tr>
<tr>
<td>9:30 am – 10:15 am</td>
<td>POSTER VIEWING WITH AUTHORS &amp; Refreshment Break</td>
<td></td>
</tr>
<tr>
<td>10:30 am – 1:45 am</td>
<td>PLENARY SESSION Rita Schaffer Young Investigator Lecture &amp; Student Award Winners</td>
<td>North Ballroom BC</td>
</tr>
<tr>
<td>11:45 am – 1:15 pm</td>
<td>Lunch on Own</td>
<td></td>
</tr>
<tr>
<td>12:30 pm – 3:30 pm</td>
<td>BMES Board of Directors Meeting</td>
<td>126BC</td>
</tr>
<tr>
<td>1:30 pm – 3:00 pm</td>
<td>PLATFORM SESSIONS–SAT-2</td>
<td>17 concurrent sessions</td>
</tr>
<tr>
<td>1:30 pm – 3:00 pm</td>
<td>Undergraduate Research, Design &amp; Leadership Orals #2</td>
<td>226C</td>
</tr>
<tr>
<td>3:15 pm – 4:45 pm</td>
<td>PLATFORM SESSION–SAT-3</td>
<td>11 concurrent sessions</td>
</tr>
<tr>
<td>3:15 pm – 4:45 pm</td>
<td>Undergraduate Research, Design &amp; Leadership Orals #3</td>
<td>226C</td>
</tr>
</tbody>
</table>

CC = Convention Center  SG = Sheraton Grand