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Future BMES Annual Meetings

October 22-25, 2014
San Antonio, Texas

October 7-10, 2015
Tampa, Florida

October 5-8, 2016
Minneapolis, Minnesota

October 11-14, 2017
Phoenix, Arizona

October 17-20, 2018
Atlanta, Georgia

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You too can invent the future of medicine. Visit us at booth 409 to learn more.
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# 2013 BMES Annual Meeting

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- Add presentations to a custom itinerary
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**AUTHOR INDEX**

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Thank you to our other supporters:

Grants have been provided by the National Institute of Biomedical Imaging and Bioengineering and the National Science Foundation for the BMES 2013 Annual Meeting.
Welcome to the 2013 Annual Meeting of the Biomedical Engineering Society! Our Annual Meeting is the premier event for the Society and the field to share the latest advances in biomedical engineering, generate new ideas, recognize achievements, promote career development, network among colleagues and help shape the future. This year’s theme, “Advancing Human Health and Well Being” encompasses the breadth of research and education biomedical engineers are involved in toward advancing human health and well being. I urge you to take full advantage of the excellent technical program, plenaries, special events and myriad opportunities for professional development and networking.

2013 marks the continuation of long-standing traditions and newly established programs to illuminate innovations, recognize achievements, celebrate diversity and develop future biomedical engineers. Coulter College, a training program focused on the translation of biomedical innovations, is in its second year of partnering with BMES. This year it will focus on preparing students for translational work, and teams selected from a national competition will participate in a two-day workshop. Following on the last year’s success of the first session dedicated to health disparities, this year, the session, “Health Disparities: Innovative Approaches to Improved Health,” includes speakers representing academia, professional organizations, industry and government.

Promoting the field through awards and other forms of recognition is one of the primary functions of a professional society. Our Awards and Town Hall Ceremony will take place Thursday evening and will include the induction of new BMES Fellows. The Pritzker Distinguished Lecture, Distinguished Achievement, Diversity and Rita Schaffer Young Investigator Lecture Awards will be presented during their respective plenary lectures. These plenaries offer attendees a deeper understanding of the research and activities on which the awards are based. The 2013 Diversity Award, for the first time will be given to an institution, Cornell University, in recognition of its efforts to recruit and retain a diverse student body in BME.

BMES has a strong record of inclusion and is committed to developing the careers of all of its members. Formal and informal career development opportunities are abundant throughout the meeting starting with a slate of student and early career sessions on career pathways offered on Thursday. The annual Career Fair on Friday afternoon is a major draw for those seeking job opportunities. Networking is an important vehicle for professional development and I encourage you to attend the Welcome Reception on Wednesday, University Receptions on Thursday, and the BMES Bash on Friday and to interact with colleagues throughout the meeting.

We are now over 6,700 members strong and the involvement of our members at the meeting and throughout the year will enable us to continue our unprecedented growth and development. Special thanks are due to Conference Chair, William Wagner, Program Chair, Gordana Vunjak-Novakovic, Vice Program Chair Suzie Pun, BMES Staff, NSF, NIH, our sponsors and our meeting attendees.

My very best wishes to you for an enjoyable and productive meeting!

Gilda Barabino, PhD
BMES President

Dean, Grove School of Engineering
City College of New York

Gilda A. Barabino, PhD
BMES President
Leadership in Biomaterials and Tissue Characterization

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Welcome to Seattle and the 2013 Annual Meeting of the Biomedical Engineering Society. We are fortunate to host the conference this year in a vibrant city matching the vibrancy of our membership and the Society. For those of you who have attended recent BMES meetings, I hope you will find this year’s version builds on the momentum of previous years’ gatherings and captures the breadth and depth of our rapidly advancing field.

For their tireless efforts in assembling a world-class program, I would like to personally thank Gordana Vunjak-Novakovic and Suzie Pun, who serve as Program Chair and Vice Program Chair, respectively. For each of the tracks, too numerous to mention here, the track chairs deserve our gratitude for successfully guiding the peer review process and making the tough decisions needed to fit many excellent abstract submissions into the time and space constraints necessary for our meeting. Finally, I would like to express my personal thanks to the 2013 annual meeting team and the terrific support provided by the BMES staff, particularly the efforts of Debby Tucker and Ed Schilling. This is the first year for BMES where the meeting has been organized by a team not specifically linked to an institution in the host city, and with the professional support of the BMES staff, the organizational efforts have progressed smoothly and efficiently.

While attending the meeting I hope you will take full advantage of all the program has to offer in terms of scientific presentations, both oral and in poster format. With our society having grown to its current size, we are removed from the days I recall when the meeting was held on a host university campus and getting to the right session did not involve making such tough choices between so many relevant concurrent tracks. Please do find time to visit the exhibitors where you will find many of the leading biomedical engineering academic programs represented, along with publishers, suppliers for your research efforts, potential employers, and a variety of biomedically related non-profit organizations. The annual meeting also provides a wonderful opportunity for catching up with colleagues and networking. In addition to the opportunities between the sessions and at the receptions, many of the universities are holding evening receptions by invitation, but I believe you will find most are happy to offer an invitation if asked. Of course, the BMES Bash at the EMP museum is not to be missed.

Speaking of the EMP museum, the structure is a destination in itself. Designed by Frank O. Gehry with his trademark use of unexpected organic forms and scaled metallic skins, biomedical engineers might find here the work of a kindred spirit. Gehry is said to have sought his inspiration for the design in rock and roll, listening to Jimmy Hendrix, and visiting a local music shop to purchase electric guitars. He cut the electric guitars into pieces and reassembled them as building blocks in exploring novel forms to stimulate and advance his design. The result is a space interacting with the visitor in a unique fashion depending upon both their perspective and ambient conditions. Maybe Jimmy Hendrix isn’t a universal muse for biomedical engineering creativity, but in Frank Gehry’s approach one can see elements of our own approaches to understand fundamental elements in the body and to re-assemble, to create and to engineer with these building blocks new designs meeting our society’s objective: to “advance human health and well-being”.

Enjoy the BMES experience in Seattle!

William R. Wagner, PhD
BMES 2013 Annual Meeting Chair
Hello to the 2013 BMES! This year’s meeting of the Biomedical Engineering Society is being held in Seattle Washington on September 25-28, 2013, with the overall theme “Advancing human health and well being.” It has been my privilege to serve as a program chair of this largest national meeting for our field that is now experiencing an exciting time of rapid growth. The city of Seattle, a home of one of the nation’s finest universities and a dynamic hub for biotechnology and entrepreneurship is a perfect location for this year’s meeting. With a world-class team of track chairs, session chairs and presenters, we have assembled an outstanding program featuring three and a half days of platform and poster presentations, special sessions and social events.

The main program has nineteen tracks, many of which represent our traditional areas of strength and interest: Bioinformatics, computational and systems biology; Biomaterials; Biomedical engineering education; Biomedical imaging and optics; Cancer technologies; Cardiovascular engineering; Cellular and molecular bioengineering; Nano and micro technologies; Neural engineering; New frontiers and special topics; Orthopaedic and rehabilitation engineering; Stem cell engineering; Tissue engineering; Translational biomedical engineering; Undergraduate research. Four main additions to this year’s program are, by popular demand: Biomechanics; Device technologies and biomedical robotics; Drug delivery; and Respiratory bioengineering. These important areas of work have grown considerably in recent years and we felt each of them needs to be a separate track. We are also introducing an opening presentation for each track, by a leader in the field.

This year’s plenary lectures will be given by Dr Ashutosh Chilkoti from Duke University receiving the Pritzker Award, Sue Van from The Wallace H. Coulter Foundation receiving the BMES Distinguished Achievement Award, the Faculty, Department of Biomedical Engineering, Cornell University receiving the BMES Diversity Award, W. Mark Saltzman from Yale University giving the NIH NIBIB lecture, and Susan Thomas receiving the Rita Schaffer Young Investigator Lecture Awards. The program includes 831 oral presentations in 178 abstracts for Student Research & Design Awards and 300 Undergraduate abstracts exceeding 2,200. In addition, we have received 172 extended abstracts for Student Research & Design Awards and 300 Undergraduate Research Abstracts. The program includes 831 oral presentations in 178 platform sessions, and 1,544 poster presentations with poster viewing with the authors at designated times.

This year’s meeting is a result of collective effort of many people. The program has been developed in close collaboration with two most wonderful colleagues: the conference chair William Wagner and program vice-chair Suzie Pun. Throughout the process, we have had unparalleled expert support of Debby Tucker and Ed Schilling, and invaluable advice from the BMES leadership, the program committee and many of our colleagues. My special thanks go to the track chairs, who have invested a lot of creative effort into building a remarkably strong and interesting program. I also thank our reviewers for maintaining the standards of excellence in selecting the abstracts and posters, and all session chairs and presenters for making this year’s meeting a very special event.

Gordana Vunjak-Novakovic, PhD
Program Chair, BMES 2013 Annual Meeting
I am excited to welcome you to Seattle, Washington, for the 2013 Annual BMES meeting.

This year’s conference, like past years, has something for everyone. In addition to the outstanding programming prepared by our Program Chair, Gordana Vunjak-Novakovic, we will have special sessions for all career stages: undergraduate poster sessions, career workshops, the Meet the Faculty Candidate Forum, and an ABET workshop, to name a few. With our close proximity to Asia-Pacific, we have also initiated a Korea-US Joint Workshop on BME. This year, we are also especially enthusiastic about including a “kick-off” invited speaker in each of our 18 research tracks.

I hope you have a chance to get to know Seattle during your visit here. Pike Place Market, Seattle Center, the first Starbucks, the Art Museum, and the Seattle Central Public Library, with its award-winning architecture, are all in close proximity to the conference center. If you venture out a little further, you can enjoy the eccentric Seattle Underground Tour, the Hiram M. Chittenden Locks and Salmon Ladder, and you might even stumble upon a giant troll living under a bridge in Fremont.

Seattle is not only a special place but also a wonderful fit for the Biomedical Engineering Society meeting with both its history and ongoing contributions to the biomedical field. The Fred Hutchinson team led by Dr. E. Donnall Thomas developed the bone marrow transplantation procedure for treating cancer. In true biomedical engineering spirit, the Scribner Shunt, a breakthrough device used in kidney dialysis, was invented through collaboration between Dr. Belding Scribner, a University of Washington renal specialist, and Wayne Quinton, a UW engineer. In the pharmaceutical field, biologic drugs Enbrel (by Immunex, now Amgen) and Adcetris (by Seattle Genetics) were developed in Seattle.

In addition to the University of Washington, Seattle is home to three research hospitals, the Bill and Melinda Gates Foundation and over a dozen renowned research institutes, including the Fred Hutchinson Cancer Research Center, Institute for Systems Biology (ISB), Allen Brain Institute, the Program for Appropriate Technologies for Health (PATH), the Infectious Disease Research Institute (IDRI) and Seattle Biomedical Research Institute (SBRI).

If you’d like to know more about Seattle or biomedical research in this area, just ask one of the University of Washington representatives attending the conference in their purple shirts. It would be our pleasure to talk with you.

It has been a true pleasure working with the great leadership duo, Bill Wagner and Gordana Vunjak-Novakovic, in planning this conference. The BMES Staff has been instrumental in planning and promoting this meeting. I am especially grateful to Meetings Director Debby Tucker for her tireless work and her can-do attitude that has been critical in preparing for this meeting. Also, I am much indebted to the Track Chairs, Session Chairs and reviewers who provided their expertise and generous service to make this meeting a reality.

See you at the meeting!

Suzie Hwang Pun, PhD
Vice Program Chair, BMES 2013 Annual Meeting
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- pursuing post-doctoral work

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- **During/After Ph.D**: Engaging in a culminating experience by conducting research to foster career opportunities and/or link the U.S. and international BME communities.
- **Post-Doctoral**: Pursuing pre-professional post-doctoral work at a leading overseas institution.
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Solving Drug Delivery Problems by Genetically Engineered Polypeptides

This talk will focus on the power and versatility of genetic engineering to develop molecularly engineered drug delivery systems. This talk will highlight two orthogonal designs of genetically encoded peptide polymers—nanoparticles and gels—for drug delivery in two different therapeutic arenas—cancer and type-2 diabetes. In the first example, I will discuss a general method, attachment-triggered self-assembly of recombinant peptide polymers that packages small hydrophobic molecules into soluble polymer nanoparticles. Because many cancer chemotherapeutics are insoluble small molecules with poor bioavailability, this approach has great utility to increase the solubility, plasma half-life and tumor accumulation of many cancer chemotherapeutics.

The second half of the presentation will focus on the delivery of peptide drugs, as they are an exciting class of pharmaceuticals currently in development for the treatment of a variety of diseases; however, their main drawback is a short half-life, which dictates multiple and frequent injections. In the second example, I will discuss a range of injectable delivery systems based on thermally sensitive polypeptides for the sustained and tunable release of peptide and protein drugs from a subcutaneous injection site, one of which—Protease Operated Depot (POD)—provides the first molecularly engineered alternative to polymer microsphere technology for peptide delivery.

Ashutosh Chilkoti is the Theo Pilkington Professor of Biomedical Engineering at Duke University and has secondary appointments in Mechanical Engineering and Materials Science and Chemistry. He is currently the Director of the Center for Biologically Inspired Materials and Materials Systems at Duke University. Chilkoti received his degrees in Chemical Engineering (B. Tech, Indian Institute of Technology, Delhi, 1985 and Ph.D., University of Washington, Seattle, 1991) and has been a faculty member at Duke University since January, 1996. Chilkoti’s Bioengineering research explores the interaction between biological and synthetic polymers with biology at the molecular level, with the goal of developing molecular tools and devices for medicine and biotechnology. His work in Biomolecular Engineering focuses on genetically engineered stimulus responsive biopolymers as tools for protein separation, bioconjugation and drug delivery. In a complementary area of research in Biointerface Science, he focuses on the development of clinical diagnostics and plasmonic biosensors. He has co-authored over 250 publications and has more than 70 patents and patent applications. He is the founder of two start-up companies; PhaseBio Pharmaceuticals that has raised $65 million in venture capital funding and has taken the drug delivery technology that he developed into a Phase 2b clinical trial for sustained delivery of a peptide drug and Phase 1 clinical trials for two other drugs. A second, more recent venture, Sentilus Inc., is commercializing a point-of-care diagnostic based on a polymer brush technology developed in his laboratory.

He received the CAREER award from the National Science Foundation in 1998, the 3M non-tenured faculty award in 2002, and the Distinguished Research Award from the Pratt School of Engineering at Duke University in 2003 and in 2005. He was the recipient of a senior researcher award from the Alexander Von Humboldt Foundation in 2010, and the Clemson Award for Contributions to the Literature from the Society for Biomaterials in 2011. He was elected fellow of the Controlled Release Society and the Biomedical Engineering Society in 2013. He serves on the Editorial Board of five journals.
THE WALLACE H. COULTER Foundation was established in 1998 by its benefactor, Wallace Coulter, founder and Chairman of Coulter Corporation. The Foundation continues Wallace’s practice of providing risk capital for innovative initiatives through its grant programs. The largest of these promotes academic translational research based in biomedical engineering. By implementing industry best practices, this process accelerates the translation of promising technologies into practical advances improving patient care. The Foundation’s second largest program collaborates with leading medical societies to bring the latest education and standards of care to resource-limited countries. The third program of the Foundation focuses on building a consortium amongst Asian American organizations to establish one cohesive community to promote collaboration and partnership. Finally, the Foundation supports educational and humanitarian initiatives related to the legacy and values of Mr. Coulter.

As Trustee, Ms. Van has fiduciary responsibility for the vision, strategic plan and operations of the Foundation. She is integrally involved in every aspect of its programs, from creation to implementation and establishing the metrics for success.

Sue Van, CEO and President of the Wallace H. Coulter Foundation, brings an industry perspective to the value biomedical engineering programs and their graduates bring to the medical device and life science industries.

Her perspective comes from more than 30 years as a board member and the chief financial officer of the diagnostics company, the Coulter Corporation. At Coulter she participated in hundreds of funding decisions for R&D projects.

Prior to establishing the Foundation, Sue was the Executive Vice President, Chief Financial Officer and Treasurer of Coulter Corporation, a leading global diagnostics company. In this capacity, she was responsible for the company’s long-term strategy, as well as its financial and legal affairs. Working for a privately held company posed both opportunities and challenges. Sue converted leasing from a domestic financing tool to a global marketing strategy insuring market dominance. She negotiated the purchase of Japan Scientific (JSI) in the first ever leveraged buyout of a Japanese company by a foreign entity. In 1991, Sue managed the purchase and consolidation of the company from over 30 buildings across south Florida to its new corporate headquarters.

During her years in the medical technologies industry, Ms. Van witnessed a disconnect in the communication between engineers, researchers, marketers, manufacturers and services professionals, costing precious time and millions of dollars. The different and narrow backgrounds of these professionals often led to miscommunications and delays in developing important medical technologies.

Ms. Van believes biomedical engineers are best positioned to solve these communication problems. She believes biomedical engineers are best suited to assume a multitude of positions in medical technology companies, and are poised to lead teams—and the whole industry—in improving the lives of patients.

Sue was born in Shanghai, China, and immigrated to the United States at the age of five. She is the eldest of seven siblings. Her pursuit of lifelong learning was instilled by her parents, neither of whom had the opportunity for a formal education. Sue earned a B.A. in Political Science from American University, an M.A. in International Affairs from George Washington University, and is a CPA.
Drug Delivery: Engineering to Overcome Obstacles

The field of drug delivery is important to the future of public health. Biomedical engineers are uniquely qualified to contribute to this effort: progress depends, for example, on the synthesis of biomaterials with tailored properties and the design of controlled release and targeted delivery vehicles. I received my first NIH grant to study drug delivery in 1990: following good advice from mentors, the budget was low and the ambition was high. For that work, we proposed to engineer delivery systems that would release antibodies topically in the female reproductive tract, providing long-term protection against STDs and unwanted pregnancy. Our work led us in some directions that we anticipated: we described our first system for long-term protection against HSV-2 genital infections in 1996. But our instincts as biomedical engineers also led us to explore approaches that we could not have anticipated at the time, including vehicles that carry drugs past tissue barriers and nanoparticles for intracellular delivery of potent agents. The skills that we teach in biomedical engineering classrooms and laboratories are powerful tools in the effort to improve drug delivery.

W. Mark Saltzman is an engineer and educator. Dr. Saltzman’s research in the fields of drug delivery, biomaterials, nanobiotechnology, and tissue engineering is described in over 200 research papers and 15 patents. He is the author of three textbooks: Biomedical Engineering (2009), Tissue Engineering (2004), and Drug Delivery (2001).

The grandson of Iowa farmers, Mark Saltzman earned degrees in chemical engineering (B.S. Iowa State University 1981 and M.S. MIT 1984) and medical engineering (Ph.D. MIT 1987). He served on the faculty at Johns Hopkins (1987-1996), Cornell (1996-2002), where he was the first BP Amoco/H. Laurance Fuller Chair, and Yale, where he has been the Goizueta Foundation Professor since 2002. He became the founding chair of the Yale’s Department of Biomedical Engineering in 2003.

Dr. Saltzman has been recognized for his excellence in research and teaching. He received the Camille and Henry Dreyfus Foundation Teacher-Scholar Award (1990); the Allan C. Davis Medal (1995); the Controlled Release Society Young Investigator Award (1996); and the Professional Progress in Engineering Award from Iowa State University (2000). He has been elected a Fellow of the American Institute for Medical and Biological Engineering (1997); a Fellow of the Biomedical Engineering Society (2010); and a Member of the Connecticut Academy of Science & Engineering (2012). He has delivered over 200 invited lectures including the Britton Chance Distinguished Lecture at the University of Pennsylvania (2000) and the Distinguished Lecture of the Biomedical Engineering Society (2004).

Dr. Saltzman has taught dozens of college courses including Heat & Mass Transfer, Material & Energy Balances, Introduction to Biomedical Engineering, Drug Delivery & Tissue Engineering, Physiological Systems, and Molecular Transport & Intervention in the Brain. His course Frontiers of Biomedical Engineering is available to everyone through Open Yale Courses (http://oyc.yale.edu).
Techno-Stories from Space

Frontiers are interesting places; they offer possibilities to make observations outside our normal range of experience. The International Space Station is such a frontier offering a reduction in acceleration forces by nearly a factor of a million. This allows the observation of subtle phenomena that are typically masked on Earth. This orbital vantage also allows observation of Earth phenomena on the length scale of half a continent. A smattering of my observations will be presented. There will be many questions and few answers, which of course is a characteristic of being on a frontier and why we venture there.

Dr. Pettit received a Bachelor of Science in Chemical Engineering from Oregon State University in 1978 and a Doctorate in Chemical Engineering from the University of Arizona in 1983.

Pettit was a staff scientist at Los Alamos National Laboratory from 1984 to 1996. Projects included reduced gravity fluid flow and materials processing experiments onboard the NASA KC-135 airplane, atmospheric spectroscopy on noctilucent clouds seeded from sounding rockets, fumarole gas sampling from volcanoes and problems in detonation physics.

He was a member of the Synthesis Group, slated with assembling the technology to return to the moon and explore Mars and the Space Station Freedom Redesign Team.

A veteran of three spaceflights, Dr. Pettit has logged more than 370 days in space and over 13 EVA (spacewalk) hours. He lived aboard the International Space Station for 5-1/2 months during Expedition 6, was a member of the STS-126 crew, and again lived aboard the station for 6-1/2 months as part of the Expedition 30/31 crew.

Dr. Pettit completed his first spaceflight as a NASA International Space Station Science Officer aboard the station, logging more than 161 days in space, including over 13 EVA hours. During their 5-1/2 months aboard the ISS, the crew worked with numerous U.S. and Russian science experiments. Dr. Pettit and Mission Commander Ken Bowersox performed two EVAs to continue the external outfitting of the orbital outpost.
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Fluid Biotransport in Immunity and Immunotherapeutic Design

IMMUNE DYSFUNCTION UNDERLIES the pathogenesis of a multitude of human diseases. Immunoengineering, or the application of engineering principles to the characterization of immune physiology and development of immunomodulatory therapeutics, is therefore of emerging interest. Tissue fluid imbalance commonly accompanies disease-associated inflammation, implicating an underlying vascular involvement. While the lymphatic vasculature is historically overlooked as a passive conduit system, fluid drainage mediated by lymphatics facilitates the transport of cells and biomolecules from peripheral tissues to draining lymph nodes and into the systemic circulation. We have demonstrated a crucial role for lymphatic-mediated transport in the fine-tuning of humoral immunity and immune tolerance, providing insight into how fluid homeostasis regulates local tissue immune status. This suggests that lymphatic-mediated fluid, molecular and cellular transport processes might be exploited in immunotherapy applications, such as in sentinel lymph node-targeted cancer therapy, as one example.

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

SUSAN N. THOMAS is an Assistant Professor in the George W. Woodruff School of Mechanical Engineering at the Georgia Institute of Technology. She is also program faculty in the Wallace H. Coulter School of Biomedical Engineering at Georgia Tech and Emory University and a member of the Winship Cancer Institute of Emory University. Dr. Thomas received her B.S. cum laude in Chemical Engineering from the University of California Los Angeles in 2003. She received her Ph.D. in 2008 from The Johns Hopkins University while working as a National Science Foundation Graduate Research Fellow in the Chemical & Biomolecular Engineering Department under the supervision of Konstantinos Konstantopoulos where she studied the influence of fluid flow on blood-borne metastasis. Subsequently, she was a Whitaker Postdoctoral Scholar at École Polytechnique Fédérale de Lausanne (one of the Swiss Federal Institutes of Technology) in the laboratories of Melody Swartz and Jeffrey Hubbell developing nanomaterials for cancer immunotherapy and studying the role of lymphatic transport in immunity. At Georgia Tech she continues to investigate the role of biotransport processes in regulating immune-regulated pathologies, in particular cancer, and the development of biomaterial-based strategies for immunomodulation.
Increasing Opportunities Throughout the STEM Pipeline Through Coordinated Efforts in an Academic Department

In an increasingly technology-oriented global economy, it is essential for the United States to increase the gender and racial diversity of individuals entering science, technology, engineering, and mathematics (STEM) careers. The current demographics of the STEM workforce represent an unfortunate waste of human potential and are the result of barriers and discouragement at all levels of the educational system. While breaking down these barriers requires the work of individual teachers and mentors, the impact of these efforts can be dramatically multiplied if there is a broader commitment across an organization.

The Biomedical Engineering department at Cornell University has involved all faculty members in efforts to increase opportunities for diverse students in STEM fields, generally, and biomedical engineering, specifically. These efforts target students throughout the educational system, including middle and high school, undergraduate, graduate, and early professional levels. Through this work, the department has created a culture of diversity that sustains and amplifies itself, enabling the training of future STEM professionals who are not only diverse themselves, but who also value diversity and can succeed in promoting it.

The Department of Biomedical Engineering at Cornell University was founded in 2004 with the vision that a quantitative understanding of the human body can be used as a foundation for the rational design of therapies, devices, and diagnostic procedures to improve human health. The department currently has 15 faculty; its extensive graduate field includes 42 additional faculty in other departments who participate in training graduate students. Its primary research focus is in five areas: Biomaterials and Drug Delivery; Biomedical Imaging; Biomedical Mechanics; Micro- and Nanobiotechnology; and Molecular, Cell, and Tissue Engineering. The department has strong relationships with clinical collaborators in the College of Veterinary Medicine in Ithaca, NY, and Weill Cornell Medical College in New York City. Its faculty are leaders in the Center for the Microenvironment and Metastasis, a trans-campus U54 center supported by the National Cancer Institute. Its graduate program currently enrolls 104 PhD students and 108 Masters of Engineering students. A plan for an undergraduate program is currently under development, with the goal of offering the Bachelor of Science degree in the near future.
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The Boston University 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, MEng, MS and PhD degree programs, which are known for their highly quantitative approach. We have strengths in numerous research areas including biomechanics, neural engineering, biomedical optics, respiratory dynamics, tissue engineering, biomaterials and synthetic biology. We boast a wealth of research resources, and have strong ties with the BU School of Medicine, and other top medical research centers in the Boston area.
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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.
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. Cutting-edge research thrusts include: biomaterials and tissue engineering, neural engineering and neuroprostheses, biomedical imaging and sensing, transport and metabolic engineering, biomechanics, and targeted therapeutics.

The City College of New York – the founding college of CUNY. Founded in 1847, it has produced nine Nobel Prize winners and ranks seventh in the number of alumni who have been elected to the National Academy of Sciences. The Biomedical Engineering Department was established in 2002. BME at CCNY: Biomaterials/nanotechnology; Cardiovascular Engineering; Musculoskeletal Biomechanics; and Neural Engineering.

The Department 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 Department has a close relationship with Weill Cornell Medical College and its associated hospitals in New York City, including an "Immersion Term" during which all Ph.D. students spend 7 weeks in a clinical experience at the Medical College. Cornell University is a comprehensive university with outstanding programs of teaching and research in all areas of human inquiry which has its main campus at Ithaca in the Finger Lakes Region of upstate New York. A new Engineering campus is opening in New York City located on a site less than 20 minutes from the Medical College and its associated hospitals in New York City, including an "Immersion Term" during which all Ph.D. students spend 7 weeks in a clinical experience at the Medical College. Cornell University is a comprehensive university with outstanding programs of teaching and research in all areas of human inquiry which has its main campus at Ithaca in the Finger Lakes Region of upstate New York. A new Engineering campus is opening in New York City located on a site less than 20 minutes from the Medical College which will catalyze further growth in the Department's interactions with the Medical College and hospitals. The Biomedical Engineering Department has close collaborations with a wide variety of other departments in Ithaca, especially with those in the Colleges of Engineering, Veterinary Medicine, Agriculture and Life Sciences, Arts and Sciences, and Human Ecology.

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The City College of New York – the founding college of CUNY. Founded in 1847, it has produced nine Nobel Prize winners and ranks seventh in the number of alumni who have been elected to the National Academy of Sciences. The Biomedical Engineering Department was established in 2002. BME at CCNY: Biomaterials/nanotechnology; Cardiovascular Engineering; Musculoskeletal Biomechanics; and Neural Engineering.

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The Department of Biomedical Engineering at Florida International University (FIU) in Miami is the only department in the State University System of Florida offering BS (accredited) through PhD degrees as well as a BS/MS and BS/MS in Engineering Management. Established in 2004, the doctoral program has benefitted from the steady expansion of the FIU research enterprise which had one of the largest increases in ranking in federal research and expenditure over the last decade. The department is investing extensively in: Basic Research in Engineered Tissue Model Systems, Diagnostic Bioimaging and Sensor Systems, and Therapeutic and Reparative Neurotechnology. The department has expanding industrial ties and is closely linked with FIU’s new College of Medicine.

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Email: th.webster@neu.edu
Web: www.webster-nano.com

Northeastern University offers M.S. and Ph.D. degrees in Bioengineering in the heart of Boston’s rich clinical, entrepreneurial, and academic environments. Unique strengths include Northeastern’s internationally renowned experiential classroom-based education and Cooperative (Co-op) Education Program allowing students to closely work with industry while completing their undergraduate or graduate degrees. Research areas of strength include biomaterials, tissue engineering, neuroscience, biomechanics, nanotechnology, drug delivery, imaging, and many more. Please contact Dr. Thomas J. Webster (th.webster@neu.edu, Department Chair of Chemical Engineering) to learn why Northeastern has consistently been listed among the top “up-and-coming national universities” by the U.S. News and World Report.

Northwestern University
2145 Sheridan Road
Evanston, IL 60026
Phone: 847-467-2369
Email: s-oldts@northwestern.edu
Web: www.bme.northwestern.edu

With cutting-edge research in Cell and Molecular Engineering, Biomaterials and Biointerfaces, Imaging and Biophotonics, Neural Engineering and Rehabilitation, Northwestern University BME attracts top faculty and students alike. Research takes place on the main campus in Evanston and on the medical school campus in downtown Chicago.
The Ohio State University

DEPARTMENT OF BIOMEDICAL ENGINEERING
270 Bevis Hall, 1080 Carmack Road
Columbus, OH 43210
Phone: 614-292-7152
Email: bmegrad@osu.edu
Web: www.bme.osu.edu

Offering B.S., M.S., Ph.D., and M.D./Ph.D. degree options, researchers in biomechanics/biotransport; biomaterials; bioimaging; molecular, cellular, tissue engineering; biomedical devices, instrumentatation and micro/nanotechnology collaborate campus-wide. State-of-the-art facilities include the Davis Heart and Lung Research Institute, Nanotech West, Ohio Supercomputing Center, Children’s Hospital of Columbus, and The Ohio State University Wexner Medical Center.

Peking University

DEPARTMENT OF BIOMEDICAL ENGINEERING
No.5 Yi Heyuan Road, Hai Dian district
Beijing 100871 China
Phone: +86 62767113
Email: pku_bme@coe.pku.edu.cn
Web: http://bme.pku.edu.cn/en/

As one of the fastest developing units of Peking University, the Biomedical Engineering Department focuses on various researches including medical instruments and imaging, regenerative medicine, and computational medicine. The department has also established wide international collaborations, and it is a partner of Georgia Tech/Emory University on both education and research.

Pennsylvania State University

DEPARTMENT OF BIOENGINEERING
206 Hallowell Building
University Park, PA 16802
Phone: 814-865-1407
Email: mj436@engr.psu.edu
Web: www.bioe.psu.edu

Offering B.S., M.S. and Ph.D. programs in Bioengineering, our mission is to educate students to become world-class engineers who contribute to social and economic development through innovative solutions to problems in medicine and the life sciences. Our uniquely trained faculty and specialized facilities enable cutting-edge research in fundamental biology, medical device design, and disease diagnosis, with a goal to translate discovery from academia to society. Come by for a visit. We look forward to meeting you!

Rensselaer Polytechnic Institute

Rensselaer Polytechnic Institute is the nation’s oldest technological research university and home to one of the oldest biomedical engineering departments. Educating outstanding academics, industry leaders and research scientists. Research is centered on Biomolecular Science and Engineering, Biomedical Imaging, Musculoskeletal Engineering, Neural Engineering, Systems Biology and Biocomputation, and Vascular Engineering (bme.rpi.edu).

Rutgers University

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, bionanotechnology, biomechanics, rehabilitation engineering, and biomedical imaging.
Bioengineering is revolutionizing 21st century healthcare worldwide. But to have the greatest impact, the best minds have to work together across a variety of fields. At the University of Illinois, that interdisciplinary attitude and the desire to deliver safe, effective, affordable medical technologies drive us. They’ve led to breakaway work in imaging, biosensing, cellular mechanics, and biophysics. Now we’re expanding our team. Thanks to the $100 million Grainger Engineering Breakthroughs Initiative, we’re creating more than 35 new endowed professorships and chairs in Bioengineering and other fields. If you’re ready to drive the future of Bioengineering, Illinois is the place for you.

GraingerInitiative.engineering.illinois.edu
BOOTH # 523

Sawbones Worldwide
10221 SW 188th Street
Vashon, WA 98070
Phone: 206-463-3551
Email: amy@pacific-research.com
Web: www.sawbones.com

SAWBONES WORLDWIDE is the leader in orthopaedic and medical education models. Our models are widely used in classrooms and laboratories as hands-on teaching aids. They also offer a range of biomechanical test materials designed to simulate the physical properties of human bone without the variability or special handling requirements.

BOOTH # 522

Scientific Computing & Imaging (SCI) Institute and the Department of Bioengineering at the University of Utah
72 South Central Campus Drive
Salt Lake City, UT 84112
Phone: 801-585-1867
Email: sci-info@sci.utah.edu
Web: http://www.sci.utah.edu
http://www.bioen.utah.edu/

The Scientific Computing and Imaging (SCI) Institute has established itself as an internationally recognized leader in visualization, scientific computing, and image analysis. The SCI Institute’s overarching research objective is to create new scientific computing techniques, tools, and systems that enable solutions to problems affecting various aspects of human life. Visit us at our booth and join us for our BMES 2013 Track on Bioinformatics, Computational and Systems Biology. The theme of this year’s track is discovery from mathematical modeling of large-scale biomedical data, and it features a record eleven platform sessions and more than a hundred posters by researchers from sixteen countries.

BOOTH # 624

Temple University
BIOENGINEERING DEPARTMENT
1947 N. 12th Street
Philadelphia, PA 19122
Phone: 215-204-3883
Email: bioeng@temple.edu
Web: http://www.temple.edu/engineering

Beginning in the fall of 2012, the Department, located in approximately 20,000 ft.² of state-of-the-art of renovated research and educational lab and office space, is welcoming its first class of graduate students for Masters and PhD studies. The undergraduate curriculum will commence in the fall of 2013. Matriculating doctoral students receive financial support that includes a stipend, tuition remission and health insurance. Matriculating master’s degree students on the thesis option may be eligible for financial support. Current faculty expertise is focused on cell and regenerative tissue engineering, biomaterials and spectroscopy. Future faculty hires will focus on related areas such as Imaging, Neuroengineering, Bioinformatics and Medical Device Technologies, with a strong emphasis on interdisciplinary collaborations and translational research, leveraging strategic initiatives and institutional strengths in Medicine, Pharmacy, and Oncology.

BOOTH # 437

Springer
233 Spring Street
New York, NY 10013
Phone: 212-60-1500
Email: exhibits-ny@springer.com
Web: www.springer.com

Springer is the proud publishing partner of the BMES and a leading publisher in biomedical engineering. Please stop by our booth to browse our books and journals. Publishing editors will be on hand to answer any questions you might have about publishing with Springer.

BOOTH # 309

Texas A & M University
DEPARTMENT OF BIOMEDICAL ENGINEERING
3120 TAMU
College Station, TX 77843-4462
Phone: 979-845-5532
Email: bmen@tamu.edu
Web: http://engineering.tamu.edu/biomed

The Texas A&M Department of Biomedical Engineering offers an opportunity to participate in ground-breaking research in Biomedical Sensing and Imaging, Biomedical Optics, Cardiovascular Biomechanics, and Biomaterials. The outstanding faculty within this ABET-accredited department have strong collaborations with both medical and veterinary schools. Offering degree options at the bachelor’s (B.S.), master’s (M.S., M.Eng., M.Eng./MBA), and doctoral (Ph.D. & D.Eng.) level, the Department of Biomedical Engineering at Texas A&M provides an exceptional academic experience.
Tufts University

BIOMEDICAL ENGINEERING

4 Colby Street
Medford, MA 02155
Phone: 617-627-2580
Email: milva.ricci@tufts.edu
Web: www.tufts.edu

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

Tulane University

BIOMEDICAL ENGINEERING

500 Lindy Boggs Bldg.
New Orleans, LA 70118
Phone: 504-865-5897
Email: bmen-info@tulane.edu
Web: www.bmen.tulane.edu

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

The University of Akron

DEPARTMENT OF BIOMEDICAL ENGINEERING

Akron, OH 44325-0302
Phone: 330-972-6650
Email: bmegrad@uakron.edu
Web: www.uakron.edu/engineering/BME/

Biomedical Engineering began as a research institute at The University of Akron in 1980 and became an academic department in 1984. We offer two graduate degree programs: a masters degree in engineering with the biomedical specialization and Ph.D. in Engineering. These programs have an individualized curricular approach, designed in coordination with each student’s career plans. Our faculty are engaged in a variety of research areas, including but not limited to, instrumentation, biomaterials, biomechanics, and tissue engineering. BME faculty have active collaborations both on campus and with researchers in regional health care institutions and biomedical industry. We encourage interdisciplinary interactions to promote vibrant research activities and to provide exceptional scholarly atmosphere for learning. The BME Department currently has 18 full-time and joint faculty, including 8 recent hires, 3 endowed chairs, and 2 CAREER award recipients.
The Biomedical Engineering (BME) Graduate Program at The University of Alabama at Birmingham offers Master’s, PhD, and M.S.B.M.E. with Certificate in Life Sciences Entrepreneurship in collaboration with the School of Business. The BME Department has a strong record of interdisciplinary research with emphasis in the areas of biomaterials, biomechanics, biomedical imaging, cardiac electrophysiology, computational biology, drug delivery, tissue engineering and regenerative medicine. The BME Graduate Program has over 60 primary and secondary faculty training students to develop the next generation of technologies. BME graduates find employment in universities, health care, medical devices, pharmaceuticals, regulatory agencies, or computer application groups.

The University of Arizona’s Biomedical Engineering Graduate Interdisciplinary Program offers opportunities to integrate engineering, mathematics, biology, and medicine in a collaborative multi-disciplinary environment, with over 60 faculty mentors. Proximity to Medicine and Health Sciences colleges facilitates cutting-edge translational research in specialties such as cardiovascular engineering, imaging, nanotechnology, computational modeling, and entrepreneurship.

The Biomedical Engineering Program at the University of Arkansas offers MS and PhD degrees. Our active faculty has research programs in: Organ Regeneration; Cell and Molecular Imaging; Nanobiotechnology; Molecular Genetics and Cell Biology in Disease Prevention; Biomaterials; Tissue Engineering; and Vaccine and Immunotherapy Delivery Systems. Stop by our booth and learn how well qualified students can earn $10,000 to $20,000 per year on top of standard assistantship stipends!

With 33 primary faculty and a graduate group of ~70 faculty, BME at UC Davis combines exceptional teaching with state-of-the-art research to prepare students for careers in academics and industry. Come learn about our programs in bioinformatics, biomechanics, cellular and molecular systems, imaging, synthetic biology, and tissue engineering and regenerative medicine.

The University of Arizona

BIOMEDICAL ENGINEERING
P.O. Box 21240
Tucson, AZ 85721
Phone: 520-629-9134
Email: dhoward@email.arizona.edu
Web: www.bme.arizona.edu

The University of Arkansas at Birmingham offers Master’s, PhD, and M.S.B.M.E. with Certificate in Life Sciences Entrepreneurship in collaboration with the School of Business. The BME Department has a strong record of interdisciplinary research with emphasis in the areas of biomaterials, biomechanics, biomedical imaging, cardiac electrophysiology, computational biology, drug delivery, tissue engineering and regenerative medicine. The BME Graduate Program has over 60 primary and secondary faculty training students to develop the next generation of technologies. BME graduates find employment in universities, health care, medical devices, pharmaceuticals, regulatory agencies, or computer application groups.

The University of California at Davis

BIOMEDICAL ENGINEERING
One Shields Avenue
Davis, CA 95616
Phone: 530-752-1033
Email: bme@ucdavis.edu
Web: www.bme.ucdavis.edu

The Bioengineering Interdepartmental Graduate (BIG) program combines a solid fundamental foundation in biological science and engineering, and aims to equip the students with diverse communication skills and training in the most advanced quantitative bioengineering research so that they can become leaders in their respective fields. Students have the opportunity to interact with, not only their advisors, but continuously with the BIG Faculty in a host of academic settings. The result is a rigorous, but exceptionally interactive and welcoming educational training for BIG students.

The University of California at Irvine

DEPARTMENT OF BIOMEDICAL ENGINEERING
3120 Natural Sciences II
Irvine, CA 92697-2715
Phone: 949-824-9196
Email: nimondi@uci.edu
Web: www.bme.uci.edu

BME program at UCIrvine offers three technology focus areas (biophotonics, biomedical microsystems, and bioinformatics and modeling) and four clinical areas (cardiovascular, cancer, neurorehabilitation, ophthalmic). BME faculty lead six major research centers spanning from basic research to clinical translation. UCI is located in Orange County, home to more than 300 medical device companies.

The University of California at Riverside

DEPARTMENT OF BIOENGINEERING
MSE 217
3401 Watkins Drive
Riverside, CA 92521
Phone: 951-827-4303
Email: jennifer@engr.ucr.edu
Web: www.bioeng.ucr.edu

The Bioengineering Interdepartmental Graduate (BIG) program combines a solid fundamental foundation in biological science and engineering, and aims to equip the students with diverse communication skills and training in the most advanced quantitative bioengineering research so that they can become leaders in their respective fields. Students have the opportunity to interact with, not only their advisors, but continuously with the BIG Faculty in a host of academic settings. The result is a rigorous, but exceptionally interactive and welcoming educational training for BIG students.
University of Connecticut

BIOMEDICAL ENGINEERING
260 Glenbrook Road, Unit 3247
Storrs, CT 06269
Phone: 860-486-0163
Email: lisae@engr.uconn.edu
Web: www.bme.uconn.edu

The ABET-accredited Undergraduate program and the long-standing MS/PhD Program in Biomedical Engineering at the University of Connecticut are now under the auspices of the Biomedical Engineering Department, which spans the School of Engineering (Storrs) and the Schools of Medicine and Dental Medicine (Farmington), offering our students ready access to cutting-edge research and outstanding faculty members/practitioners on both campuses. We also offer one of the few Clinical Engineering Internship programs (MS) in the country.

University of Florida

J. CRAYTON PRUITT FAMILY DEPARTMENT OF BIOMEDICAL ENGINEERING
Biomedical Sciences Building JG-56
P.O. Box 116131
Gainesville, FL 32611-6131
Phone: 352-273-9222
Email: info@bme.ufl.edu
Web: www.bme.ufl.edu

UF BME is made possible by the vision and generosity of Dr. J. Crayton Pruitt and his family. Since its inception in 2002, the Department continues to excel in interdisciplinary research that merges engineering with biology and medicine. The Department offers both a graduate program and an undergraduate program (2012 inaugural class), with particular strengths in Neural Engineering, Imaging and Medical Physics, Biomaterials and Tissue Engineering, and Biomechanics and Modeling. In the past year, the Department has grown to 18 faculty and will continue that growth up to 25-27. UF BME is one of only a few departments in the nation to be co-located with a top-ranked medical school, veterinary school, and dental school. The Department is also uniquely positioned to contribute to clinical translation of biomedical technologies because of the outstanding resources for entrepreneurship and commercialization in the Gainesville area.

University of Illinois at Chicago

DEPARTMENT OF BIOENGINEERING
851 S. Morgan Street, Room 218
218 Science and Engineering Offices
Chicago, IL 60607
Phone: 312-996-2335
Email: bioe@uic.edu
Web: www.bioe.uic.edu

One of the first degree granting and accredited Bioengineering programs in the nation, since 1965 UIC Bioengineering offers B.S., M.S., Ph.D., and M.D./Ph.D programs that emphasize translational research and training, led by a core faculty that collaborates with leading faculty in five major academic medical centers in Chicago - including UIC, itself, home of the largest medical school in the country - and through innovative industry-linked education programs like Interdisciplinary Medical Product Development.

University of Illinois at Urbana-Champaign

DEPARTMENT OF BIOENGINEERING
1304 W. Springfield Avenue
Room 1270 Digital Computer Laboratory
Urbana, IL 61801
Phone: 217-333-1867
Email: bioengineering@illinois.edu
Web: www.bioengineering.illinois.edu

The Department of Bioengineering offers studies leading to the Master of Science in Bioengineering and the Doctor of Philosophy in Bioengineering. The Bioengineering Graduate Program provides students with educational and research experiences that integrate the sciences of biology and medicine with the practices and principles of engineering. Areas of focus include Bio-imaging, Cell & Tissue Engineering, Micro and Molecular Technologies, and Computational Biology. Opportunity also exists for specializing in (i) computational science and engineering and (ii) energy and sustainability engineering via the Computational Science and Engineering (CSE) Option and the Energy and Sustainability Engineering (EaSE) Option. The Medical Scholars Program permits highly qualified students to integrate the study of medicine with study for a graduate degree in a second discipline, including Bioengineering.
The University of Iowa Department of Biomedical Engineering offers graduate research programs in the following research areas: Biomedical Imaging, Biomaterials, Cardiovascular Biomechanics, Bioinformatics, Musculoskeletal Biomechanics, Tissue Engineering and Cellular Analysis. The Department is located close to a tertiary-care teaching hospital, and near the Colleges of Dentistry, Medicine, Nursing, Pharmacy and Public Health. Iowa City is ranked number 4 in the Top 10 College Destinations (AIER), is a UNESCO City of Literature, and is a Top 100 Adventure City (NatGeo Adventure). Stop by our booth for more information.

The University of Kansas 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.
Faculty and students in the Fischell Department of Bioengineering at UMD are committed to making a difference in human health care through education, research, and invention. We have exciting collaborations with the NIH-NCI, UMB Pharmacy and Medicine, and the FDA and offer programs leading to the BS, M.Eng., MS/MD, MD/PhD and PhD degrees.

U-M BME's newly formed joint department in the top-ranked Medical School and top-ranked College of Engineering will foster collaboration between engineers and physicians to accelerate discovery of healthcare technology.

With the support of the Wallace H. Coulter Translational Research Partnership Program, U-M BME embraces the translation of research into lifesaving technologies.

The BME design program consistently produces student teams that compete and win awards in design competitions on the national stage.

The University of Michigan Department of Biomedical Engineering provides an outstanding educational experience for engineers in biomedical engineering and develops future leaders in the field. The program’s primary emphasis is on biomedical engineering fundamentals, while allowing students to personalize their curriculum to prepare them for a wide variety of careers including biomedical engineering, law, medicine, and business.
The Department of Biomedical Engineering at the University of Minnesota is located at the intersection of the medical school, engineering, and physical sciences, in the heart of LifeScience Alley (home to Medtronic, Boston Scientific, St. Jude Medical, plus 500 other FDA-registered medtech companies). Research conducted by the faculty spans the full spectrum, with particular depth in cardiovascular/neural engineering, cell/tissue engineering, and biomedical imaging/optics.

The University of Pittsburgh Department of Bioengineering conducts world-class research and is home to faculty and students at both the graduate and undergraduate level who have won both nationally and internationally recognized awards. The department also has a close affiliation with the renowned University of Pittsburgh School of Medicine.
The Graduate Program in Biomedical Engineering at the University of Rochester provides training at the Masters and Doctoral level. Research covers a broad spectrum, ranging in length scale from molecular to whole animal, and encompassing a wide variety of physiological systems and experimental approaches. With access to over 50 laboratories on the River Campus and the adjacent Medical Center, students can tailor their own interdisciplinary and translational training experience. Multiple active centers and affiliated groups offer collaborative research in Biomedical Optics; Neuroengineering; Biomechanics; Medical Imaging; Biomaterials, Nanotechnology and Cell & Tissue Engineering.

The USC Viterbi School of Engineering’s top 10 ranked graduate program offers Master’s and Doctoral programs in a wide range of disciplines. Learn more about our unique programs, including Biomedical Engineering, Medical Imaging, Neuroengineering, Medical Devices and Wireless Health Technology at viterbi.usc.edu/gapp.
BOOTH # 524
University of South Carolina

BIOMEDICAL ENGINEERING
301 Main Street
Columbia, SC  29028
Phone: 803-777-5604
Email: mossme@cec.sc.edu
Web: www.biomed.engr.sc.edu

Our program is an interdisciplinary effort, jointly administered by Chemical and Mechanical Engineering and benefiting from collaboration with Computer Science, School of Medicine, and Public Health. With the benefit of two major NSF grants we have built research programs in biomaterials, biomechanics, nanofluidics, cellular and tissue engineering, and biomolecular engineering.

BOOTH # 608
University of Texas at Arlington

BIOENGINEERING DEPARTMENT
500 UTA Blvd., Suite 226
Arlington, TX 76010
Phone: 817-272-2249
Email: cbradfield@uta.edu
Web: www.uta.edu/bioengineering

The Bioengineering Department at the University of Texas Arlington offers joint graduate degrees with The University of Texas Southwestern Medical Center at Dallas with many research opportunities in Biomaterials & Tissue Engineering, Bioinstrumentation, Biomechanics, and Medical Imaging. We now also have an Undergraduate Program in Biomedical Engineering. In our exhibit we will have more information about these activities and also information about scholarships and fellowships. Please visit our booth to learn more.

BOOTH # 415
The University of Texas at Austin

DEPARTMENT OF BIOMEDICAL ENGINEERING
107 W. Dean Keeton, C0800
Austin, TX 78712
Phone: 512-475-8623
Email: sbixby@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.

At The University of Texas at Arlington, students — undergraduate and graduate alike — work alongside faculty to solve some of society’s most-pressing biomedical problems.

We are confronting challenges in Biomaterials and Tissue Engineering, Bioinstrumentation, Biomechanics, and Medical Imaging, and our solutions will change the world.

Learn more at uta.edu/bioengineering.
The University of Washington Department of Bioengineering welcomes you to Seattle. Please visit booth 409 or join us on a campus fieldtrip to discover how we are inventing the future of medicine. Our faculty and students are eager to talk to you! 

Valtronic offers full service electronic and mechatronic design, development and manufacturing services for medical devices. With over 30 years experience we have worked on products for the diabetes, cardio, hearing and neurostimulation markets and much more. We offer supply chain management, complete testing, and quality management. We are ISO 13485 certified and FDA registered.
**BOOTH # 214**

**Vanderbilt University**

DEPARTMENT OF BIOMEDICAL ENGINEERING  
5824 Stevenson Center  
Nashville, TN 37235  
Phone: 615-343-1099  
Email: tina.shaw@vanderbilt.edu  
Web: http://engineering.vanderbilt.edu/BiomedicalEngineering.aspx

VU BME bridges Vanderbilt’s engineering, basic science departments, and its renowned medical center; an ideal location for engineering research at the interface of technology and medicine. Research strengths include image-based technologies, nanobiotechnology, biophotonics, modeling, biomaterials, bioregenerative engineering, bioMEMs. VU BME stimulates high impact research and provides unique educational opportunities.

**BOOTHS # 200 / 202 / 204 / 201 / 203 / 205**

**Virginia Tech-Wake Forest University**

SCHOOL OF BIOMEDICAL ENGINEERING & SCIENCE  
VT-WFU SBES:  
317 ICTAS, Stanger Street (MC0298)  
Blacksburg, VA 24061  
Phone: 540-231-8191  
E-mail: pamstiff@vt.edu  
Web: www.sbes.vt.edu

The Virginia Tech – Wake Forest University School for Biomedical Engineering and Sciences offers MS, PhD, MD/PhD, and DVM/PhD degrees. We have 76 biomedical engineering faculty with active research programs in tissue engineering, imaging, biomechanics, medical physics, nano-medicine, & nanobioengineering, neuroengineering, translational oncology, cardiovascular engineering, and other emerging fields.

**BOOTH # 101**

**Washington University in St. Louis**

DEPARTMENT OF BIOMEDICAL ENGINEERING  
One Brookings Drive, Box 1097  
St. Louis, MO 63130  
Phone: 314-935-6164  
Email: bme@seas.wustl.edu  
Web: http://bme.wustl.edu/

In partnership with our world-class medical school, our department emphasizes interdisciplinary, multi-scale training with a medical focus from top-notch faculty. Our main research areas are biomaterials and tissue engineering; cardiovascular engineering; imaging; molecular, cell and systems engineering; and neural engineering. Our department has more than 75,000 sq. ft. of state-of-the-art facilities in Whitaker Hall for Biomedical Engineering and the just completed Brauer Hall. We offer BS, MS, MS/MBA, PhD and MD/PhD degrees.

**BOOTH # 221**

**Wayne State University**

BIOMEDICAL ENGINEERING  
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, MS, PhD and MD/PhD degrees. It is involved in some of the newest ground breaking research in the field. From the use of biomaterials to aid in the regeneration of nerves and the tailoring of these materials to optimize cellular response, to the use of advanced human modeling to study the biomechanics of impact injuries, and the study of sports related injuries and prevention of these injuries, Wayne State will play a major role in the development of new standards to better the quality of human life. Our past research has led to improvement in the standards of the automotive industry, better safer equipment for our soldiers, and a better understanding of injury biomechanics to help prevent and repair damage from these injuries.

**BOOTH # 610**

**Whitaker International Program**

809 United Nations Plaza  
New York, NY 10017  
Phone: 212-984-5442  
Email: saltaf@iie.org  
Web: www.whitaker.org

The Whitaker International Program, founded in 2005 provides funding to emerging U.S.-based leaders in biomedical engineering to conduct a study and/or research project, with the underlying objective of building international bridges. Grant projects – including research, coursework, public policy work – are intended to enhance both the recipient’s career and the BME field. The goal of the Whitaker Program is to assist the development of professional leaders who are not only superb scientists, but who will advance the profession through an international outlook. The Whitaker Program has three sub-programs: Fellows and Scholars Program, Summer Program, and an Undergraduate Program. For more information, including program details, the online application and deadlines, visit: http://www.whitaker.org.
Worcester Polytechnic Institute
100 Institute Road
Worcester, MA 01609
Phone: 508-831-5301
Email: grad@wpi.edu
Web: www.wpi.edu/admissions/graduate

A leader in science, engineering, and business, Worcester Polytechnic Institute anticipated some of the latest trends in higher education by nearly two generations. WPI’s founding principle of balancing theory with practice underlies a project-based, experiential curriculum that prepares students to solve important problems through interdisciplinary study and applied research.

Yale University
Malone Engineering Center
55 Prospect Street
New Haven, CT 06511
Phone: 203-432-4262
Email: tarek.fahmy@yale.edu
Web: www.seas.yale.edu/bme

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.

DISCOVER. INNOVATE. ACHIEVE.

At Worcester Polytechnic Institute, graduate students work in teams with faculty who challenge them to conduct research that matters in the real world. We invite you to discover WPI—a premier university for graduate studies in science, engineering, and business.

Visit WPI’s table at the graduate fair.

grad.wpi.edu/+science
Meeting Location
Washington State Convention Center
800 Convention Place
Seattle, WA 98101-2350
206-694-5000

Sheraton Seattle
1400 Sixth Avenue
Seattle, WA 98101
206-621-9000

Registration
Paid registration is required for admission to all meeting functions including scientific sessions, posters, exhibits, breaks and the BMES BASH at the EMP Museum—Music + Sci Fi + Pop Culture. 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
Wednesday, September 25 11:00am – 7:00pm
Thursday, September 26 7:00am – 6:00pm
Friday, September 27 7:00am – 6:00pm
Saturday, September 28 7:00am – 2:00pm

Exhibits
Exhibit Hall, Washington State Convention Center
Exhibits are located in the Exhibit Hall 4AB in the Washington State Convention Center. Exhibits will be open:

Thursday, September 26
9:30am – 5:00pm
Friday, September 27
9:30am – 5:00pm
Saturday, September 28
9:30am – 1:30pm

Poster Sessions
Exhibit Hall, Washington State Convention Center
Posters are located in the Exhibit Hall 4AB in the Washington State Convention Center. Posters are numbered with a card corresponding to the number assigned in the program. Authors should be present during Poster Sessions as indicated in the Scientific Program.

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

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

Please do not try to connect your own laptop. Please note, it will not be possible to provide special equipment. Any additional equipment will need to be supported by the presenter. Although BMES has paid for WiFi 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 presented Thursday, Friday and Saturday. Posters for both the morning and afternoon sessions will be on display throughout the entire day and should be manned by the author during the time indicated in the Scientific Program, especially during the breaks between platform sessions. All posters will be in the Exhibit Hall 4AB in the Washington State Convention Center. Posters are numbered with a card corresponding to the number assigned in the program.

Speaker Ready Room
Suite A, Suite C (level 6)
In the BMES Speaker Ready Room you will find cables, LCD projector and screen to practice your presentation. Please bring your own laptop.

Wednesday, September 25 11:00am – 5:00pm
Thursday, September 26 7:00am – 5:00pm
Friday, September 27 7:00am – 5:00pm
Saturday, September 28 7:00am – 2:30pm
Program Highlights

Don’t Miss These Events

WEDNESDAY, September 25
Meet the Faculty Candidate Forum

3:30pm - 5:30pm
The “Meet-the-Faculty Candidate” poster session provides a great opportunity for faculty, recruiters, and Department Chairs to speak directly with current graduate students and postdoctoral researchers who are seeking faculty positions.

The BMES 2013 Annual Meeting MEET THE FACULTY CANDIDATE FORUM was only open to those who are actively on the market for the 2013-2014 recruiting cycle. Candidates submitted for consideration in July. The accepted candidates’ CVs can be viewed at www.bmes.org.

Sponsored by

WEDNESDAY, September 25
Welcome Reception

5:30pm - 7:00pm
Washington State Convention Center, Skybridge
Light refreshments will be served. All registrants are invited to attend.

THURSDAY, September 26
BMES State of the Society Address, Town Hall, Fellows Induction & Awards Ceremony

5:45pm – 7:15pm
Washington State Convention Center, Ballroom 6E
Please join us for a dialogue with BMES President Gilda Barabino and other leaders of the Society. The BMES Awards will also be presented. See page 58-59 for the award winners.

Refreshment Breaks

Please note your meeting registration includes morning and afternoon refreshment breaks on Thursday, Friday and Saturday. All refreshment breaks will be in the Exhibit Hall.

Thursday afternoon refreshment break sponsored by

Friday afternoon refreshment break sponsored by

FRIDAY, September 27
BMES Bash at EMP Museum—Music + Sci Fi + Pop Culture

7:00pm - 10:00pm
325 Fifth Avenue N Seattle, WA 98109
Enjoy interesting and unique exhibits along with great food. EMP is a leading-edge, nonprofit museum, dedicated to the ideas and risk-taking that fuel contemporary popular culture. With its roots in rock ‘n’ roll, EMP serves as a gateway museum, reaching multigenerational audiences through their collections, exhibitions, and educational programs, using interactive technologies to engage and empower our visitors. At EMP, artists, audiences and ideas converge, bringing understanding, interpretation, and scholarship to the popular culture of our time. Set amid the backdrop of the Space Needle, and easily accessible from Seattle’s downtown core, the museum’s one-of-a-kind architecture designed by internationally acclaimed architect Frank O. Gehry, EMP is a spectacular venue for this year’s BMES BASH.

Shuttle buses will run continuously from 6:30pm -10:00pm between the Sheraton Seattle and the EMP Museum. Buses will be staged at the Union Street exit of the hotel.
LUNCHEONS

THURSDAY, September 26
Celebration of Minorities in BME Luncheon*
12:00pm - 1:15pm
Washington State Convention Center, Ballroom 6A
*additional registration and $25 ticket required

This is the fourth year of this event 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 on Saturday and the Women in BME Luncheon on Friday.

This year’s lead speaker is Dr. Aida Habtezion, an Assistant Professor of Medicine at Stanford University in the division of Gastroenterology and Hepatology and a faculty member at Stanford Immunology. Born in Eretria, she moved to Canada to obtain her medical degree from McMaster University, completed a gastroenterology fellowship at the University of Toronto, and a postdoctoral research fellowship at Stanford University. Her research is funded by the Robert Wood Johnson Foundation and the National Institutes of Health and involves the study of the inflammatory process and leukocyte recruitment in acute and chronic pancreatitis.

Beyond her incredible research program, Dr. Habtezion brings a message of triumph through ever-changing, unforeseen circumstances and opportunities, while continuing to advance her career in academic medicine and improve the health of underserved populations. Throughout her career, she has made decisions based on family first, core values with which many underrepresented minorities relate and struggle to balance. Please come and hear her message to learn key insights that may help you navigate your own career.

FRIDAY, September 27
Women in BME Luncheon*
12:15pm - 1:15pm
Washington State Convention Center, Ballroom 6A
*additional registration and $25 ticket required

Your Personal Brand: Your Most Powerful Professional Asset
If you don’t know what makes you unique, how will the world know? Learn what a personal brand is and why it matters, the #1 key to building a brand that stands out from every other, and tips and tricks to build your expert status to impact the world. A lively, interactive discussion will be led by Maren Finzer, personal brand strategist and contributor to Personal Branding for Dummies. Combining her contagious enthusiasm and passion for people, Maren helps aspiring professional women coax out their brilliance to build their irresistible personal brands to achieve the happiness and success they imagine. Discover more at www.marenfinzer.com/personal-branding.

Woman in BMES Luncheon Sponsored by

Celebration of Minorities in BME Luncheon Sponsored by

Virginia Tech
Wake Forest University
School of Biomedical Engineering and Sciences
Additional Meetings

Wednesday, September 25

**BME – IDEA Alliance Meeting**  
8:30am – 5:30pm  
Washington State Convention Center, Room 2A2B  
Organizer: Patricia Boynton

**BMES Board of Directors Meeting**  
9:00am – 4:30pm  
Washington State Convention Center, Room 211  
Organizer: Gilda Barabino

**AI&ME Board of Directors Meeting**  
1:00pm – 5:00pm  
Washington State Convention Center, Room 203  
Organizer: Milan Yager

**Annals of Biomedical Engineering - Editorial Board**  
7:00pm - 10:00pm  
Sheraton Seattle, Greenwood Room  
Organizer: Aleta Kalkstein

Thursday, September 26

**BMES National Meetings Committee Meeting**  
8:30am - 10:00am  
Washington State Convention Center, Room 601  
Organizer: Christine Schmidt

**BMES International Affairs Committee Meeting**  
8:00am - 9:00am  
Washington State Convention Center, Room 214  
Organizer: Jennifer Edwards

**Cellular and Molecular Bioengineering - Editorial Board**  
12noon – 1:30pm  
Sheraton Seattle, Greenwood Room  
Organizer: Aleta Kalkstein

**BMES Membership Committee Meeting**  
1:00pm - 2:00pm  
Washington State Convention Center, Room 214  
Organizer: Jennifer Edwards

**AIMBE Council Meeting**  
3:00pm – 4:00pm  
Washington State Convention Center, Room 203  
Organizer: Milan Yager

Friday, September 27

**2014 BMES Annual Meeting Committee Meeting**  
8:30am - 10:00am  
Washington State Convention Center, Room 601  
Organizer: John White

**Cardiovascular Engineering and Technology - Editorial Board**  
12noon - 1:30pm  
Sheraton Seattle, Capital Hill Room  
Organizer: Aleta Kalkstein

**BMES Diversity Committee Meeting**  
3:45pm - 4:45pm  
Washington State Convention Center, Room 214  
Organizer: Michele Surrichio

Saturday, September 28

**BMES Education Committee**  
9:30am – 10:30am  
Washington State Convention Center, Room 601  
Organizer: Michele Surrichio

**BMES Student Affairs Committee Meeting**  
9:30am - 10:30am  
Washington State Convention Center, Room 214  
Organizer: Jennifer Edwards

**BMES Board of Directors Meeting & New Board Orientation**  
12:30pm - 3:00pm  
Washington State Convention Center, Room 211  
Organizer: Gilda Barabino
The career and professional development sessions offer career guidance for job seekers ranging from entry level to experienced professionals. The sessions will highlight both traditional and alternative careers available to BMEs.

**Monday, September 23–Wednesday, September 25**

**Coulter College**
* Hilton Seattle

*By invitation only (pre-registration & pre-qualification required)

BMES partnered with the Wallace H. Coulter Foundation and program instructors John D. DesJardins, Ph.D., from Clemson University Department of Bioengineering and Andrew J. DiMeco, Sr., Ph.D., from UNC/NCSU Joint Department of Biomedical Engineering, to bring Coulter College to the BMES Annual Meeting for a second year. Coulter College is a training program focused on translation of biomedical innovations. Design teams will be guided by faculty and clinical experts through a highly dynamic process designed to help them better understand how innovations can meet clinical needs, while providing tools and approaches used to evolve identified problems into novel solutions. The program is supported through a grant funded by the Wallace H. Coulter Foundation.

**Thursday, September 26**

**An Introduction to BME Career Pathways; Choosing a Career Pathway in BME That’s Right for You**
9:00am – 10:15am
Washington State Convention Center, Room 2AB

At this session you will learn about the main career pathways available to BME professionals: academia, industry and government careers, and why each one may or may not be the right choice for you. This session will allow you to inventory your own values, interests, strengths, and weaknesses so you may select which career pathway you’d like to explore in more detail. Next, attend the three sessions focusing on academic, government, and industry career pathways to continue developing your personal career pathway plan.

**Friday, September 27**

**BME Careers in Industry**
1:30pm – 2:45pm
Washington State Convention Center, Room 2AB

Explore the many and varied career options in industry for BME professionals. You’ll discover the best ways to find jobs in industry, and the recruitment process. You will also hear examples of good and bad resumes to help you create your own winning resume for industry. Finally, this session will offer some valuable tips for making your first year on the job in industry a great one.

**BME Careers in Government**
3:15 – 4:30pm
Washington State Convention Center, Room 2AB

Find out if a career in government is right for you. This session will begin with an overview of a typical career path in government, including the advantages and disadvantages of working for the government. You’ll learn about the different types of federal, state and local government agencies as well as the

**Speed Coaching/One-on-One Career Consulting**

Pre-registration is required for these services.

Meet with career development professionals to address your specific job and career concerns. Meet with career development professionals to address your specific job and career concerns. (Provided complimentary to BMES members). (Provided complimentary to BMES members).

**Thursday, September 26**
1:30pm – 5:30pm

**Friday, September 27**
1:30pm – 5:30pm
Washington State Convention Center, Room 212 & 213
Resume Review and Critique
Have your resume reviewed and critiqued by career professionals and take away writing tips.

Thursday, September 26
1:30pm – 3:30pm & 4:00pm – 6:00pm
Friday, September 27
1:30pm – 2:45pm
Washington State Convention Center, Room 307 & 308

Mock Interview Demonstration
1:45pm – 3:15pm & 4:00pm – 5:30pm
Washington State Convention Center, Room 310
See and hear what happens in a great interview. You’ll discover firsthand what makes a candidate stand out from the crowd and what can instantly sink your chances. You’ll learn how to skillfully respond to tough questions as well as pose questions to impress the recruiter. You’ll not only learn what to do, but most importantly what not to do, to maximize your chances of making an outstanding first impression and getting the job offer.

Career Fair
Friday, September 27
1:00pm – 5:00pm
Washington State Convention Center, South Lobby
Employers and job seekers come together at the Biomedical Engineering Society (BMES) Career Fair. This event is designed to connect organizations looking to hire high-level people with candidates bringing specialized knowledge and innovation to new product and process development, teaching/training, scientific research, critical resource management, and more.

BMES Student Chapter—Outreach and Mentoring Best Practices
9:30am – 10:30am
Washington State Convention Center, Room 2AB
This workshop will feature the BMES Student Chapter at Ohio State University awarded the BMES Outstanding Mentoring Award and the BMES Student Chapter at Stony Brook University awarded the BMES Outstanding Outreach Award. The workshop will provide information on chapter best-practices allowing students to ask questions, exchange ideas and implement goals for the upcoming year.

BMES Student Chapter Outstanding Chapter Best Practices
8:30am – 9:30am
Washington State Convention Center, Room 2AB
This workshop will feature the BMES Student Chapter at the University of California, Davis awarded the BMES Outstanding Student Chapter Award, along with BMES Student Chapter at Johns Hopkins University, awarded the Commendable Achievement Award. The workshop will provide information on chapter best-practices allowing students to ask questions, exchange ideas and implement goals for the upcoming year.

types of jobs for BME’s within these agencies. You will also discover what government recruiters are looking for and how to position yourself to grab their attention. Panelists will describe the often complex ins and outs of the government hiring process, helping you cut through all the red tape. You will also hear examples of good and bad resumes to help you create your winning resume for government.

BME Careers in Academia
5:00pm – 6:15pm
Washington State Convention Center, Room 2AB
Discover the pros and cons of a career in academia. You’ll learn about typical career pathways and job opportunities. You will learn what recruiters are looking for and how you can better position yourself for a faculty position. You’ll explore what you can expect during your first year in academia and what you can do to lay the foundation for a successful career in academia. You will also hear examples of good and bad resumes, to help you create your winning resume for academia.
Alpha Eta Mu Beta (AEMB) Programs

Alpha Eta Mu Beta Annual Convention
Thursday, September 26
4:00pm - 5:00pm
Washington State Convention Center, Room 303
Session Chair: Anthony McGoron, PhD and Dominic 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..

Alpha Eta Mu Beta Reception (Invitation Only)
Thursday, September 26
5:30pm - 7:00pm
The Annual AEMB reception will be held at Daily Grill Restaurant, 629 Pike Street, Seattle, WA 98101
Session Chairs: Rupak Dua, MS, Rafeed Chaudhury, BS, Stephanie Naufel, MS, Rachel Hanks, BS and Dominic E. Nathan, PhD
This session is an 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.

The Importance of Reproducibility in Research Publishing
(Annual Alpha Eta Mu Beta Ethics Session)
Friday, September 27
9:00am - 10:00am
Washington State Convention Center, Room 303
Session Chairs: James B. Bassingthwaighte, PhD and Rupak Dua, MS
Publishing is an important bridge bringing cutting edge research from the lab to the outside world. The ability to fully reproduce research results and implement methods is of the utmost importance. In this talk, we explore the current guidelines in place, the importance of access to experiment data, methods on how to validate and obtain reproducible results, and explore the technology available to facilitate this process in an efficient manner.

Alpha Eta Mu Beta (AEMB), the National Biomedical Engineering Honor Society, is committed to promoting ethics in the field of biomedical engineering. This year, AEMB is honored to host Dr. James B. Bassingthwaighte. Dr. Bassingthwaighte is a Professor of Bioengineering with joint appointments in the departments of Biomathematics and Radiology at the University of Washington. He is an active teacher and internationally known researcher focused on bioengineering and quantitative and integrative approaches to cardiovascular physiology. He received his MD in from the University of Toronto, and completed a residency in Medicine and Cardiology at the Mayo Graduate School of Medicine and Mayo Clinic in Rochester, Minnesota, where he also earned a Ph.D. in Physiology. Dr. Bassingthwaighte is the originator of the Human Physiome Project, a large-scale international program for developing data sharing technologies and biological systems modeling for understanding genomic and pharmacological effects on human physiology. His program is highly collaborative, involving co-investigators at a dozen U.S. universities, several in Europe, and in 14 departments at the University of Washington.
Friday, September 27
2:00pm – 3:00pm
Washington State Convention Center, Room 303

Session Chair: Teresa Murray, PhD
How will sequestration budget cuts impact the biomedical engineering field including your education, jobs in research, and medical discovery? Moreover, how can the simple actions of a single student influence Congress and potentially change the course of history. Hyperbole? Maybe not…. Find the answers at this informative session co-hosted by Alpha Eta Mu Beta (AEMB), the National Biomedical Engineering Honor Society, and the American Institute for Medical and Biological Engineering (AIMBE). Find out first hand from a Washington insider, lobbyist and former Administration official, the details behind how the sausage is really made and how you can influence the outcome of public policy. During this session, you will discover the real impact of sequestration on biomedical engineering and public health. The decisions they are making directly impact your education, job prospects and maybe even your health.

AIMBE represents the top 2% of medical and biological engineers from industry, government, universities and clinical practice. AIMBE is the leading voice for public policy supporting medical and biological engineering innovation to improve public health. AIMBE staff and fellows regularly meet with key administration officials, Congress, and monitor trends in public policy that may impact the field. AEMB members represent the top BME students across the US. Starting in 2006, we have sponsored the Student Ethics Session training future BMEs to evaluate the broader impacts of emerging biomedical innovations. Last year, we initiated the first student public policy session at BMES with our co-sponsor, AIMBE.

The Department of Chemical and Petroleum Engineering at the University of Kansas (KU) is seeking an outstanding candidate with expertise in regenerative medicine and tissue engineering at the Assistant Professor rank, although exceptional candidates at a higher rank will be considered. This faculty position is among those released as part of the School of Engineering Building on Excellence Initiative. Special consideration will be given to applicants committed to excellence who can contribute to the University’s innovative, collaborative, and multidisciplinary initiatives to educate leaders, build healthy communities, and make discoveries that will change the world. See http://www provost.ku.edu/planning/.

The outstanding environment at KU includes two nearby medical centers, two new engineering buildings, the Bioengineering Research Center, and the Institute for Advancing Medical Innovation. The Department of Chemical and Petroleum Engineering has a proud tradition of commitment to both education and research. The department has 19 faculty members, with over 500 undergraduate students and 50 graduate students.

Applications must include a cover letter, CV, and names of at least three references. For additional information and submission of applications, visit http://employment.ku.edu: Select “Search Faculty Jobs” and search with keyword “regenerative”. The position is available beginning August 18, 2014 (January 2014 start date is negotiable). Salary and benefits are competitive and commensurate with qualifications and experience. Questions should be sent to Professor Michael Detamore at detamore@ku.edu. Review of applications will begin on October 18, 2013 and will continue until selections are made. Equal Opportunity Employer M/F/D/V.
Whitaker International Program: Funding Opportunity for Young Biomedical Engineers
Friday, September 27
8:00am - 9:30am
Washington State Convention Center, Room 603
The Whitaker International Program, founded in 2005 provides funding to emerging U.S.-based leaders in biomedical engineering to conduct a study and/or research project, with the underlying objective of building international bridges. Grant projects—including research, coursework, and public policy work—are intended to enhance both the recipient's public career and the BME field. The goal of the Whitaker Program is to assist the development of professional leaders who are not only superb scientists, but who will advance the profession through an international outlook. The Whitaker Program has three sub-programs: Fellows and Scholars Program, Summer Program, and an Undergraduate Program. For more information, including program details, the online application and deadlines, visit: http://www.whitaker.org.

1. Sabeen Altaf (Chair of Session)
   Senior Program Manager, Science and Technology Programs, Institute of International Education

2. Jaclyn Brennan and Elaine Su
   Whitaker International Fellows, 2012-13
   Host Institution: Ecole Polytechnique, France
   Title: The Influence of Hemodynamic Forces and Substrate Selection on Endothelial Cell Migration

3. Ryan Chowdhury
   Whitaker International Fellow, 2012-13
   Host Institution: International Centre for Disease Research, Bangladesh
   Title: Validation of Relatively Inexpensive Portable Microfluidic Technologies Compared to Gold-Standard Techniques for Enumerating CD4+ T-cells and Measuring Viral Load in Bangladeshi HIV Patients

4. G. Ross Malik
   Whitaker International Fellow, 2012-13
   Host Institution: Universidad Carlos III de Madrid, Spain
   Title: Mesenchymal Stem Cells in the Development of an Autologous Engineered Skin

5. Jeffrey Rice
   Whitaker International Scholar, 2009-10
   Host Institution: Ecole Polytechnique Federale de Lausanne (EPFL), Switzerland
   Title: Engineering of Protein Based Bio-matrices for Improved Tissue Repair

6. Holly Weiss
   Whitaker International Fellow, 2010-11
   Host Institution: Katholieke Universiteit Leuven, Belgium
   Title: Developmental Engineering of Tissue Intermediates
STUDENT CHAPTER TABLES

Stop by the Student Chapter Booths inside the Exhibit Hall 4AB to see what’s going on “on campus”!

Boston University
Table 8

Cornell University
Table 12

Johns Hopkins University
Table 2

San Jose State University
Table 7

Stony Brook University
Table 9

University of California, Davis
Table 1

University of Colorado Boulder
Table 4

University of Illinois
Table 11

University of Texas, Austin
Table 6

University of Wisconsin
Table 3

Virginia Commonwealth University
Table 5

Virginia Tech/Wake Forest
Table 10

STUDENT & EARLY CAREER PROGRAMS

University of Washington Campus Tour
Join us for exclusive UW Bioengineering research lab tours at their newest facilities

Transportation Provided
The bus pick up location will be:
WA State Convention Center
One Convention Place
Level 1 South

Thursday, Sept. 26
1:30-3:30 p.m.
Choose from these concurrent tours:
1) UW Campus (Foege BioE Building and MoIES)
2) South Lake Union

Friday, Sept. 27
2:30-4:30 p.m.
Choose from these concurrent tours:
1) UW Campus (Foege BioE Building and MoIES)
2) South Lake Union

About the Facilities
William H. Foege Building: Home to the UW Bioengineering Department and UW Genome Sciences, this 265,000 square-foot facility features a design that encourages collaboration, including coffee lounges and lobbies with whiteboards, and highly advanced lab spaces.

Molecular Engineering & Sciences Institute (MoIES): Opened in fall 2012, the state-of-the-art MoIES building was specially sited to minimize vibration and electromagnetic interference to permit usage of sensitive instrumentation. It features an open layout for shared research space and a dedicated molecular and nanotechnology instrumentation lab.

South Lake Union (SLU): UW Medicine’s biomedical research hub houses more than 600 scientists from across UW disciplines. The four-building lab complex features an eco-friendly, award-winning design and high-end imaging and analysis facilities.

Please note space is limited.

To register or learn more about the labs included on the tours, contact Charles McLien at cwmclien@uw.edu.
Transportation provided
2013 Awards Recipients

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

Robert A. Pritkzer Distinguished Award Lecture  
Ashutosh Chilkoti, PhD  
Duke University

Distinguished Achievement Lecture  
Sue Van  
Wallace H. Coulter Foundation

NIBIB Lecture  
W. Mark Saltzman, PhD  
Yale University

Rita Schaffer Young Investigator Award Lecture  
Susan N. Thomas, PhD  
Georgia Institute of Technology

Diversity Award Lecture  
Cornell University

Distinguished Service Award  
Richard Waugh, PhD  
University of Rochester

Annals of Biomedical Engineering (ABME) Awards

Most Downloaded and Most Cited Article  
June 2012, Volume 40, Issue 6, pp 1339-1355  
Patterning Methods for Polymers in Cell and Tissue Engineering  
Hong Nam Kim¹, Do-Hyun Kang¹, Min Sung Kim¹, Alex Jiao², Deok-Ho Kim² and Kahp-Yang Suh¹  
¹School of Mechanical and Aerospace Engineering, Seoul National University, Seoul, 151-742, Korea ²Department of Bioengineering, University of Washington, Seattle, WA 98195, USA

Editor's Choice Award  
March 2012, Volume 40, Issue 3, pp 750-761  
Mitral Valve Annuloplasty—A Quantitative Clinical and Mechanical Comparison of Different Annuloplasty Devices  
Manuel K. Rausch¹, Wolfgang Bothe¹, John-Peder Escobar Kvitting¹, Julia C. Swanson¹, D. Craig Miller¹ and Ellen Kuhl¹,²,³  
¹Department of Mechanical Engineering, Stanford University, 496 Lomita Mall, Stanford, CA 94305, USA ²Department of Cardiothoracic Surgery, Stanford University, 300 Pasteur Drive, Stanford, CA 94305, USA ³Department of Bioengineering, Stanford University, 496 Lomita Mall, Stanford, CA 94305, USA

Medtronic

Medtronic's Excellence in Modeling Award (MEMA)  
Douglas White  
Georgia Institute of Technology

Medtronic's Excellence in Biomaterials Award (MEBA)  
Jonathan Lam  
University of California, Los Angeles

BMES Extended Abstract: Design and Research Awards:

Graduate Students  
Tom Bongiorno  
Georgia Institute of Technology

Jaideep Dudani  
University of California, Los Angeles

Jinsung Hong  
Georgia Institute of Technology

Gaurav Kaushik  
University of California, San Diego

Michael Michell  
Cornell University

Colin Paul  
Johns Hopkins University

Undergraduate Students  
Jared Barkneck  
Milwaukee School of Engineering

Rebecca Byler  
Georgia Institute of Technology

Zhannetta Gugel  
University of Pittsburgh

Cameron Nemeth  
University of Washington

George Sun  
University of California, Berkeley

Ariel Yang  
State University of New York at Stony Brook
CONGRATULATIONS TO THE
BMES FELLOWS CLASS OF 2013!

ASHUTOSH CHILKOTI, PHD
Duke University

JANE GRANDE-ALLEN, PHD
Rice University

MELISSA KNOTHE TATE, PHD
University of New South Wales, Sydney

SHELLY SAKIYAMA-ELBERT, PHD
Washington University – St. Louis

THOMAS WEBSTER, PHD
Northeastern University

BRUCE WHEELER, PHD
University of Florida

JOYCE WONG, PHD
Boston University

BMES Fellow status is awarded to members who demonstrate exceptional achievements and experience in the field of biomedical engineering, and a consistent record of membership and participation in the Society.
Hosted Receptions

Sheraton Seattle
Thursday, September 26
Individual organizations have set their own times for their private receptions. Please consult your invitation for the specific time. Generally receptions are from 8:00-9:30pm.

Arizona State University
Boren (4th floor)

Cornell University*
Grand Ballroom A (2nd floor)

Georgia Tech University/Emory University*
Grand Ballroom B (2nd floor)

Johns Hopkins University*
Willow A (2nd floor)

Marquette University
Greenwood (3rd floor)

Northeastern University
Ravenna (3rd floor)

Peking University
Kirkland Room (3rd floor)

Rensselaer Polytechnic Institute*
Metropolitan A (3rd floor)

Rice University
Aspen (2nd floor)

University of California Berkeley Bioengineering
Redwood (2nd floor)

University of California, Irvine *
Madrona Room (2nd floor)

University of California Los Angeles*
Ballard (3rd floor)

University of California San Diego
Leschi (3rd floor)

University of Colorado Boulder
University (4th floor)

University of Florida
J. Craydon Pruitt Family Department of Biomedical Engineering
Issaquah (3rd floor)

University of Illinois at Urbana-Champaign
Metropolitan B (3rd Floor)

Peking University
Kirkland (3rd Floor)

University of Pennsylvania
Jefferson (4th Floor)

University of Pittsburgh
Cedar (2nd floor)

University of Rochester*
Columbia (4th floor)

University of Southern California
Juniper (2nd floor)

University of Texas Austin
Willow B (2nd floor)

University of Washington
Citrus Ballroom (35th floor)

Vanderbilt University*
Diamond (1st floor)

Whitaker International Program
Capitol Hill (3rd Floor)

Unless otherwise noted by * these receptions are open to alumni, supporters & friends of the university/organization. Attendees are invited to stop by.
Bioinformatics and Systems Biology  
Orly Alter  
University of Utah

Biomaterials  
Jason Burdick  
University of Pennsylvania  
Helen Lu  
Columbia University

Biomechanics  
Ed Guo  
Columbia University  
Robert Tranquillo  
University of Minnesota

Biomedical Engineering Education  
Angelique Louie  
University of California, Davis  
Conrad Zapanta  
Carnegie Mellon University

Biomedical Imaging and Optics  
Andreas Hielscher  
Columbia University  
Elisa Konofagou  
Columbia University

Cancer Technologies  
Jennifer Cochran  
Stanford University  
Denis Wirtz  
Johns Hopkins University

Cardiovascular Engineering  
Milica Radisic  
University of Toronto  
George Truskey  
Duke University

Cellular and Molecular Bioengineering  
Tejal Desai  
University of California San Francisco  
David Schaffer  
University of California Berkeley

Device Technologies and Biomedical Robotics  
David Kaplan  
Tufts University  
Keefe Manning  
Pennsylvania State University

Drug Delivery  
Guillermo Ameer  
Northwestern University  
Debra Auguste  
City College of New York

Nano to Micro Technologies  
Kevin Healey  
University of California Berkeley  
Luke Lee  
University of California Berkeley

Neural Engineering  
Shelly Sakiyama  
Washington University - St. Louis  
Deborah Leckband  
University of Illinois

New Frontiers and Special Topics  
Ravi Bellamkonda  
Georgia Institute of Technology  
David Putnam  
Cornell University

Respiratory Bioengineering  
Susan Margulies  
University of Pennsylvania  
Dan Weiss  
University of Vermont

Orthopedic and Rehabilitation Engineering  
Clark Hung  
Columbia University  
Johnna Temenoff  
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Michael Smith  
Todd Sulchek  
Wei Tan  
Joe Tien  
Soichiro Yamada  

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Bahman Anvari  
Said Audi  
Chris Bettinger  
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Nenad Bursac  
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Danielle Benoit  
Chris Bettinger  
Rebecca Carrier  
James Cooper  
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Omolola Eniola-Adefeso  
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Qun Wang  
Antonio Webb  
Jian Yang  
Lianfang Zhang  

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Hank Bink  
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Rosalind Most  
Shelly Sakiyama-Elbert  
Sarah Stabenfeldt  
Qi Wang  
Stephanie Willerth  
Justin Williams  

**NEW FRONTIERS AND SPECIAL TOPICS**

Ravi Bellamkonda  
Nassir Mokarram  
David Putnam  
Tarun Saxena  

**ORTHOPEDIC AND REHABILITATION ENGINEERING**

Kyle Allen  
Lawrence Bonassar  
Nadeen Chahine  
David Corr  
Eric Darling  
Michael Detamore  
John Fisher  
Brendan Harley  
Clara Hong  
Kurt Kasper  
John Kisiday  
Spencer Lake  
Robert Mauck  
Steven Nicoll  
Grace O'Connell  
Vassilios Sikavitsas
THURSDAY, September 26, 2013

THURSDAY, September 26
TODAY'S HIGHLIGHTS

PLATFORM SESSIONS Thurs-I 8:00am-9:30am
See pages 66-71, WSCC

EXHIBIT HALL OPEN
WSCC, Exhibit Hall 4AB
9:30am - 5:00pm

POSTER SESSION Thurs A
WSCC, Exhibit Hall 4AB
Poster Viewing with Authors & Refreshment Break
9:30am - 1:00pm

PLENARY SESSION
10:30am - 12noon
WSCC, Ballroom 6E
Robert A. Pritzker Distinguished Lecture
SOLVING DRUG DELIVERY PROBLEMS BY GENETICALLY ENGINEERED POLYPEPTIDES
Ashutosh Chilkoti, PhD

Celebration of Minorities in BME Luncheon
12noon - 1:15pm
Additional ticket purchase required
WSCC, Ballroom 6A

PLATFORM SESSIONS Thurs-2 1:30pm - 3:00pm
See pages 102-108, WSCC

POSTER SESSION Thurs B
WSCC, Exhibit Hall 4AB
1:30pm - 5:00pm
Poster Viewing with Authors & Refreshment Break
3:00pm - 4:00pm

PLATFORM SESSIONS Thurs-3 4:00pm - 5:30pm
See pages 109-114, WSCC

BMES State of the Society, Town Hall & Award Ceremony
WSCC, Ballroom 6E
5:45pm - 7:15pm

Hosted Receptions–Sheraton Seattle
See page 60 for list

Thursday, September 26, 2013
8:00AM – 9:30AM
PLATFORM SESSION – THURS – I

Track: Tissue Engineering
OP - Thurs - 1 – 1 - Room 6B

Bio-Inspired Materials for the Treatment of Arterial Disease

Chairs: Donald Freytes, Keith Gooch

8:00AM
Bio-Inspired Materials for the Treatment of Arterial Disease (Invited)
E. L. CHAIKOF

1Harvard Medical School, Boston, MA

8:30AM
One-Year Follow-up of Host Remodeling of Rapidly Degradable Synthetic Arterial Grafts

1University of Pittsburgh, Pittsburgh, PA; Yale University, New Haven, CT; UPMC, Pittsburgh, PA; 2McGowan Institute for Regenerative Medicine, Pittsburgh, PA

8:45AM
Engineered Heart Tissue Using Polyethylene Glycol Hydrogel
J-L. RUAN, L. TULLOCH, S. BHANDARI, P. D. MARINER, K. S. ANSETH, AND C. E. MURPHY

1University of Washington, Seattle, WA; 2University of Colorado, Boulder, CO

9:00AM
Cell-Derived Protein Delivery: Paracrine Delivery of Molecular Signals in Dual-Cell 3D Protein Gels
J. W. ANDREJECKSI, W. G. CHANG, J. S. POBER, AND W. M. SALTZMAN

1Yale University, New Haven, CT

9:15AM
CXCR4-overexpressing ADSCs Enhanced Angiogenesis and Tissue Salvage in a Murine Model of Hindlimb Ischemia
L. DEVEZA, J. CHOI, J. LEE, N. HUANG, J. COOKE, AND F. YANG

1Stanford University, Stanford, CA

Track: Biomaterials
OP - Thurs - 1 – 2 - Room 6C

Micro and Nanostructured Materials I

Chairs: Gary Bowlin, Helen Lu

8:00AM
Implantable and Degradable Optical and Electronic Medical Devices
D. KAPLAN

1Tufts University, Medford, MA

8:30AM
Bioactive Silicate Nanoplatelets for Osteogenic Differentiation of Human Mesenchymal Stem Cells

1Massachusetts Institute of Technology, Cambridge, MA; 2Harvard University, Cambridge, MA; 3University of Minho, Guimarães, Portugal
8:45AM
Substrate Topography Shapes The Functional Neurons Obtained by
Direct Reprogramming of Fibroblasts
K. KULANGARA1, A. F. ADLER1, H. WANG1, M. CHELLAPAN1, E. HAMMETT1,
R. YASUDA1,2, and K. W. LEONG3
1Duke University, Durham, NC, 2Max Planck Institute Florida, Jupiter, FL

9:00AM
Nanocomposite Gold-Silk Nanofibers
T. COHEN-KARNI1,2, K. JENG1,2, G. REINDORF3, M. MUSTATA4, M. WANUNU1,
R. LANGER1, and D. S. KOHANE1
1MIT, Cambridge, MA, 2Boston Children’s Hospital, Boston, MA, 4Northeastern University, Boston, MA

9:15AM
Direct Laser Writing of Three Dimensional Microscale Features in Silk
Fibroin Hydrogels
M. APPLEGATE1, A. MITROPoulos1, B. MARELLI1, and F. OMIENETTO1
1Tufts University, Medford, MA

Track: Biomaterials
OP - Thurs - 1 – 3 - Room 606
Biomaterials for Immunoengineering I

Chairs: Chris Jewell, Ben Keselowsky

8:00AM
Biomaterial-Based Immunoengineering (Invited)
J. BABENSEE1
1Georgia Institute of Technology, Atlanta, GA

8:30AM
Gene-Releasing Scaffolds for Immunomodulation
R. M. GOWER1, S. M. AZARIN1, C. F. RICCI1, X. ZHANG1, and L. D. SHEA1
1Northwestern University, Chicago, IL

8:45AM
Amphiphile-Based Programming of Immunity by Molecular
Self-Delivering Vaccines
H. LIU1 and D. IRVINE1,2
1MIT, Cambridge, MA, 2Howard Hughes Medical Institute, Chevy Chase, MD

9:00AM
Particulate Delivery of Small-Molecule Immunomodulators
to Enhance a Liposomal HIV Epitope Vaccine
M. HANSON1, W. ABRAHAM1, and D. J. IRVINE1,2
1Massachusetts Institute of Technology, Cambridge, MA, 2Howard Hughes Medical Institute, Chevy Chase, MD

9:15AM
A Microparticle-Based Vaccine for Prevention of Type 1 Diabetes
J. S. LEWIS1, M. CARSTENS1, N. DOLGOVA1, C-Q. XIA1, M. CLARE-SALZER1,
and B. KESELOVSKY1
1University of Florida, Gainesville, FL

8:15AM
Quantifying Structural and Functional Changes in Cardiac Cells
in an In Vitro Model of Diabetic Cardiomyopathy
J. MICHAELSON1 and H. HUANG1
1Columbia University, New York, NY

8:30AM
In Vitro Estimation of Compressive Damage Threshold of Muscle Cells
for Deep Tissue Injuries
Y. YAO1, S. WONG1, L. BIAN1, and A. MA1
1The Chinese University of Hong Kong, Hong Kong, China, People’s Republic of

8:45AM
Shaping the Vertebrate Eye: Mechanics of Optic Cup Formation
A. OLEJEAN1, D. C. BEEBE1, and L. A. TABER1
1Washington University in St. Louis, St Louis, MO, 2Washington University School of Medicine, St. Louis, MO

9:00AM
AKAPs Mediate Sickle Cell Disease Erythrocyte Adhesion via BCAM/Lu
J. L. MACIASZEK1, B. ANDERAMARI1, and G. LYKOTRAFITS1
1University of Connecticut, Storrs, CT, 2University of Connecticut Health Center, Farmington, CT

9:15AM
Effect of Pseudopodial Extensions on Neutrophil Hydrodynamics
and Adhesion Binding
A. ROCHELEAU1, W. WANG1, and M. KING1
1Cornell University, Ithaca, NY

Track: Biomechanics
OP - Thurs - 1 – 5 - Room 608
Orthopaedic and Dental Biomechanics I

Chairs: Ed Guo, David Kohn

8:00AM
Theoretical and Computational Modeling of Tissue Growth Mechanics
with Applications to Quantitative Cartilage Tissue Engineering
(Invited)
G. ATESHIAN1
1Columbia University, New York, NY

8:30AM
Investigation of Trachea Cartilage Viscoelasticity
S. BIECHEL1, B. KORINS1, J. LUSK1, and S. WILLIAMS1
1Base Corporation, Eden Prairie, MN

8:45AM
A Magnesium-Based Ring for Repair of an Injured Anterior Cruciate
Ligament – In Vitro Cyclic Testing
H. EASON1, K. FARRARO1, N. SASAKI1, and S. WOO1
1University of Pittsburgh, Pittsburgh, PA

9:00AM
Glenoid Loading and Stability of the Inlay versus Onlay Shoulder
Implant Systems
B. T. PRZESTRELSKI1, N. NJINIMBAS1, R. HAWKINS1, G. COLBATH1, J. GAGLIANO1, and
J. DELJARDINS1
1Clemson University, Clemson, SC, 2Steadman Hawkins Clinic of the Carolinas, Greenville, SC

9:15AM
Effect of Intramembranous Mineralization on the Mechanical Behavior
of Bone
J. SAMUEL1, C. SHOME1, and X. WANG1
1University of Texas at San Antonio, San Antonio, TX
Track: Cancer Technologies

OP - Thurs - 1 – 6 - Room 609

Bioengineering of Cancer I

Chairs: Jennifer Cochran, Matthew Lazzara

8:00AM

AXL Overexpression as a Mechanism for Resistance Against ErbB-Targeted Therapeutics in Triple Negative Breast Cancer (Invited)
D. A. LAUPPENBURGER1
1Massachusetts Institute of Technology, Cambridge, MA

8:30AM

Imbalanced Oncogenic Signaling Initiated by Structurally Distinct Mutants of EGFR in Lung and Brain Cancers
M. J. LAZZARA1, C. FURCHT1, J. BUONATO1, and A. WALSH1
1University of Pennsylvania, Philadelphia, PA

8:45AM

Genetic Pathway Analysis for Mechanisms-induced Colon Cancer Metastasis
X. TANG1, T. KUHLENSCHMIDT1, Q. LI1, H. CHEN1, M. KUHLENSCHMIDT1, and T. SAI1
1University of Illinois at Urbana-Champaign, Urbana, IL

9:00AM

Interstitial Fluid Flow Stimulates Invasion of both ErbB2-overexpressing Breast Cancer Cells and Acini
A. M. TCHAFA1, M. J. REGINATO1, and A. C. SHIEH1
1Drexel University, Philadelphia, PA, 2Drexel University College of Medicine, Philadelphia, PA

9:15AM

Loss of Lamin B2 Expression Enhances 3D Migration in HT180 Fibrosarcoma
U. S. JONNALAGADDA1, C. M. DENHIS1, M. KRAUSE1, K. WOLF1, and J. LAMMERDING2
1Cornell University, Ithaca, NY, 2Radboud University Nijmegen Medical Center, Nijmegen, Netherlands

Track: Cardiovascular Engineering

OP - Thurs - 1 – 7 - Room 612

Cardiac Electrophysiology and Mechanics

Chairs: Nenad Bursac, Naomi Chesler

8:00AM

Engineered Somatic Cells for Enhancement and Studies of Cardiac Electrophysiology (Invited)
N. BURSAC1
1Duke University, Durham, NC

8:15AM

Elucidating the Mechanical Role of the Intercalated Disc in Age-Associated Heart Failure
G. KAUSHIK1, A. SESSIONS1, A. SPENLEHAUER2, M. NISHIMURA1, K. OCCI2, R. BODMER1, A. CAMMARATO1, and A. J. ENGLER1
1University of California, San Diego, La Jolla, CA, 2Imperial College London, London, United Kingdom, 3Sanford-Burnham Medical Research Institute, La Jolla, CA, 4Johns Hopkins University, Baltimore, MD

8:30AM

Right Ventricular Adaptation to Pulmonary Hypertension in a Rat Model
M. R. MILL1, D. VALDEZ-JASSIDO1, M. A. SIMON1, H. C. CHAMPION2, and M. S. SACKS1
1University of Texas, Austin, TX, 2University of Pittsburgh, Pittsburgh, PA

9:00AM

Can the Single-Beat Method be Used to Assess Right Ventricular Contractility in Different Species?
A. BELLOFIORE1, F. OMO1, D. SCHREIER1, T. A. HACKER1, G. SONI1, M. L. BATES1, H. B. KELLIHAN1, D. W. CONSIDN1, C. J. FRANCOIS1, and N. C. CHESLER1
1University of Wisconsin-Madison, Madison, WI

9:00AM

Optimizing Ultrasound Properties for Ultrasound Current Source Density Imaging of the Heart
Q. LI1, Y. QIN1, P. INGRAM1, and R. WITTE1
1University of Arizona, Tucson, AZ

9:15AM

Identifying Dynamic Entrapment in a High-Dimensional Complex Nonlinear System via Coarse-Grain Graph Reduction: Implications for Cardiac Arrhythmia
O. R. BATES1, J. H. BATES1, B. SUKI2, and P. S. SPECTOR3
1Boston University, Boston, MA, 2University of Vermont, Burlington, VT

Track: Cellular and Molecular Bioengineering

OP - Thurs - 1 – 8 - Room 604

Mechanotransduction I

Chairs: Sanjay Kumar, Cynthia Reinhart-King

8:00AM

OVERVIEW TALK - Cellular and Molecular Bioengineering
D. SCHAEFFER1, T. DESA1
1University of California, Berkeley, CA, 2University of California, San Francisco, CA

8:15AM

Cytoskeletal Connectivity to the Nucleus Regulates MSC Nuclear Strain Transfer and Mechanotransduction
T. P. DRISCOLL1, S. HE1, Z. E. SHURDIN1, and R. L. MAUCK1
1University of Pennsylvania, Philadelphia, PA

8:30AM

Getting the (Mechanical) Message Across Cell-Cell Junctions
D. LECKBAND1, I. MUHAMED1, A. BARRY1, J. WU1, H. TABOLI1, C. GOTTARDI2, J. DEROO1, and N. WANG1
1University of Illinois, Urbana, IL, 2Northwestern University College of Medicine, Chicago, IL, 3HUBRECHT INSTITUTE, Utrecht, Netherlands

8:45AM

Glycocalyx Core Protein-Dependent Endothelial Mechanotransduction
E. E. EBONG1, D. C. SPRAY1, and J. M. TARBEIL1
1Albert Einstein College of Medicine, New York, NY, 2City College of New York, New York, NY

9:00AM

Vasculogenesis Dynamics and Integrity are Altered in Response to 3D Matrix Stiffening
B. N. MASON1, J. HUYNH1, L. J. BONASSARI1, and C. A. REINHART-KING1
1Cornell University, Ithaca, NY

9:15AM

Migration-Dependent Regulation of Cellular Mechanical Output Through a FAK- and Phosphopaxillin-Dependent Mechanism
S. CHANG1, A. RAPE1, W-H. GUO1, and Y-L. WANG1
1Carnegie Mellon University, Pittsburgh, PA
Track: Cellular and Molecular Bioengineering
OP - Thurs - 1 – 9 - Room 611

Cell Motility I

Chairs: Manu Platt, Ankur Singh

8:00AM
Role of Ion Channels and Aquaporins in Cell Migration in Confined Microenvironments
K. M. STROKA1, H. JIANG1, S. X. SUN1, and K. KONSTANTOPoulos1
1Johns Hopkins University, Baltimore, MD

8:15AM
3D Matrix Microstructure Directs Cell Migration and MT1-MMP Utility via Protrusion Dynamics
S. I. FRALEY1, P. H. WU1, L. HE1, Y. FENG1, G. LONGMORE1, and D. WIRZ1
1The Johns Hopkins School of Medicine, Baltimore, MD; 2The Johns Hopkins University, Baltimore, MD; 3Washington University School of Medicine, St. Louis, MO

8:30AM
T Cells Sense Biophysical Cues Using Lamellipodia and Filopodia to Optimize Intraluminal Path Finding
K. SONG1 and J. DOH1
1POSTECH, Pohang, Korea, Republic of

8:45AM
Fibronectin on PDMS Elicits a Well-Spread Morphology in Migrating hNeutrophils via α2 Integrin
S. J. HENRY1, J. C. CROCKER1, and D. A. HAMMER1
1University of Pennsylvania, Philadelphia, PA

9:00AM
The Critical Role of EB1 and Dynein in Three-Dimensional Cell Migration
A. GIRI1,2, H. JAYATILAKA1, N. TRENTON1, and D. WIRZ1,2
1Chemical and Biomolecular Engineering, Johns Hopkins University, Baltimore, MD; 2Johns Hopkins Engineering in Oncology Center, Johns Hopkins University, Baltimore, MD

9:15AM
Characterization and Modeling Cancer Cell Motility in 2D and 3D
P-H. WU1, A. GIRI1, G. LANG1, and D. WIRZ1
1Johns Hopkins University, Baltimore, MD; 2The George Washington University, Washington, DC

Track: Device Technologies and Biomedical Robotics
OP - Thurs - 1 – 10 - Room 602

Biosensors I

Chairs: Alexander Revzin, John Framptona

8:00AM
Enrichment and Detection of Blood Biomarkers with Microdevices (Invited)
S. ZHENG1
1Pennsylvania State University, University Park, PA

8:30AM
Electroporation-Delivered Protein Biosensors for Study of Molecular Activity
C. SUN1, Y. WANG1, Y. WANG1, and C. LU1
1Virginia Tech, Blacksburg, VA; 2University of California, San Diego, La Jolla, CA

8:45AM
Optical-microfluidic Platform for Real-time Monitoring of Live Cell Secretory Activities Using Fano Resonance in Gold Nanorods
S-H. WU1, K-L. LEE1, A. CHIOU1, P-K. WEN1, and X. CHENG1
1Institute of Biophotonics, National Yang-Ming University, Taipei, Taiwan; 2Research Center for Applied Sciences, Academia Sinica, Taipei, Taiwan; 3Biotechnology Program, Lehigh University, Bethlehem, PA

9:00AM
Implantable Optical Continuous Lactate Sensor in Cyanide Poisoning Model
J. WEIDING1 and E. BOYVINIC2
1University of California Irvine, Irvine, CA; 2University of California Irvine, Irvine, CA

9:15AM
A Low-Power CMOS pH Monitoring System
R. CHOEKJ1, S. VADIVAJI1, A. LEGASSEY1, P. PANADAIMITRAKOPOULOS1, and F. JAIN1
1Biorasis, Inc., Storrs, CT; 2The University of Connecticut, Storrs, CT; 3University of Connecticut, Storrs, CT

Track: Bioinformatics, Computational and Systems Biology
OP - Thurs - 1 – 11 - Room 615

Genomics, Transcriptomics and Proteomics I

Chairs: Olver Afset, Phil Green, Matteo Pellegrini

8:00AM
Discovery of Mechanisms and Prognosis of Cancers from Matrix and Genomics, Transcriptomics and Proteomics I

8:30AM
How Much of the Human Genome is Functional? (Invited)
P. GREEN1
1University of Washington, Seattle, WA

9:00AM
Transgenerational Inheritance of DNA Methylation (Invited)
M. PELLEGRINI1
1University of California, Los Angeles, CA

Track: Orthopaedic and Rehabilitation Engineering
OP - Thurs - 1 – 12 - Room 616

Animal Models in Musculoskeletal Diseases

Chairs: Kyle Allen, Catherine Ku0

8:00AM
Structure-Property Relationships of Tendon During Embryonic Development (Invited)
C. K. KU01
1Tufts University, Medford, MA; 2Tufts University School of Medicine, Boston, MA

8:30AM
The Skeleton As A Complex System: Emergent Bone Loss Signatures Following Neuromuscular Injury In Zebrafish
P. HUBER1, B. J. AUSK1, E. M. GARDINER1, S. D. BAIN1, S. SRINIVASAN1, T. S. GROSS1, and R. Y. KWON1
1University of Washington, Seattle, WA
Intra-Articular Nerve Growth Factor is Both Necessary and Sufficient for the Development of Joint Pain and Contributes to Central Sensitization

J. Kras1 and B. A. Winkelstein1
1University of Pennsylvania, Philadelphia, PA

8:45 AM

Tracks: Biomedical Imaging and Optics

OP - Thurs - 1 – 13 - Room 618

Fluorescence Imaging

Chairs: Yu Chen

8:00 AM

Angled Fluorescence Laminar Optical Tomography for Imaging of Engineered Bone Constructs

C-W. Chen1, B-N. Nguyen1, J. P. Fisher1, and Y. Chen1
1University of Maryland, College Park, MD

8:15 AM

Optimization of Time Gate Selection for Bi-exponential Fluorescence Lifetime Imaging

T. Dmeer1, N. Sinsubphon1, L. Zhao1, X. Intes1, and J. Seibel1
1Rensselaer Polytechnic Institute, Troy, NY

8:30 AM

Concurrent Wide-field Multi-Color Fluorescence Imaging Using a Scanning Fiber Endoscope

C. Yang1, Y. Hou1, L. Y. Nelson1, and E. J. Seibel1
1University of Washington, Seattle, WA

8:45 AM

Detecting Metabolic Changes Associated with Oncoprotein Expression Using Endogenous Fluorescence

J. Yulas1, K. P. Quinn1, A. Varone1, M. E. McLaughlin-Drubin2, G. V. Srihara1, K. Lee1, K. Munger1, and I. Georgakoudi1
1Tufts University, Medford, MA; 2Harvard Medical School, Boston, MA

9:00 AM

A Compact Live Cell Imaging System with a Silo-Filter Fluorescence Image Sensor

S. Lee1, X. Ou1, J. E. Lee1, and C. Yang1
1California Institute of Technology, Pasadena, CA; 2Korea Research Institute of Standards and Science, Daejeon, Korea, Republic of

9:15 AM

Synthesis and Characterization of Photoswitchable Fluorophores for Super Resolution Microscopy

A. M. Bittel1, A. Nickerson1, L-J. Lin1, X. Nan1, and S. L. Gibbs1
1Oregon Health and Science University, Portland, OR

Track: Drug Delivery

OP - Thurs - 1 – 15 - Room 620

Novel Materials and Self Assembly

Chairs: Guillermo Amer, Rebecca Carrier

8:00 AM

Nanonest: A New Platform for Nano to Micro-scale Delivery of Therapeutics (Invited)

J. Yang1, G. Ame1, and R. Van Lith1
1Northwestern University, Evanston, IL

8:30 AM

Depots of Glucagon-Like Peptide-1 Fused to a Thermosensitive Polypeptide Can Be Stabilized By Lowering the Transition Temperature

K. Luginbuhl1, X. Li1, and A. Chilkoti1
1Duke University, Durham, NC

8:45 AM

Enhanced Delivery of Chemotherapeutics Using Targeted Block Copolymer Vesicles

K. M. Mayle1, U-J. Choe1, A. R. Rodriguez1, B. S. Lee1, A. T. Yip1, T. J. Dening1, and D. T. Kame1
1University of California, Los Angeles, Los Angeles, CA

9:00 AM

Coacervate-based Co-delivery of VEGF and HGF Displays Synergistic Angiogenic Effects

H. Avada1, N. Johnson1, and Y. Wang1
1University of Pittsburgh, Pittsburgh, PA; 2McGowan Institute for Regenerative Medicine, Pittsburgh, PA
9:15AM  Inhibition of Pathogenic Angiogenesis Using a Hyaluronic Acid Based Multivalent VEGF Antagonist
E. Alito1, A. Jha1, J. Santiago1, W. Jackson1, D. Schaffer1, and K. Healy1
1University of California Berkeley, Berkeley, CA

Track: Neural Engineering
OP - Thurs - 1 – 16 - Room 613
Engineering the Neural Environment

Chairs: Sarah Stabenfeldt, Deanna M Thompson

8:00AM  Development of a Combinatorial, Biomaterial-Mediated Gene Therapy for Spinal Cord Regeneration
S. K. Seidlits1, D. Marigli1, R. Boehler1, A. Thomas1, A. Goodman1, T. He1, T. Kukushkina2, H. Tunstra2, B. Cunnings2, A. Anderson2, and L. Shea1
1Northwestern University, Evanston, IL; 2University of California Irvine, Irvine, CA

8:15AM  Conductive Single Walled Carbon Nanotube-Composite Hydrogels For Neural Engineering Applications
A. Koppes1, K. Keating1, A. McGreggor1, R. Koppes1, C. McKay1, J. ZuideMa1, C. River1, R. Gilbert1, and D. Thompson1
1Rensselaer Polytechnic Institute, Troy, NY

8:30AM  A Tube-formed in vitro Blood-Brain-Barrier Model in Planar Microfluidics
H. Cho1, J. Seo1, K. Wong1, K. Bong1, K. Ara1, E. H. Lo1, and D. IRima1
1Harvard Medical University/MGH, Charlestown, MA

8:45AM  SDF-1-ECM Crosstalk and its Effect on Neural Stem Cell Fate
C. P. Addington1, C. Paulen1, M. Caplan1, and S. Stabenfeldt1
1Arizona State University, Tempe, AZ

9:00AM  Generation of Enriched Human Neural Cells in 3D Fibrous Microenvironments By Direct Conversion of Pluripotent Stem Cells
A. L. Carlso1, N. K. Bennett1, J. C. Moore1, R. P. Hart1, and P. V. Moghe1
1Rutgers, The State University of New Jersey, Piscataway, NJ

9:15AM  Molecular Mediators of Neurodegeneration at the Cortical-Tissue Device Interface
M. Rakhum1, S. Sunil3, D. Hageman1, W. Tomaszewski1, and J. Capadona1
1Case Western Reserve University, Cleveland, OH

Track: Biomedical Engineering Education
OP - Thurs - 1 – 18 - Room 603
New Approaches to BME Education

Chairs: Angelique Louie, Conrad Zapanta

8:00AM  1st International Biomedical Engineering – Innovation, Design & Entrepreneurship Alliance Workshop
J. H. Linehan2, M. Bruzz2, J. B. Pietzch2, and P. G. Yock2
1Northwestern University, Evanston, IL; 2Stanford University, Palo Alto, CA

8:15AM  A Unique Dual Major Approach for Undergraduate Biomedical Engineering Education at Carnegie Mellon University
T. M. Przybycien1, R. D. Tilson1, Y-L. Wang1, and C. M. Zapanta1
1Carnegie Mellon University, Pittsburgh, PA

8:30AM  Biodesign for First-Year Students
P. Ciag1 and C. K. Drummond2
1Case Western Reserve Engineering, Cleveland, OH; 2Case Western Reserve University, Cleveland, OH

8:45AM  Achievement Motivation Differences Between Bioengineering and Mechanical Engineering Students
A. N. Kin1 and L. C. Benson1
1Clemson University, Clemson, SC

9:00AM  The T-Shaped Biomedical Engineer: Connecting the TOP to the STEM
J. Tranquillo1
1Bucknell University, Lewisburg, PA
Thursday, September 26, 2013

9:30AM – 1:00PM
POSTER SESSION – THURS – A

Track: Biomaterials

Biomaterial Scaffolds

P – Th - A - 1
Macroporous Acroporous Cell-Laden Hydrogels Fabricated with Photocrosslinked Alginates for Tissue Engineering
O. JON, P. N. DANI, and E. ALSBERG
1Case Western Reserve University, Cleveland, OH

P – Th - A - 2
A 3D Alginic Scaffold to Promote Early Osteogenic Differentiation of Mouse Mesenchymal Stem Cells
B. H. MCGRAVE2 and J. NAKAtOMI3
1Clemson University, Clemson, SC

P – Th - A - 3
The Manipulation of Hydrogel Lumen Architecture for Potential Biomedical Applications
R. C. THOMAS4, P. CHUNG3, and C. E. SCHMIDT2
1University of Texas at Austin, Austin, TX, 2University of Florida, Gainesville, FL

P – Th - A - 4
Scaffold stiffening and Vascular Stability
K. L. CHAN1, A. H. KHANHELI1, R. L. THOMPSON1, K. H. WONG1, J. G. TRUSLOW1, B. J. COISMAN4, and J. YEN1
1Boston University, Boston, MA

Collagen-Matrigel Scaffolds for Enhanced Pancreatic Differentiation from Human Embryonic Stem Cells
W. WANG1, S. JIN1, and K. YE1
1University of Arkansas, Fayetteville, AR

P – Th - A - 6
A Novel Scaffold for Vascular Tissue Engineering
K. J. MCHUGH1, S. L. TAO2,3, and M. SAINT-GENEIZ2
1Boston University, Boston, MA, 2Scheepers Eye Research Institute, Boston, MA, 3Charles Stark Draper Laboratory, Inc., Cambridge, MA, 4Current Affiliation: CooperVision, Inc., Pleasanton, CA, 5Harvard Medical School, Boston, MA

P – Th - A - 7
Porous Poly(lacto-glycolic acid) Microspheres For In Vitro Drug Screening and Tissue Engineering Applications
J. U. MEIJDIN1,2, A. E. KURIAKOSE3,2, V. SUNDARESAN1,2, and K. T. NGUYEN4,2
1University of Texas at Arlington, Arlington, TX, 2UT Southwestern Medical Center, Dallas, TX

P – Th - A - 8
Optimization of 2D Biological Scaffolds for Investigations on Ultrasound Mediated Drug Delivery
A. ALEID1, A. ALASSAF1, O. C. WILSON, JR1, P. MEHL1, and V. FRENKEL1
1Catholic University of America, Washington, DC

P – Th - A - 9
Response of Chitosan/PCL Nanofibers with Airway Epithelial Cells
N. BHATTARAI1, C. MAHONEY1, K. XU1, and J. WATERMAN1
1North Carolina A&T State University, Greensboro, NC

P – Th - A - 10
Cellular Response of Chitosan Based Scaffolds with Mesangial Cells
S. JONES1, M. MCCULLUGH1, E. ONDER1, and N. BHATTARAI1
1North Carolina A&T State University, Greensboro, NC

P – Th - A - 11
Dendritic Cells Response to Biomaterial Porous Scaffold
R. CHEN1 and J. D. BRYERS1
1University of Washington, Seattle, WA

P – Th - A - 12
Electrospinning Extracellular Matrix Proteins
L. W. PLACE1, V. LESZCZAK1, K. SMITH1, N. S. FRANZ1, B. ATKINSON2, K. C. POPAT1, and M. J. KIPPER1
1Colorado State University, Fort Collins, CO, 2AlloSource, Centennial, CO

P – Th - A - 13
Novel Decellularized Cartilage Nanocomposite Hydrogel for Injectable Tissue Engineering Scaffolds
E. BECK1 and M. DETAMORE1
1University of Kansas, Lawrence, KS

P – Th - A - 14
An In Vitro Model for High-throughput Screening of Antifungals Against Invasive Candida albicans Biofilms
A. SPINNASAN1, C. M. GUPTA1, M. AGRAWAL1, J. L. LOPEZ-ROBOT1, and A. K. RAMASUBRAMANIAN1
1The University of Texas at San Antonio, San Antonio, TX

P – Th - A - 15
Inkjet Bioprinting of Solid Peroxide for Oxygen Releasing Scaffolds Construction
D. REYNA1, J. RODRIGUEZ-DEVORA1, and T. BOLAND1
1University of Texas at El Paso, El Paso, TX

P – Th - A - 16
Insertion of PLA Film on Scaffold HA/TCP: In Vitro Test
L. R. RODRIGUEZ1,2, C. A. ZAVAGLIA1,2, and C. B. LOMBELLO1
1UFABC, Santo André, Brazil, 2INCT-BIOFABRIS, Campinas, Brazil, 3FEM-UNICAMP, Campinas, Brazil

P – Th - A - 17
Biofabrication of 3D Collagen Scaffold Mimicking the In Vivo Tissue Architecture
V. RODRIGUEZ-RIVERA1, R. GOODWIN2, J. W. WEIDNER2, and M. J. YOST3
1University of South Carolina, Columbia, SC, 2University of South Carolina-School of Medicine, Columbia, SC, 3Medical University of South Carolina, Charleston, SC

P – Th - A - 18
An In Vitro and In Vivo Study of AuNP-Collagen Scaffolds
S. GRANT1, J. ZHU1, R. RONE1, L. JIMENEZ1, and D. GRANT1
1University of Missouri, Columbia, MO

P – Th - A - 19
Poly(lactic acid) Microbubbles as Stable Porogens for Tissue Engineered Scaffolds
P. A. MOUNTFORD1, S. R. SIRIS1, I. M. BAUS1, E. J. KINZIE1, S. A. ETEZAZIAN1, E. G. LIMA1, C. T. HUNI1, and M. A. BOREN1
1University of Colorado Boulder, Boulder, CO, 2Columbia University, New York, NY

P – Th - A - 20
Three Dimensional Hyaluronic Acid and Gelatin Hydrogels as an In Vitro Platform for Long-Term Monitoring of Glioblastoma Invasion
J. M. HEFFERNAN1, D. J. OVERSTREET1, B. L. VERNON1, and R. W. SIRIANI1
1Barrow Neurological Institute, Phoenix, AZ, 2Arizona State University, Tempe, AZ

P – Th - A - 21
Evaluating 3D Porous Geopolymers As Cancellous Bone Filling Biomaterials
P. M. MEHL1, W. GONG1, and I. L. PEGG2
1Catholic University of America, Washington, DC

P = Poster Session
OP = Oral Presentation
P – Th - A - 22
Nanopatterning Wrinkles into Biodegradable Materials for Aligning Heart Cells
S. VANI1, W. TURNER2, and K. MCCLOSKEY1
1School of Natural Sciences, University of California, Merced, Merced, CA
2School of Engineering, University of California, Merced, Merced, CA

P – Th - A - 23
CANCELLED BY AUTHOR

P – Th - A - 24
Tubular Esophageal Tissue Construct Bioengineered from Isolated Esophageal Smooth Muscle Cells
E. ZAKHEM1,2, and K. N. BITARI1,2
1Virginia Tech-Wake Forest School of Biomedical Engineering and Sciences, Winston Salem, NC
2Wake Forest Institute for Regenerative Medicine, Winston Salem, NC

P – Th - A - 25
Correlation Between Ultrasound Attenuation and Structural Properties of Porous Scaffolds Depends on the Porosity Level
L. LIN1, L. WU2, and Y.X. QIN3
1Stony Brook University, Stony Brook, NY

P – Th - A - 26
Scaffold Permeability Estimated Using Average Pore Characteristics is Useful in Pressure Drop Predictions
J. T. PODICHERTY1, A. KHALF1, and S. V. MADHALLY1
1Oklahoma State University, Stillwater, OK

P – Th - A - 27
Aligned Polymer Nanofibers Modified with Extracellular Matrix Protein Binding Domains Enhance Motor Neuron Growth
J. E. GOODMAN1,2, Y. I. NAIM2,3, E. W. FRANZ1,5, M. K. LEACH1,5, A. RASTOGI1,2, S. J. TUCK1,5, S. FERRIS1,2, and J. M. COREY1,2
1Geriatrics Research, Education, and Clinical Center, Veterans Affairs, Ann Arbor, MI
2Department of Neurology, Ann Arbor, MI
3Department of Biomedical Engineering, Ann Arbor, MI

P – Th - A - 28
Development of a Novel Device for the Perfusion Driven Decellularization of Skeletal Muscle
B. KASUKONIS1 and J. WOLCHOK1
1University of Arkansas, Fayetteville, AR

P – Th - A - 29
Shear-Induced Prevention of Shunt Occlusion in a 3D Astrocyte Culture Model
C. HARRIS1, K. PEARSON1, W. SHAIN2,3, K. TREVET1, S. BROD1,4, T. CLEMENT1, B. LUTZ2,3, and J. RELETHFORD1
1Seattle Children’s Research Institute, Seattle, WA
2University of Washington, Seattle, WA
3Seattle Children’s Hospital, Seattle, WA
4Aqueduct Neurosciences, Seattle, WA

P – Th - A - 30
Development and Implementation of Artificial Ovary Using Multi-arm Poly-(ethylene glycol) Hydrogels
J. KIM1 and A. SHIKANOV1
1University of Michigan, Ann Arbor, MI

Track: Biomaterials

Micro and Nano Structured Materials

P – Th - A - 31
Regenerative Integration of Percutaneous Devices Using Macrophase Modulating Elastomers
P. PHOLIAB3, P. CAMPBELL1, and C. J. BETTINGER1
1Carnegie Mellon University, Pittsburgh, PA

P – Th - A - 32
Multiscale Composite Alginate Hydrogels: A Platform Technology for Multifunctional Injectable Biomaterials
J. R. ROBERTS1, D. RITTER1, and M. MCMANUS1
1Texas A&M University, College Station, TX

P – Th - A - 33
Endothelial Signaling on Micro- & Nano-Patterned Titanium
P. VANDRANG1, K. KOZAKA1, S. GOTT1, M. P. RAU1, and V. G. RODGERS1
1University of California Riverside, Riverside, CA

P – Th - A - 34
Molecular Level Control of Microengineered Matrices for Studying and Directing Cell Fate
K. A. KILIAN1
1University of Illinois at Urbana-Champaign, Urbana, IL

P – Th - A - 35
Cytocompatibility of Three-Dimensional Macroporous Multiwalled Carbon Nanotube Scaffolds
G. LALWANI1, Y. TALUKDAR1, and B. SITHARAMAN1
1Stony Brook University, Stony Brook, NY

P – Th - A - 36
In Vitro Cytotoxicity of Molybdenum Disulfide Nanoplatelets or Tungsten Disulfide Nanotubes
J. T. RASHKOV1, Y. TALUKDAR1, G. LALWANI1, and B. SITHARAMAN1
1Stony Brook University, Stony Brook, NY

P – Th - A - 37
In situ Blow Spun PLGA Nanofibers as a Surgical Hemostatic
A. M. BEHRENS1, M. J. SKOHRSK1, W. TUTAK1, and P. KOFINAS1
1University of Maryland, College Park, MD
2American Dental Association Foundation, Gaithersburg, MD

P – Th - A - 38
Blood Compatibility Study of Dysprosium Aerogels
D. KOLASINAC1, D. A. RUBENSTEIN1, and W. YIN1
1Oklahoma State University, Stillwater, OK

P – Th - A - 39
Effect of Decreasing Nanoparticle Size on the Adherence of Staphylococcus aureus to ZnO/PVC Nanocomposites
B. M. GELICH1 and T. WEBSTER1
1Northeastern University, Boston, MA

P – Th - A - 40
Micropatterned Sensing Hydrogels for Detecting Protease Release from Cells
K. SON1, D-S. SHIN1, T. KWA1, and A. REVZIN1
1UC Davis, Davis, CA

P – Th - A - 41
Surface-Engineered Microfluidic Substrates for Screening of Exopolysaccharide Production and Composition in Microbial Systems
R. R. HANSEN1, J. P. HINESTROSA1, J. L. MORRELL-FALVEY1, B. S. LOKITZ1, J. M. MESSMAN1, and S. T. PETTIT1
1Center for Nanophase Materials Sciences, Oak Ridge National Laboratory, Oak Ridge, TN
2Biosciences Division, Oak Ridge National Laboratory, Oak Ridge, TN
P – Th - A - 42
Transfer of Loads between Mineral and Fiber Phases in Bone
M. GHALI1, D. WOODARD2, and K. MITRA1
1Florida Institute of Technology, Melbourne, FL, 2Kennedy Space Center, Melbourne, FL

P – Th - A - 43
Implant Surface Modification with Titania Nanotubes for Enhanced Cell-Substrate Interlock
T. SHOKUHAR1
1Michigan Technological University/University of Illinois at Chicago, Houghton, MI

P – Th - A - 44
Preparation of a Nanotubular Polymer Replica for Reduced Catheter Infection
L. LIU1, T. J. WEBSTER1, and B. ERCAN1
1Northeastern University, Boston, MA

P – Th - A - 45
Novel and Inexpensive EPD Coating of Nano-HAP on Titanium-6.4 Leads to Increased Osteoblast Adhesion
G. BHARDWAJ1, D. MATHEW1, L. SUN1, T. J. WEBSTER2, and G. MANIVASAGAN1
1VIT University, Vellore, India, 2Northeastern University, Boston, MA

P – Th - A - 46
Micropatterning of Polyvinyl Alcohol to Enhance Adhesion of Vascular Endothelial Cells
S. GOH1,2, G. POHAN1, M. F. CUTFONGCO3, C. LE VISAGE4, H. LOU3,4, and E. K. YIM3,4
1Institute of Materials Research and Engineering, Singapore, Singapore, 2National University of Singapore, Singapore, Singapore, 3INSERM U766, Paris, France, 4Singapore University of Technology and Design, Singapore, Singapore, 5Mechanobiology Institute Singapore, Singapore, Singapore

P – Th - A - 47
Living Vaccine Factories: Alginate Microcapsules for a Cell-Based HIV-1 Vaccine
H. R. BENNET1, J. PHAN1, and K. A. WOODROW1
1University of Washington, Seattle, WA

P – Th - A - 48
Controllable Pore Growth in Degradable Orthopedic Fixation Device mMaterial
S. M. DEVLIN1 and P. I. LEIKES1
1Temple University, Philadelphia, PA

P – Th - A - 49
Effective Myogenic Commitment of Stem Cells on Graphene Oxide Immobilized Micro-Patterned Substrates
A. LEE1, S-Y. KWAK1, Y.S. LEE1, J-H. KIM1, and N. HWANG1
1Seoul National University, Seoul, Korea, Republic of, 2Hanyang University, Ansan, Korea, Republic of

P – Th - A - 50
Mouse Myoblast Alignment on 2D Wavy Patterns: Dependence on Feature Size and Cell-Cell Interaction
M. GRIGOLA1 and J. HSIA2
1University of Illinois, Urbana, 2University of Illinois, Urbana, IL

Track: Cancer Technologies

Bioengineering Models of Cancer

P – Th - A - 51
Influence of ECM Structure on the Shear Stress Experienced by Cancer Cells during Interstitial Flow
R. ZIELINSKI1, V. SHUKLA1, and S. N. GHADIALI1
1The Ohio State University, Columbus, OH

P – Th - A - 52
SynVivo-Tumor: Microfluidic Assay For Screening Drug Delivery Systems
A. SMITH1, C. GARSON1, I. MILLS1, J. FEWELL2, M. MATARI3, B. PRABHAKARPANDIAN1, and K. PANT1
1CFD Research Corporation, Huntsville, AL, 2EGEN Inc., Huntsville, AL

P – Th - A - 53
Engineered In Vitro Microtumors of Controlled Sizes as Models for Breast Cancer
S. MUKUNDAN1, V. SANT1, and S. SANT2
1University of Pittsburgh, Department of Pharmaceutical Sciences, Pittsburgh, PA, 2University of Pittsburgh, Department of Pharmaceutical Sciences/Bioengineering, Pittsburgh, PA

P – Th - A - 54
Bioengineered Microenvironments for the Study of Human Tumor Metastasis
J. LEE1,2, F. BERSIANI3, M. YU4, D. HABER5, and B. PAREKKADAN1,2
1Massachusetts General Hospital, Harvard Medical School, Boston, MA, 2Shriners Hospital for Children, Boston, MA, 3Massachusetts General Hospital, Harvard Medical School, Charlestown, MA

P – Th - A - 55
3D Multicellular Cancer Spheroids using Antibiotics-derived hydrogels: Formation, Drug screening, and Nanoparticle Delivery
T. POTTA1, T. S. GRANDHI1, J. RAMOS1, and K. REGE1
1Arizona State University, Tempe, AZ

P – Th - A - 56
Matrix Remodeling by Breast Cancer Adipose Stromal Cells Modulates Tumor Vascularization
Y. SONG1, S. SHÔN2, B. SEK1, A. D. STROOCK1, and C. FISCHBACH1
1Cornell University, Ithaca, NY

P – Th - A - 57
Migration of Metastatic Triple Negative Breast Cancer Cells is Strongly Inhibited by Novel Natural Compounds
S. NASROLAI1 and H. TAVANA1
1University of Akron, Akron, OH

P – Th - A - 58
Three Dimensional Model of the Ovarian Cancer Microenvironment
G. V. ORSINGER1, J. D. WILLIAMS1, and M. ROMANOWSKI1
1University of Arizona, Tucson, AZ

P – Th - A - 59
Biomaterials-Based Prostate Cancer Xenografts to Study Tumorigenesis and Dormancy Escape
T. J. LONG1, C. C. SPRENGER1, S. R. PLYMATE1,2, and B. D. RATNER1
1University of Washington, Seattle, WA, 2Veterans Affairs Puget Sound Health Care System, Seattle, WA

P – Th - A - 60
Multiscale Simulation of the Transport and Adhesion of Tumor Cell Aggregates in the Circulation
K. J. ANDERSON1, A. DE GUILLAUBON1, Y. GENG1, A. D. HUGHES1, W. WANG1, and M. R. KING3
1Cornell University, Ithaca, NY

P – Th - A - 61
Study of Angiogenic Sprouting in a Multicellular 3D Tumor Model
M. GADDE1, C. S. SZOT1, and M. N. RYLANDER1
1Virginia Polytechnic Institute and State University, Blacksburg, VA

P – Th - A - 62
A Novel Engineered Platform to Evaluate Cancer Metastasis
C. ZHANG1, E. SHIEN1, L. BLAHA1, B. RYU1, R. ALAN1, M. CABDO1, and J. WONG1
1Boston University College of Engineering, Boston, MA, 2Boston University School of Medicine, Boston, MA
Quantitative Analysis of Contact Inhibition of Locomotion During Fibrillar-like Migration
A. R. ASTHAGIRI and D. F. MILANO
Northwestern University, Boston, MA

Interstitial Fluid Pressure Modulates Gene Expression in Engineered Breast Tumors
A. S. PIOTROWSKI, J. TIEN, and C. M. NELSON
Chemical and Biological Engineering, Princeton University, Princeton, NJ

Microfluidic Devices for Studying Intermittent Hypoxia Response in Cancer
M. ACOSTA, X. JIANG, P.-K. HUANG, C. GRANT, G. WALKER, and M. GAMSKI
North Carolina State University, Raleigh, NC

Tissue Macrophages Enhance Vessel Network Formation in 3D Collagen Scaffold
M. COX and S. VERBRIIDGE
Virginia Tech, Blacksburg, VA

A Microfluidic Approach to Breast Cancer Metastasis under Variable pO2 Levels
X. JIANG, M. ACOSTA, P.-K. HUANG, C. GRANT, G. WALKER, and M. GAMSKI
North Carolina State University, Raleigh, NC

Glioma Metabolic Evolution In An Engineered Physiological Model
J. IVEY, C. FISCHBACH, and S. VERBRIIDGE
Cornell University, Ithaca, NY

The Interaction of Breast Cancer and Dendritic Cells on the Lymphatic Endothelium
G. CALDERON and D. KHISMATULLIN
Tulane University, New Orleans, LA

Drug Response of Cancer Cell Spheroids in 3D Collagen Gels
B. FALLICA, J. MAFFEI, and M. ZAMAN
Boston University, Boston, MA

Engineering a Three-dimensional Microfluidic Cell Culture Platform for Cancer Research
A. BRUCE, B. HINDMAN, R. WYSOLMERSKI, and Y. YANG
West Virginia University, Morgantown, WV

Nanoparticle Transport and Tumor Cell Migration Simulation using a Multi-Scale Approach
S. J. BOUKHRIS, R. A. VALENCE, and Y. FENG
The University of Texas at San Antonio, San Antonio, TX

Roles of Endogenous Electric Field on the Invasion of Glioblastoma Cells
Y.-J. HUANG and P. SEARSON
Johns Hopkins University, Baltimore, MD

Polymeric Aqueous Biphasic Engineering of High Throughput Cancer Cell Spheroid Microtechnology for Drug Screening
E. ATEF and H. TAWANA
University of Akron, Akron, OH

High-Affinity Multiepitopic Antibodies Block Tumor Growth by Inhibiting EGFR-Dependent Signaling
M. S. SANTOS and K. D. WITTRUP
Massachusetts Institute of Technology, Cambridge, MA

Cold Non-thermal Atmospheric Plasma:A Novel Metastatic Breast Cancer Therapy
M. WANG, B. HOLMES, X. CHENG, M. KEIDAR, and L. G. ZHANG
The George Washington University, Washington, DC

Ablation of Aggressive Thyroid Cancer Cells with HIFU and Ethanol
S. RATNAYAKA, N. HOANG, K. TSUMAGARI, E. KANDIL, and D. KHISMATULLIN
Tulane University, New Orleans, LA
P – Th - A - 85
2- and 3-Dimensional Electrotaxis Migration of Human Brain Cancer Cell Line Population In Vitro
J. G. LYON,1 A. VAKHARIA,2 and R. V. BELLAJKONDA1
1Georgia Institute of Technology, Atlanta, GA

P – Th - A - 86
Image-Based Analyses Identify Angiogenic Cell Phenotypes
D. T. RYAN,1 B. L. LONGI,1 R. J. ZAUNBRECHER1, and A. A. QUTUB1
1Rice University, Houston, TX

P – Th - A - 87
The Interplay of Growth and Migration of Cancer Cells in Tumor Growth Dynamics and Invasion
A. M. JIMENEZ1, O. M. YOGURTCU1, M-H. LEE1, P-H. WU1, S. X. SUN1, and D. WIRTZ2
1Johns Hopkins University, Baltimore, MD

Track: Cardiovascular Engineering

Cardiac Electrophysiology

P – Th - A - 88
Deconvolving Electromgrams of Atrial Fibrillation from Intra-cardiac Electrode Arrays
K. B. PALMER1, N. C. THOMPSON1, P. S. SPECTOR1, and J. H. BATES1
1University of Vermont, Burlington, VT

P – Th - A - 89
Reduced-Order Finite Element Bidomain Modeling of Cardiac Propagation
D. H. YU1 and K. T. NG1
1New Mexico State University, Las Cruces, NM

P – Th - A - 90
Semi-implicit Adaptive Mesh Refinement for Realistic Bidomain Modeling of Cardiac Propagation
M. A. FUNK1 and K. T. NG1
1New Mexico State University, Las Cruces, NM

P – Th - A - 91
Preconditioning and Ionic Current Modeling for Element Free Simulation of Cardiac Propagation
I. STURDEVANT1 and K. T. NG1
1New Mexico State University, Las Cruces, NM

P – Th - A - 92
Abrupt Expansion Induced Reentry Observed with Multielectrode Arrays
Z. WANG1, H. YANG1, N. ERDMAN1, T. K. BORG1, and B. Z. GAO1
1Clemson University, Clemson, SC, 2Medical University of South Carolina, Charleston, SC

P – Th - A - 93
Memory in Restitution of Action Potential Duration in Mouse Ventricles
Y. ZHAO1, K. BROWNSON1, and A. PATWARDHAN3
1University of Kentucky, Lexington, KY

P – Th - A - 94
The Latency-Dependent Beat Relationship: Two mechanisms at Play?
A. GREER-SHORT1, M. HEIDINGER1, and S. POELZING1
1Virginia Tech Carilion Research Institute, Roanoke, VA, 2University of Utah, Salt Lake City, UT

P – Th - A - 95
Improving Shock Delivery in Cardioversion and Defibrillation
P. PODDAR1, M. CHEN1, A. CHANG1, S. SUBRAMANIAN1, P. MALAMAS1, J. EOH1, K. GEORGE1, and R. MALPI1
1Johns Hopkins University, Baltimore, MD

Track: Cardiovascular Engineering

Cardiac Regeneration

P – Th - A - 96
An Implantable Means to Elucidate Heart Regeneration in Zebrafish
H. CAD1, F. YU1, Y. ZHAO1, Y-C. TAI1, and T. HSIAI1
1USC, Los Angeles, CA, 2Caltech, Pasadena, CA

P – Th - A - 97
Fetal Cardiac Extracellular Matrix Promotes Adhesion and Expansion of Neonatal Cardiomyocytes
C. WILLIAMS1 and L. D. BLACK1
1Tufts University, Medford, MA

P – Th - A - 98
A Cardiac Patch for Delivering Therapeutic Stem Cells to the Heart Following Myocardial Infarction
M. MEHREMI1, T. JENSEN1, J. JONAS1, V. CHAN1, L. KNAPP1, R. BASH1, H. KONG1, and L. SCHO0K1
1University of Illinois, Urbana, IL

Track: Device Technologies and Biomedical Robotics

Cardiac Stem Cells

P – Th - A - 99
Enhanced Structural Maturation of Human Pluripotent Stem Cell-Derived Cardiomyocytes Induced by Nanogrooved Culture Substrata
H. J. LEE1, J. R. MACADANGDANG1, L. M. PABON1, J. A. FUGATE1, C. E. MURRY1, and D-H. KIM1
1University of Washington, Seattle, WA

P – Th - A - 100
A Perivascular Stem Cell Network Within Human Adult Thoracic Aorta
B. R. GREEN1, V. S. DONENBERG2, M. A. ESKAV2, A. D. DONENBERG2, M. E. PFEIFER2, T. G. GLEASON2, and J. A. PHILLIPS2
1University of Pittsburgh Medical Center, Pittsburgh, PA, 2University of Pittsburgh, Pittsburgh, PA

Track: Cardiovascular Engineering

Cardiovascular Assist Devices

P – Th - A - 101
Flow Dynamics in the Aortic Root of the LVAD-assisted Heart
I. LING1, Z. MOYEDI1, Y. K. WONG1, W. DEMBITSKY1, R. ADAMSON1, and K. MAY-NEWMAN1
1San Diego State University, San Diego, CA, 2Sharp Memorial Hospital, San Diego, CA

P – Th - A - 102
Degree of Radial Expansion Dictates Resorbable Vascular Scaffold Performance
J. FERDOUS1, N. FATEMATUZZAHAN1, and T. SHAZLY1
1University of South Carolina, Columbia, SC

P – Th - A - 103
The Effects of Hematocrit and Rotation Time on Platelet Adhesion to a Polyurethane Urethane Surface
L. GRUENENWALD1, J. TAYLOR1, M. SLATTERY1, S. DEUTSCH1, C. A. SIEDLECKI1,2, and K. B. MANNING1,2
1The Pennsylvania State University, University Park, PA, 2Penn State Hershey Medical Center, Hershey, PA

P = Poster Session
OP = Oral Presentation
### Track: Cardiovascular Engineering

#### Microvascular Flow

**P – Th - A - 104**

LVAD-Integrated ExVivo Arterial Perfusion System  
M. J. BULLER1, G. A. GIRIDHARAN1, M. A. SOBIESKI1, M. S. SLAUGHTER1, S. C. KÖNIG1, and K. G. SOUCY1  
1University of Louisville, Louisville, KY

**P – Th - A - 105**

Cardiac Pacing Using Low Intensity Focused Pulsed Ultrasound: Preliminary Findings  
G. SAAVEDRA1, L. RODRÍGUEZ1, and E. JUAN1  
1University of Puerto Rico at Mayagüez, Mayagüez, PR, Puerto Rico

**P – Th - A - 106**

Selective Vascular Blockage by Multiphoton Laser Ablation Causes Flow-Induced Remodeling in Tumor Blood Vessels  
G. GRUINU2, L. GRUINU2, D. BAZOU1, and L. MUNN1  
1Massachusetts General Hospital and Harvard Medical School, Charlestown, MA, 2University of Craiova, Craiova, Romania, 3Massachusetts General Hospital and Harvard Medical School, Charlestown, MA

**P – Th - A - 107**

Endothelial Surface Glycocalyx Can Regulate Flow-induced Endothelial NO Production in the Microvessel  
W.Y. YEN1, J. YANG1, M. ZENG1, J. M. TARBELL1, and B. M. FU1  
1Department of Biomedical Engineering, The City College of New York, New York, NY

**P – Th - A - 108**

Two- and Three-Dimensional Human Microvascular Models for Immunoregulation Research  
H. M. LAURIDSEN1, B. J. WALKER1, S. P. GALARZA1, and A. L. GONZALEZ1  
1Yale University, New Haven, CT

### Track: Cardiovascular Engineering

#### Vascular Mechanics

**P – Th - A - 109**

Stochastic Regulation of the Contractile Phenotype of Primary Bovine Vascular Smooth Muscle Cells  
E. BARTOLAK-SUKI1, J. IMISIROVIC1, and B. SUKI1  
1Boston University, Boston, MA

**P – Th - A - 110**

Syndecan-1 Regulates Mechanotransduction Pathways in Endothelial Cells in Response to Shear Stress  
P. L. VOYYODIC1, D. MIN1, R. LIU1, E. WILLIAMS1, and A. B. BAKER1  
1The University of Texas at Austin, Austin, TX

**P – Th - A - 111**

A Novel Rat Carotid Artery Grafting Model for Studying Artery Buckling In Vivo  
Q. LIU1, J. ZHANG1, and H-C. HAN1  
1University of Texas, San Antonio, TX, 2XiShan Hospital, Fourth Military Medical University, Xi'an, China, People's Republic of

**P – Th - A - 112**

Characterization of Bioeffects of Acoustic Droplet Vaporization at 3.5MHz on Endothelial Cells  
R. SEDA1, J. B. FOWLE1, and J. L. BULL1  
1University of Michigan, Ann Arbor, MI

**P – Th - A - 113**

Smooth Muscle Cell Biomechanics and Matrix Remodeling in Bicuspid Aortic Valve-Associated Aortopathy  
J. A. PHILLIPPI1, B. R. GREEN2, M. A. ESKAY1, F. LANN1, C. NG1, A. S. NAIN1, and T. G. GLEASON1  
1University of Pittsburgh, Pittsburgh, PA, 2University of Pittsburgh Medical Center, Pittsburgh, PA, 3Virginia Tech, Blacksburg, VA

**P – Th - A - 114**

A Flexible System for Studying Mechanical Stretch Waveform-Mediated Signaling in Vascular Cells  
J. LEE1, M. WONG1, Q. SMITH1, and A. BAKER1  
1University of Texas at Austin, Austin, TX

**P – Th - A - 115**

Identification of Novel Mechanosensitive, Inflammatory Genes in Endothelium By Combined Mouse Gene Array and Functional Drosophila siRNA Screening  
I. JAMI1, J. C. KIM2, D. SD1, S. KUMAR1, and H. JO1,2  
1Emory University & Georgia Institute of Technology, Atlanta, GA, 2Ewha Womans University, Seoul, Korea, Republic of

**P – Th - A - 116**

Transmural Flow Controls the Location and Direction of Angiogenic Sprouts  
P. GALI1 and C. CHEN1  
1University of Pennsylvania, Philadelphia, PA

### Track: Cardiovascular Engineering

#### Cardiovascular Flow Modeling

**P – Th - A - 117**

Numerical Simulation of Hemodynamics in a Compliant Helical-type Artery Bypass Graft  
J. WEN1, Y. FAN1, and T. ZHENG1  
1Sichuan University, CHENGDU, China, People's Republic of, 2Beihang University, Beijing, China, People's Republic of

**P – Th - A - 118**

A Mathematical Model of the Influence of Intra-abdominal Pressure on the Cardiovascular System  
J. H. VAN OOSTROM1, M. BOER1, and A. GABRIELLI1  
1University of Florida, Gainesville, FL, 2Twente University, Enschede, Netherlands

**P – Th - A - 119**

Effect of the Superior Vena Cava Placement in the Y-graft Fontan for Single Ventricle Congenital Heart Defects  
A. C. CROUCH1, M. C. RESTREPO1, C. M. HAGGERTY1, K. R. KANTER1, T. C. SLESNICK2, J. ROSSIGNAC1, T. L. SPIR1, M. A. FOGEL2, and A. P. YOGANATHAN1  
1Georgia Institute of Technology, Atlanta, GA, 2Emory University School of Medicine and Children's Healthcare of Atlanta, Atlanta, GA, 3Children's Hospital of Philadelphia, Philadelphia, PA

**P – Th - A - 120**

Prestressed Fluid-Structure Interaction Model of the Aortic Root  
V. FLAMING1 and B. E. GRIFFITH1  
1Polytechnic Institute of New York University, Brooklyn, NY, 2New York University School of Medicine, New York, NY
P – Th - A - 121
Fluid-Structure Interaction Model of Aortic Dissection Driven by Fluid Forcing
V. Flaminì,2, G. Holzapfel2, A. Deanda3, and B. Griffith1
1Polytechnic Institute of New York University, Brooklyn, NY, 2Graz University of Technology, Graz, Austria, 3Royal Institute of Technology, Stockholm, Sweden, 4New York University School of Medicine, New York, NY

P – Th - A - 122
Hemodynamic Impact of the Anatomical Differences between the Lateral Tunnel and Extra-Cardiac Fontan Connections
M. S. Mundkur,1 M. Restrepo1, E. Tangan,1 C. M. Haggerty1, M. A. Fogel1, A. M. Valente1,2, B. B. McElhinney1,2, and A. P. Yoganathan3
1Georgia Institute of Technology, Atlanta, GA, 2Children’s Hospital of Philadelphia, Philadelphia, PA, 3Children’s Hospital Boston, Boston, MA

P – Th - A - 123
Distortions of Pressure Drop Measurement Using Fluid-Filled Double-Lumen Catheter
O. Rotman,1, U. Zaretzki,1 A. Shitzer1, and S. Einar1
1Tel-Aviv University, Tel-Aviv, Israel, 2Technion, Haifa, Israel

P – Th - A - 124
Intraventricular Vortex Flow in Non-Ischemic Dilated Cardiomyopathy
J. Bermejo1, Y. Benito1, M. Alhama1, R. Yotti1, P. Martinez-Legazpi1, C. Perez del Villar1, E. Perez-David1, A. Gonzalez-Mansilla1, C. Saino-Martina1, A. Barrio1, F. Fernandez-Avilés1, and J. Del Alamo1
1Hospital General Universitario Gregorio Marañón, Madrid, Spain, 2University of California San Diego, San Diego, CA, 3Universidad Nacional de Educacion a Distancia, Madrid, Spain

Track: Device Technologies and Biomedical Robotics

Cardiovascular Flow Modeling
P – Th - A - 125
Impact of Stent Mis-sizing and Mis-positioning on Coronary Endothelial Shear and Intramural Stress
H. Y. Chen1, B-K. Koo2, D. L. Bhatt2, and G. S. Kassab2
1Indiana Univ. Purdue Univ. Indianapolis, Indianapolis, IN, 2Seoul National University Hospital, Seoul, Korea, Republic of 3Harvard Medical School, Boston, MA

Track: Device Technologies and Biomedical Robotics

Biomedical Robotics
P – Th - A - 126
Design and Development of Robotic Surgical Unit To Provide Force Feedback to the Surgeon
J. M. Desai1, D. Capelleri1, A. Valdevit1, and A. Ritter1
1Stevens Institute of Technology, Hoboken, NJ

Track: Device Technologies and Biomedical Robotics

Biosensors
P – Th - A - 127
Fabrication of Sol-gel-based Miniature pH Sensors within Microfluidic Devices
C. M. Nguyen1, I. Gurung1, S. Rao1, and J-C. Chiao1,2
1UT Arlington, Arlington, TX, 2UTSW Medical Center of Dallas, Dallas, TX

P – Th - A - 128
Injectable/Moldable Optical Biosensors: Microporous Alginate Hydrogels as a Platform for Glucose Sensing
J. R. Roberts1 and M. McShane1
1Texas A&M University, College Station, TX

P – Th - A - 129
Layer-By-Layer Assembly of Linear Polyethyleneimine Redox Polymer Films
J. L. Deluca1 and D. W. Schmidte2
1University of Oklahoma, Norman, OK

P – Th - A - 130
Reducing the Power Consumption of Biochemical Measurements for Wireless Applications
A. N. Amos1,2, J. G. Roberts1, L. Qi1, L. A. Sombers1, and G. S. McCarty1,2
1North Carolina State University, Raleigh, NC, 2University of North Carolina at Chapel Hill, Chapel Hill, NC

P – Th - A - 131
A Novel Microfluidic Apatasensor using 3-D printing for Thrombin Detection
S. Jahannan1, A. K. Ramasubramanian1, and L. Tang1
1UTSA, San Antonio, TX

P – Th - A - 132
Towards the Development of a Multimarker Point of Care Technology
J. T. La Belle1,2
1Arizona State University, Tempe, AZ

P – Th - A - 133
Hybrid Conducting Polymer-Hydrogel Nanofibers for Highly Sensitive Detection of Glucose
M. Abidani1 and G. B. Kim1
1Pennsylvania State University, University Park, PA

P – Th - A - 134
Activity Tracking With Smartphones: Phone Location Matters
S. A. Antos1,2, M. V. Alberti1,2, and K. P. Kording1,2
1Northwestern University, Chicago, IL, 2Rehabilitation Institute of Chicago, Chicago, IL

P – Th - A - 135
Dielectric Impedimetric Detection Method for Bacterial Biofilm Cultures under Different Growth Conditions.
J. Parejos1, S. Becerro1,2, and S. Arana1,2
1CEIT and Tecnun (University of Navarra), Donostia-San Sebastian, Spain, 2CIC microGUNE, Arrasate-Mondragón, Spain

P – Th - A - 136
SNP Detection by Modulating the Fluorescence of DNA-templated Silver Nanoclusters
J. Lee1 and W. J. Kim1
1POSTECH, Pohang, Korea, Republic of

P – Th - A - 137
Development of Oxygen-sensing Films and Their Application in Biometry
A. Miyayama1, H. Uchida1, A. Sato1, and K. Tsukada1,2
1Graduate School of Fundamental Science and Technology, Keio University, Kanagawa, Japan, 2Department of Applied Physics and Physico-Informatics, Faculty of Science and Technology, Kanagawa, Japan

P – Th - A - 138
Nanoengineered Calcium Sensors for Monitoring Milk Fever in Dairy Cattle
R. Ramachandran1
1Indian Institute of Technology Bombay, Mumbai, India

P – Th - A - 139
Separation of Live and Dead E. Coli using Embedded Passivated-electrode Insulator-based Bielctrohrophoresis (EntDEP)
P. A. Zellner1, T. Shake1, A. Sahari1, B. Behram1, and M. Agah1
1Virginia Tech, Blacksburg, VA

P – Th - A - 140
Distance-Mediated Plasmonic Dimers for Reusable Colorimetric Switches
D. R. Kim1
1Nanyang Technological University, Singapore, Singapore
**Poster Session ThA**

**Poster Viewing with Authors & Refreshment Break | 9:30AM - 10:30AM**

**Poster Session ThA**

**P - Th - A - 141**
Simultaneous Measurement of pH and Bacterial Markers in a Single Sensor
H. J. SISMAE† and T. A. WEBSTER†
†Northeastern University, Boston, MA

**P - Th - A - 142**
Anti-Inflammatory Drug Releasing Conducting Polymer/Graphene Oxide Nanocomposite For Improved Dopamine Sensing
C. L. WEAVER†, L. ZHANG†, J. M. LAROSA†, and X. T. CUI†
†University of Pittsburgh, Pittsburgh, PA

**P - Th - A - 143**
In Vivo Biosensor Applications for Polymeric Nanosensors
K. J. CASH† and H. A. CLARK†
†Northeastern University, Boston, MA

**P - Th - A - 144**
Aggregation Studies of Concanavalin A in Free Solution with Dextran Glycoconjugates
A. LOCKE†, B. CUMMINGS†, and G. COTE†
†Texas A&M University, College Station, TX

**P - Th - A - 145**
Slices for Devices: Organotypic Slice Cultures for In Vitro Sensor Analyses
S. TOBIER†, C. EITEL†, D. DANDY†, R. BARTELS†, M. REYNOLDS†, T. CHEN†, and C. HENRY†
†Colorado State University, Fort Collins, CO

**P - Th - A - 146**
Rapid Detection of Adiponectin Using a Lateral Flow Assay
K. DUFFY†, P. SARKARIA†, C. ZHANG†, F. HASSAN†, J. THOMPSON†, M. SHULER†, and M. ARIARATNE†
†Cornell University, Ithaca, NY

**P - Th - A - 147**
Distance Dependent Electromagnetic Enhancement of Localized Surface Plasmon Resonance Biosensing Based on Magnetic and Gold Nanoparticles
Y. WANG† and L. TANG†
†University of Texas at San Antonio, San Antonio, TX

**P - Th - A - 148**
Wearable Biochemical Sensor to Monitor Sweat pH Change
J. DEAN†, F. ZAMBANO†, N. SERAFINO†, and M. H. LOEVB†
†The George Washington University, Washington, DC

**P - Th - A - 149**
Evaluation of Boron Doped Ultra Nanocrystalline Diamond-based Impedance Biosensor
W. ZHANG†, A. RADZADIA†, P. ARUMUGAMY†, H. ZENG†, and J. CARLISLE†
†Louisiana Tech University, Ruston, LA; ‡Advanced Diamond Technologies Inc., Romeoville, IL

**P - Th - A - 150**
Real-Time Detection of Bacterial Movement, Growth and Biofilm Formation with Surface Plasmon Resonance Imaging
P. N. ABADIAN† and E. D. GOLUCH†
†Northeastern University, Boston, MA

**P - Th - A - 151**
Selective Detection of P. aeruginosa in Bacterial Cultures
T. A. WEBSTER† and E. D. GOLUCH†
†Northeastern University, Boston, MA

**P - Th - A - 152**
A Mathematical Framework for Extracting Cell Secretion Rates from Affinity-Based Biosensors Continuously Monitoring Cell Activity
Y. GAO†, Z. MATHARU†, Y. LIU†, Q. ZHOU†, T. KWA†, and A. REZVI†
†University of California, Davis, Davis, CA

**P - Th - A - 153**
Quantification of DNA Hybridization by Fluorescence Axial Localization and Label-free Biosensing
X. ZHANG†, G. G. DAABOU†, P. S. SPHULDER†, D. S. FREEDMAN†, and M. S. ÜNLÜ†
†Boston University, Boston, MA

**P - Th - A - 154**
Improving Back-scattering Interferometry for Viral Detection
J. EVANS†, I. OLMSTED†, A. KUSKOV†, D. DUGMORE†, D. BORNHOP†, and R. HASELTON†
†Vanderbilt University, Nashville, TN; ‡Rose-Hulman Institute of Technology, Terre Haute, IN

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**Track: Nano to Micro Technologies**

**BioMEMS**

**P - Th - A - 155**
A Microfluidic D-Subminiature Connector
A. K. AU†, A. SCOTT†, E. VINCKENBOSCH†,‡, and A. FOLCH†
†University of Washington, Seattle, WA; ‡École Polytechnique Fédérale de Lausanne, Lausanne, Switzerland

**P - Th - A - 156**
Development of a Cell-Chip for Real Time Evaluation of Nanotoxicity on a Single Cell
P. SHAH† and C. LI†
†Florida International University, Miami, FL

**P - Th - A - 157**
Phase-shifted Slot Waveguide Bragg Grating Biosensors
S. SCHMIDT†, X. WANG†, J. FLUECKIGER†, S. GRIST†, J. KIRK†, K. CHEUNG†, L. CHROSTOWSKI†, and D. M. RATNER†
†University of Washington, Seattle, WA; ‡University of British Columbia, Vancouver, BC, Canada

**P - Th - A - 158**
Operational Factors Affecting Performance of MEMS-Based Ultrahigh Throughput Mechanoporation Devices
H. G. DIXIT†, D. NAMPE†, Y. ZHANG†, C. B. BALLAS†, H. TSUTSUI†, and M. P. RAO†
†University of California, Riverside, Riverside, CA; ‡Indiana University, Indianapolis, IN

**P - Th - A - 159**
Multiplex Immunoassay System Based on Suspension Array Incorporated into Microfluidic Devices
S. HAN†, H. LEE†, U. CHUNG†, and W-G. KOH†
†Yonsei University, Seoul, Korea, Republic of

**P - Th - A - 160**
Microfabrication of a Dielectrophoretic Device for High Through-Put Analysis of Single Cell Stiffness
R. LOWNES URBANO† and A. MORRIS CLYNE†
†Drexel University, Philadelphia, PA

**P - Th - A - 161**
Electronic Detection of Magnetic Post Deflection
N. TAPAIA†, K. BIELAVSKI†, and N. SNIADECKI†
†University of Washington, Seattle, WA

**P - Th - A - 162**
Size Selection of C. elegans Through a Microfabricated Filter
M. A. CORRADO†, D. J. LI†, O. CIFUGNI†, and E. E. HUI†
†University of California, Irvine, Irvine, CA

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**BMES 2013 79**
Track: Nano to Micro Technologies

Human on a Chip Systems

P – Th - A - 163
Prediction of In Vivo-Relevant Drug Disposition in a Micro-Engineered Model of the Human Liver
S. Khetani, D. Berger I, and B. Ware I
1Colorado State University, Fort Collins, CO

P – Th - A - 164
Development of Multi-Branching and Multi-Depth Endothelialized Microchannels-on-a-Chip
X. Li1, S. M. Means1, M. Martin-Green2, and Y. Liu1
1West Virginia University, Morgantown, WV; 2University of California at Riverside, Riverside, CA

P – Th - A - 165
Microfluidic Device and Assay for Mimicking the Leukocyte-Endothelium Interactions In Vivo
G. Lamberti1, B. Prabhakaran-Pandian2, A. Smith3, K. Pant3, B. Wang3, and M. F. Kiani1
1Temple University, Philadelphia, PA; 2CFD Research Corporation, Huntsville, AL; 3Widener University, Philadelphia, PA

P – Th - A - 166
Development of a Microfluidic Device to Model Human Kidney Function
C. Saxolish1, M. Reiss1, and G. Mahler1
1Binghamton University, Binghamton, NY

Track: Nano to Micro Technologies

Microphysiology Systems for Testing Drug Toxicity and Efficacy

P – Th - A - 167
Screening Combinatorial Drug Interactions on Primary Colon Cancer Stem Cells using Novel Drug-eluting Microarrays
M. Carstens1, E. Huang1, and B. Keselowsky1
1University of Florida, Gainesville, FL

P – Th - A - 168
SYN-TOX:A Microfluidic Platform For Drug Toxicity Studies
A. Smith1, C. Garson2, I. Mills3, R. Vallahadjesyyala1, B. Prabhakaran-Pandian1, and K. Pant1
1CFD Research Corporation, Huntsville, AL

P – Th - A - 169
Drug Particle Adhesion Depends on Bifurcation Angle
G. Lamberti1, A. Smith1, M. F. Kiani1, B. Prabhakaran-Pandian1, and K. Pant1
1Temple University, Philadelphia, PA; 2CFD Research Corporation, Huntsville, AL

P – Th - A - 170
Human Umbilical Vein Endothelial Cell Tube Formation Under Fluid Perfusion
C. Y. Chan1, V. N. Gorai1, P. K. Yuen1, and T. J. Huang1
1The Pennsylvania State University, University Park, PA; 2Coming Incorporated, Corning, NY

P – Th - A - 171
A Universal 3D Biochip for Interrogation of Neuro-circuitry at Single Cell Resolution
W. Li1, Z. Xu1, and P. Shi1
1City University of Hong Kong, Kowloon, Hong Kong

P – Th - A - 172
Integration of Molecular Imaging with Microwell Arrays for Rapid Assessment of Drug Response in Cancer Response in Cancer Cells
M. S. Wang1, Z. Luo1, and N. Nitin1
1University of California Davis, Davis, CA

P – Th - A - 173
Characterization of Flow Profiles and Reaction Rates in a 3D Microfluidic Cell Culture Array via Simulation
A. R. Ahmed1, Z. Dereli1, H. D. Akaydin2, and S. Wang1
1The City College of the City University of New York, New York, NY; 2Stanford University, Stanford, CA

P – Th - A - 174
Design, Fabrication and Characterization of a Microphysiological System to Study Drug Toxicity in Cardiac Tissue
A. Mathur1, P. Loskell1, B. Berg-Johansen1, N. Marks1, S. Hong1, L. Lee1, and K. Healy1
1University of California, Berkeley, CA

Track: Nano to Micro Technologies

Microprinting and Patterning of Cells and Molecules

P – Th - A - 175
Effect of Shear Rate on P-selectin Adsorption During Microfluidic Patterning
E. A. Shimp1 and D. W. Schmidtke1
1University of Oklahoma, Norman, OK

P – Th - A - 176
Controlled Toxicity Studies Using Micropatterned Cells and Nanomaterials
S. Wootley1, K. Garde1, S. Crawford1, and S. Aryanudhan1
1North Carolina A&T State University, Greensboro, NC

P – Th - A - 177
Macromolecular Imprinted Silica Particles in the Presence of Carbon Black
J. E. Rincon1, P. Almada1, F. Diaz1, and T. Boland1
1The University of Texas at El Paso, El Paso, TX

P – Th - A - 178
Hydrogel Microwell Arrays for In Situ Culture and Analysis of Single Cells
D. E. Heath1, A. R. Mohamed Sharif1, C. P. Ng1, P. T. Hammond2, L. G. Griffith2, and M. B. Chia-Park3
1Singapore-MIT Alliance for Research and Technology, Singapore, Singapore; 2Massachusetts Institute of Technology, Cambridge, MA; 3Nanyang Technological University, Singapore, Singapore

P – Th - A - 179
Laser-Based Fabrication and Patterning of Chitosan Microcapsules and Microstrands
D. M. Kingsley1, A. D. Dias1, and D. T. Coir1
1Rensselaer Polytechnic Institute, Troy, NY

P – Th - A - 180
Fabrication of Protein Dots Pattern via Template Assisted Particle Lithography
R. Li1
1University of Oklahoma, Norman, OK

P – Th - A - 181
Dielectrophoretic Cell Aggregation in Biocompatible Hydrogels
E. A. Hensley1, H. O. Fatoynbo1, M. P. Hughes1, and F. H. Labeed1
1University of Surrey, Guildford, United Kingdom
Nanobiointerfaces

**P – Th - A - 189**
Inhibition of *Candida albicans* Biofilm Formation using Nanofibrous Surface Topography

A. Kim¹, M. Kargar¹, A. Nair¹, and B. Bshkam¹
¹Virginia Tech, Blacksburg, VA

**P – Th - A - 190**
Study of Platelet Adhesion using the Novel Dynamic Layer-By-Layer Biointerface Construction

P. Lammi³, A. Genêt¹, Z. Steee¹, A. Rhyner¹, J. Malinaric¹, L. Galey¹, and M. G. Watson¹
¹LeTourneau University, Longview, TX

**P – Th - A - 191**
Role of Nanometer and Sub-Micron Surface Features on Dermal Fibroblast Adhesion to Titanium

B-W. Park¹, J. Rankenberg¹, T. Sousa¹, H. Yokoyama¹, C. Lambert², W. McGimpsey², and C. Malcuti²
¹Kent State University, Kent, OH, ²Worcester Polytechnic Institute, Worcester, MA

Layer-by-Layer Surface Modification of Colloidal Quantum Dots for Biosensor Applications

A. Nagaraja¹, A. Sooreshi¹, K. Meissner¹, and M. McShane¹
¹Texas A&M University, College Station, TX

Nanotextured Biomaterials for Stem Cell Engineering

G. Jin¹, J. Kim¹, and W. H. Suh¹
¹Temple University, Philadelphia, PA

Carbon Nanotube Thin Film via Interfacial Film-Climbing: A Potential Platform for Cell Growth

M. Patil¹, R. Goitard³, S. S. Velankari¹, and S. R. Little¹
¹University of Pittsburgh, Pittsburgh, PA

Interaction Between Adeno-associated Virus Gene Delivery Vectors and Extracellular Matrix Proteins

E. J. Gomez¹ and J. Suh¹
¹Rice University, Houston, TX
Track: New Frontiers and Special Topics

**Emerging Technologies**

**P – Th - A - 211**

A Simple, Low-cost Paper-based Assay for Measuring Blood Hemoglobin Concentration in Resource-limited Settings

X. Yang1, N. Z. Piety1, M. S. Benton1, J. Kantler1, and S. S. Shevkoplyas1

1Colorado School of Mines, Golden, CO, 1University of Colorado, Auraria, CO, 1University of California, Merced, Merced, CA, 1University of Utah, Salt Lake City, UT

**P – Th - A - 212**

Optical Coherence Tomography Enabled Tracking of Particle Motion in Evaporating Drops for Diagnostic Test Development

J. Trantum1, M. Baglia1, Z. Eagleson1, and F. Haselton1

1Vanderbilt University, Nashville, TN

**Global Health Technologies**

**P – Th - A - 213**

Design and Validation of Organic Electrochemical Transistor for EEG Application

P. Fleury2, C. Bénar3, J-M. Badier2, T. Hervé2, P. Chauvel2, and G. G. Malliaras1

1École des Mines de Saint Etienne, Gardanne, France, Metropolitain 2INSERM, Marseille 3France, Metropolitain

**P – Th - A – 214**

Nonhermetic Micropackage For Implant MEMS Systems

W. H. Ko1

1Case western reserve university, Cleveland, OH

**P – Th - A - 215**

A Transparent Conducting Polymer Device for Electronic and Optical Monitoring of Barrier Tissue

R. M. Owens1

1École Nationale Supérieure des Mines de St. Etienne, Gardanne, France

**P – Th - A - 216**

Mechanism of Electrochemical Biofilm Control and Its Applications

H. Beyenal1, S. Sultana1, and J. Babauta1

1Washington State University, Pullman, WA

**P – Th - A - 217**

Raman Scattering Microspectroscopic Examination of Intracellular Water and Trehalose in Desiccated Mammalian Cells

A. Abazari1,2, N. Chakraborthy, S. C. Hand1, and M. Toner1,2

1Massachusetts General Hospital and Harvard Medical School, Boston, MA, 2Center for Biomedical Engineering, Charlestown, MA, 3University of Michigan-Dearborn, Dearborn, MI, 4Louisiana State University, Baton Rouge, LA

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**Diagnostics**

**P – Th - A - 201**

Middle Ear Energy Absorbance of a Chinchilla Acute Otitis Media Model

X. Guan1 and R. Z. Gan1

1University of Oklahoma, Norman, OK

**P – Th - A - 202**

Energy Harvesting Using Nano Scale Dual Layers PVDF Film for Blood Artery

N. A. Fadhil1, D. S. Saber1, and P. P. Patra1

1University of Bridgeport, Bridgeport, CT

**P – Th - A - 203**

Point-of-Care Assays

A Comparison of Gold Detection Labels in Paper Based Settings

J. Wang1, W. T. Ai1, S. A. Infante1, A. R. John1, S. M. Opal1, A. W. Artenstein1,3, and A. Tripathi1

1Brown University, Providence, RI, 2Memorial Hospital of RI, Providence, RI

**P – Th - A - 204**

Subtyping Clinical Isolates of Influenza A Virus using a Simple Method to Amplify RNA Targets (SMART)

J. Wang1, W. T. Ai1, S. A. Infante1, A. R. John1, S. M. Opal1, A. W. Artenstein1,3, and A. Tripathi1

1Brown University, Providence, RI, 2Memorial Hospital of RI, Providence, RI

**P – Th - A - 207**

A Comparison of Gold Detection Labels in Paper Based Point-of-Care Assays

J. Wang1, W. T. Ai1, S. A. Infante1, A. R. John1, S. M. Opal1, A. W. Artenstein1,3, and A. Tripathi1

1Brown University, Providence, RI, 2Memorial Hospital of RI, Providence, RI

**P – Th - A - 208**

Oscillating Pressure Driven Microfluidic Bridge Networks for Point-of-Care Diagnostics

R. Jain1 and B. Lutz1

1University of Washington, Seattle, WA

**P – Th - A - 209**

Methods for Background Subtraction in High-Resolution Melting Analysis

L. N. Sanford1 and C. T. Wittwer1

1University of Utah, Salt Lake City, UT

**P – Th - A - 210**

The Effect of FVIII Deficiency on the Dynamics of Thrombin and Fibrin Generation under Flow in a Cohort of Hemophilia Patients

A. Onnagda1, K. Neeves1, J. D. Paola1, M. Manco-Johnson1, M. Wang1, K. Leidemann2, and A. Fogelson1

1Colorado School of Mines, Golden, CO, 2University of Colorado, Auraria, CO, 3University of California, Merced, Merced, CA, 4University of Utah, Salt Lake City, UT

**P – Th - A - 211**

Point-of-Treatment HIV Drug Resistance Test

N. Panpradist1, I. A. Beck2, L. M. Frenkel1,3, J. J. Lai1, and B. R. Lutz1

1University of Washington, Seattle, WA, 2Seattle Children’s Research Institute, Seattle, WA

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**P – Th - A - 202**

Energy Harvesting Using Nano Scale Dual Layers PVDF Film for Blood Artery

N. A. Fadhil1, D. S. Saber1, and P. P. Patra1

1University of Bridgeport, Bridgeport, CT

**P – Th - A - 203**

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1University of Oklahoma, Norman, OK

**P – Th - A - 204**

Subtyping Clinical Isolates of Influenza A Virus using a Simple Method to Amplify RNA Targets (SMART)

J. Wang1, W. T. Ai1, S. A. Infante1, A. R. John1, S. M. Opal1, A. W. Artenstein1,3, and A. Tripathi1

1Brown University, Providence, RI, 2Memorial Hospital of RI, Providence, RI

**P – Th - A - 205**

A Paper-based Test for Sickle Cell Disease Diagnosis in Resource-Limited Settings

X. Yang1, S. M. Vignes1, N. Z. Piety1, M. S. Benton1, J. Kantler2,3, and S. S. Shevkoplyas1

1Tulane University, New Orleans, LA, 2Sickle Cell Center of Southern Louisiana, New Orleans, LA, 3Tulane University School of Medicine, New Orleans, LA

**P – Th - A - 206**

On-Paper Purification of Nucleic Acids for Point-of-Care Applications

S. Byrnes1, B. Lutz1, L. Lafleur1, and P. Yager1

1University of Washington, Seattle, Seattle, WA

**P – Th - A - 207**

A Comparison of Gold Detection Labels in Paper Based Point-of-Care Assays

S. Rangarajan1, N. Scarr2, C. A. Holstein1, E. A. Lukhtanov1, B. Li1, C. E. Olsen1, B. Lutz1, and P. Yager1

1University of Washington, Seattle, WA, 2Etechgroup (Epoch Biosciences), Bothell, WA, 3IGE Global Research Center, Niskayuna, NY

**P – Th - A - 208**

Oscillating Pressure Driven Microfluidic Bridge Networks for Point-of-Care Diagnostics

R. Jain1 and B. Lutz1

1University of Washington, Seattle, WA

**P – Th - A - 209**

Methods for Background Subtraction in High-Resolution Melting Analysis

L. N. Sanford1 and C. T. Wittwer1

1University of Utah, Salt Lake City, UT

**P – Th - A - 210**

The Effect of FVIII Deficiency on the Dynamics of Thrombin and Fibrin Generation under Flow in a Cohort of Hemophilia Patients

A. Onnagda1, K. Neeves1, J. D. Paola1, M. Manco-Johnson1, M. Wang1, K. Leidemann2, and A. Fogelson1

1Colorado School of Mines, Golden, CO, 2University of Colorado, Auraria, CO, 3University of California, Merced, Merced, CA, 4University of Utah, Salt Lake City, UT

**P – Th - A - 211**

Point-of-Treatment HIV Drug Resistance Test

N. Panpradist1, I. A. Beck2, L. M. Frenkel1,3, J. J. Lai1, and B. R. Lutz1

1University of Washington, Seattle, WA, 2Seattle Children’s Research Institute, Seattle, WA
P – Th - A - 221
Development of a Point-of-Care High-throughput Platform for Inhibition of CA-MRSA Biofilms
A. SRIVIVASAN1, J. L. LOPEZ-RIBOY1, C. FREI1, and A. K. RAMASUBRAMANIAN1
1The University of Texas at San Antonio, San Antonio, TX, 2University of Texas Health Science Center at San Antonio, San Antonio, TX

P – Th - A - 222
Isoelectric Focusing as a Pre-Conditioning System of Paper-Based Analytical Device
K. ABE1 and P. YAGER1
1University of Washington, Seattle, WA

P – Th - A - 223
Battery-Powered Incubator for Water Quality Testing in Remote Areas
J. BARCKNECHT1, A. KOLLMAN1, J. HARVESTINE1, J. TRACEY1, W. GONWA1, and D. STAHL1
1Milwaukee School of Engineering, Milwaukee, WI

P – Th - A - 224
Total Adiponectin in Clinical and In Vitro for the Evaluation of Metabolic Dysregulations
P. I. SARKARIA1, J. M. PROF1, M. L. SHULER1, M. ARIZA-NIETO1, J. B. ALLEY2, and S. A. SAMY3
1Cornell University, Ithaca, NY, 2Guthrie Weight Loss Center, Sayre, PA, 3Guthrie Clinic, Sayre, PA

P – Th - A - 225
New Medical Equipment Donations are No More Likely to be Fully Functional Than Used Donations: An Assessment Study in Rwanda, Honduras and Cambodia
A. DAINTEN1, C. WHITTLE1, and R. MALKin1
1Robert Malkin’s Developing World Healthcare Technology (DHT) Laboratory, Duke University, Durham, NC

P – Th - A - 226
Comparison of Two Isothermal Amplification Methods for Point-of-Care Diagnostics
A. CREEC1, S. PICKERILL1, Q. YOU1, D. WRIGHT1, and R. HASELTON1
1Vanderbilt University, Nashville, TN, 2Ustar Biotechnologies Ltd., Hangzhou, China, People’s Republic of

Track: New Frontiers and Special Topics

New Frontiers and Special Topics

P – Th - A - 227
A Microstructural Investigation of Lyopreserved Mammalian Cells Using Atomic Force Microscopy
J. LI1, D. RENARD1, K. N. BANDYOPADHYAY1, and N. CHAKRABORTY1
1University of Michigan Dearborn, Dearborn, MI

Track: Personalized Medicine

Personalized Medicine

P – Th - A - 228
Human Omental Adipose Derived Mesenchymal Stem Cells microRNA Characterized to be used with Physiologically Based Microfluidic Devices
C. ZHANG1, M. SHULER1, and M. ARIZA1
1Cornell University, Ithaca, NY

Track: New Frontiers and Special Topics

Smart Materials and Devices

P – Th - A - 229
ECG Monitoring Brassiere Sensor System using Native Wires as Electrodes for Pervasive Healthcare
S. KVD1, J. KIM1, and K. PARK1
1Seoul National University, Seoul, Korea, Republic of

P – Th - A - 230
Mechanics of Smart Needle within Tissue
N. V. DATLA1, T. K. PODDER1, Y. YU1, A. DICKER1, and P. HUTAPEA1
1Temple University, Philadelphia, PA, 2Case Western Reserve University, Cleveland, OH
3Thomas Jefferson University, Philadelphia, PA

P – Th - A - 231
Development of Motion Artifact Free Pulse Oximeter Based on Camera
J. LEE1, Y. NAM2, C. JEOG2, S-C. JOO3, and K. YOON3
1Wonkwang University School of Medicine, Iksan, Korea, Republic of, 2Worcester Polytechnic Institute, Worcester, MA, 3Wonkwang University, Iksan, Korea, Republic of

Track: Orthopaedic and Rehabilitation Engineering

Orthopaedic Bioengineering: Bone and Cartilage

P – Th - A - 232
In Vitro Generated Bone-like Tissue Using Wharton’s Jelly Morsels
B. ENGBRETSION1 and V. I. SIKAVITAS1
1University of Oklahoma, Norman, OK

P – Th - A - 233
Mechanical Stimulation of a Healing Fracture Using a Mouse Model
J. A. CURREY1, E. MILLER1, S. DAY1, and M. MANCUSO1
1Union College, Schenectady, NY, 2Rensselaer Polytechnic Institute, Troy, NY

P – Th - A - 234
Perfusion Bioreactor Enhances Cryoprotective Agent Permeation into Intact Porcine Articular Cartilage
Q. M. ISMAIL1, W. DAHL1, K. G. BROADBANK1, E. D. GREENE1, and T. M. WICK1
1University of Alabama at Birmingham, Birmingham, AL, 2Washington University in St. Louis, St. Louis, MO, 3Cell and Tissue Systems, Inc., North Charleston, SC

P – Th - A - 235
Finite Element Modeling of Bone Cutting Processes Using Arbitrary Lagrangian Eulerian Adaptive Meshing
E. MACDONALD1 and S. R. SCHMID1
1University of Notre Dame, Notre Dame, IN

P – Th - A - 236
The Anabolic Effects of Electrical Stimulation on Endochondral Bone Formation
S. LABABIDI1, R. WILLI1, D. NOJAK1, R. RAZMPOUR1, R. FITZGERALD1, W. LANDIS1, D. WEINER1, and F. SAFAD1
1NEOMED, Rootstown, OH, 2University Of Akron, Akron, OH, 3Temple University, Philadelphia, PA, 4Summa Hospital, Akron, OH, 5Akron Children’s Hospital, Akron, OH
Track: Orthopaedic and Rehabilitation Engineering

Orthopaedic Bioengineering: Tissue Interfaces and Ligaments

P – Th - A - 237
Stress Concentration and Fracture Risk Depends on Fiber Orientation Relative to a Defect in Fiber-Reinforced Tissue
J. M. PELOQUIN1 and D. M. ELLIOTT2
1University of Pennsylvania, Philadelphia, PA, 2University of Delaware, Newark, DE

Orthopaedic Bioengineering: Spine and Vertebrae

P – Th - A - 238
Height Restoration Therapy in Enzymatically Degraded Young Bovine Lumbar Intervertebral Discs
E. A. GROWNLEY KALA1 and J. G. BLEDSOE1
1Parks College of Engineering, Aviation and Technology, St Louis, MO

P – Th - A - 239
Injectable Riboflavin-Crosslinked Collagen Gels for Annulus Fibrosus Repair
B. H. BORDE1, P. GRUNERT2, M. MACIELAK2, R. HÄRTL3, and L. BONASS3
1Cornell University, Ithaca, NY, 2Weill Cornell Medical College, New York, NY

P – Th - A - 240
Age Dependent Thoracic Vertebral Morphology in the Adolescent Population
J. R. PETERS1, C. CHANDRASEKARAN1, L. WALTZ2, and S. BALASUBRAMANIAN3
1Drexel University, Philadelphia, PA

P – Th - A - 241
Effect of Pro-Inflammatory Cytokines on the Axonal Outgrowth from Adult Rat Dorsal Root Ganglia In Vitro
H. KIM1, T. W. CASPAR1, S. B. SHAH2, and A. H. HSIEH1,3
1University of Maryland, College Park, MD, 2University of California, San Diego, CA, 3University of Maryland, Baltimore, MD

P – Th - A - 242
MRI Compatible Rat-Tail Distraction Device
K. BOOSEN1 and K. R. BACHUS2
1University of Utah, Salt Lake City, UT

Track: Orthopaedic and Rehabilitation Engineering

Osteoarthritis

P – Th - A - 243
Relating Osteoarthritis Biomarkers Collected via Magnetic Harvesting to the Initial Concentration of the Biomarker Within Synovial Fluid
E. YARMOLA1, Z. KAUFMAN1, B. KOZISSION2, D. ARNOLD1, J. DOBSON1, and K. D. ALLEN1
1University of Florida, Gainesville, FL

P – Th - A - 244
Extraction of Biomarkers from Synovial Fluid Using Magnetic Nanoparticle Harvesting - Practical Validation of a Theoretical Model
B. KOZISSION1, Z. A. KAUFMAN1, E. YARMOLA1, D. P. ARNOLD1, K. D. ALLEN1, and J. DOBSON1
1University of Florida, Gainesville, FL

Track: Orthopaedic and Rehabilitation Engineering

Synergistic Effects of Lactoferrin and Xylitol on Osteoblast Maturation
L. ACTIS1, A. SRINIVASAN2, A. RAMASUBRAMANIAN3, and J. ONG1
1University of Texas at San Antonio, San Antonio, TX

Track: Orthopaedic and Rehabilitation Engineering

Rehabilitation Engineering

P – Th - A - 246
Mechanical and Cytotoxicity Testing of Acrylic Bone Cement Embedded with Microencapsulated 2-Octyl Cyanoacrylate
A. BROCHU1, O. MATTHYS1, G. EVANS2, and W. REICHERT3
1Duke University, Durham, NC

P – Th - A - 247
Impact of Healthcare Services and Rehabilitation Technologies on Life Quality of Children with Motor Disabilities in Secluded Areas in Mexico
D. COMANDORI1, J. M. DE SANTIAGO1, E. A. BRAVO1, and K. D. BUSTAMANTE1,2
1ITESM, Chihuahua, Mexico, 2Marquette University, Milwaukee, WI

High Intensity Pressure Wave Transmission in Human Ear: A Three Dimensional Nonlinear Finite Element Simulation Study
T. HAYA1 and R. Z. GAN2
1The University of Oklahoma, Norman, OK

P – Th - A - 249
MotionTalk: Kinect-based Rehabilitation System for Patients with Traumatic Brain Injury
J. VENUGOPALAN1,2, C. CHENG1, T. H. STOKES1,2, C. KADDY1, and M. D. WANG1,2
1Georgia Institute of Technology, Atlanta, GA, 2Emory University, Atlanta, GA

P – Th - A - 250
Evaluation of Joint Angle Coordination Pattern in a New Moving System with Gait Rehabilitative Training Assistance
D. LIM1, B. LEE1, L. SOND1, K. CHUNG1, H. JUNG1, K. JANG1, and K-Y. LEE1
1Sejong University, Seoul, Korea, Republic of, 2Korea Institute of Industrial Technology, Cheonan, Korea, Republic of, 3Korea National Rehabilitation Center, Seoul, Korea, Republic of

P – Th - A - 251
Development of Controlled Electromagnetic Stimulation System for Patients with Vocal Fold Paralysis
W. G. BURKS3, M. THAN2, P. JARAMILLO2, and A. LEONESSA4
1Virginia Tech, Blacksburg, VA

P – Th - A - 252
Fabricating Prosthetic Sockets with Rapid Prototyping Technology<1>
B. ROBILLARD1, O. KOMOLAFE1, R. CALDWELL1, and S. FATONE1
1Northwestern University, Chicago, IL

P – Th - A - 253
Prosthetics for the Developing World
K. P. KEENANAN
1Johns Hopkins University, Baltimore, MD

P – Th - A - 254
Development of a Control System for a Power Wheelchair Trainer
S. J. Hildebrand1, L. K. Kenyon1, and J. P. Farr1
1Grand Valley State University, Grand Rapids, MI
Track: Orthopaedic and Rehabilitation Engineering

Tissue Response to Mechanical Loading

P – Th - A - 255
The Alterations of Gene Expressions of Osteogenic Growth Factors and Transcription Factors in Response to Dynamic Hydraulic Stimulation
M. HU1 and Y-X. QIN1
1Stony Brook University, Stony Brook, NY

P – Th - A - 256
A First Study of the Mechanical Behavior of the Swine Sacrospinous Ligament
W. BECKER1, K. COMER1, K. HALE1, and R. DE VITA1
1Virginia Tech, Blacksburg, VA

P – Th - A - 257
Effects of -amino-nitrite and Exercise on Type I Collagen Morphology in Murine Bone
M. A. HAMMOND1 and J. M. WALLACE1,2
1Purdue University, West Lafayette, IN; 2Indiana University - Purdue University Indianapolis, Indianapolis, IN

P – Th - A - 258
Mechanical Damage of Tympanic Membrane in Relation to Impulse Pressure Waveform in Chinchilla
R. GAI1, D. NAKMALI1, Z. YOKEI1, and X. GUANI1
1University of Oklahoma, Norman, OK

P – Th - A - 259
Mechanical Fluid Pressure Regulated Muscle Fiber in a Rat Disuse Model
M. LIEN1, M. TEERATANANON1, M. HU1, and Y-X. QIN1
1Stony Brook University, Stony Brook, NY

P – Th - A - 260
Receptor Activator of Nuclear Factor Kappa-B Ligand Produced by Ultrasound Stimulation Enhances Osteogenesis of Mesenchymal Stem Cells
C-Y. CHU1,2, T-L. TSAI1, R. J. VANDERBY1, G. BRADICA1, S-L. LOU1, and W-J. LI1
1Chung Yuan Christian University, Chung Li, Taiwan; 2University of Wisconsin-Madison, Madison, WI

P – Th - A - 261
Dynamic Compression Bioreactor System Demonstrates Convection Enhanced Transport of TNF into Large Animal Intervertebral Discs
B. WALTER1,2, M.LIKHTMANNKUL1, Y. BORISOV1, P. NASSER1, and J. IATRIS1
1Cath School of Medicine at Mount Sinai, New York, NY; 2The City College of New York, New York, NY

P – Th - A - 262
Mechanotransduction in Mouse Models - The Effect of Mechanical Loading on the Ulna
A. VANDER MOREN1, H. HOTALING1, B. WILLIAMS2, B. ASHBY1, and T. BURGERS2
1Grand Valley State University, Grand Rapids, MI; 2Loyola University, Chicago, IL

P – Th - A - 263
Location-Dependent Tensile Properties of the Swine Uterosacral-Cardinal Ligament Complex
T. TAN1, F. M. DAVIS1, S. NICEWONDER1, J. C. MASSENGILL1, D. D. GRUBER1, and R. DE VITA1
1Virginia Tech, Blacksburg, VA; 2Walter Reed National Military Medical Center, Bethesda, MD

Track: Stem Cell Engineering

Cell Delivery Technologies

P – Th - A - 264
Hydrogel Delivery Improves Distribution of Transplanted Retinal Stem Cells
V. NGUYEN HU1, J. LUO1, J. ZHAO1, A. ALMUTAIRI1, and K. ZHANG1
1University of California, San Diego, La Jolla, CA

P – Th - A - 265
Surface Immobilization of P-Selectin Glycoprotein Ligand-1 on Mesenchymal Stem Cells Enables Selectin Mediated Cell Tethering and Rolling
C. Y. LO1, A. ANTONOPOULOS1, A. DELL1, S. HASLAM1, T. LEE1, and S. NEELAMEGHAM1
1The State University of New York at Buffalo, Buffalo, NY; 2Imperial College, London, United Kingdom

P – Th - A - 266
Development of an Engineered Nanoparticle System to Increase Adipose Stem Cell Survival
D. Y. SANITESTEBAN1, E. CHUNG1, A. S. HANNAH1, L. J. SUGGS1, and S. EMELIANOV1
1The University of Texas at Austin, Austin, TX

Director Stem Cell Differentiation

P – Th - A - 267
Primary Cilia on the Differentiating Adipose Derived Stem Cell: Investigating Regenerative Mechanisms on the Cell Level
J. C. BOOLE1,2, R. B. WILLIAMS3, I. R. VELAND4, S. T. CHRISTENSEN4, and E. G. LOBO5,6
1North Carolina State University/University of North Carolina - Chapel Hill, Raleigh, NC; 2University of Copenhagen, Copenhagen, Denmark; 3North Carolina State University, Raleigh, NC

P – Th - A - 268
Cell Culture Environments with High Cell-Cell Contact Enhance Neural Stem Cell Viability
M. E. BOUTIN1 and D. HOFFMAN-KIM1
1Brown University, Providence, RI

P – Th - A - 269
Integration of Predictive Computational Modeling and Biomechanical Microengineering of Stem Cells to Elucidate and Enhance Lineage Specific Differentiation
A. PAUL1, D. FRANZ1, S. YAHYA1, S. SUN1, and M. CHO1
1University of Illinois at Chicago, Chicago, IL

Role of FAK in BMP4 Induction of Mesenchymal Stem Cell Adipogenesis
J. LEE1, L. HA1, and J. LIM1
1University of Nebraska-Lincoln, Lincoln, NE

Signaling Pathway Modulation for Directed Cardiogenic Differentiation of Human Pluripotent Stem Cells
A. PARIKH1 and E. S. TANAKAKIS1
1SUNY Buffalo, Buffalo, NY

Investigation of GSK-3 Inhibitor BIO in Endothelial Differentiation of Murine Embryonic Stem Cells
D. Y. KIM1 and G. DAI1
1Rensselaer Polytechnic Institute, Troy, NY
POSTER SESSION Thurs A 9:30AM – 1:00PM
POSTER VIEWING WITH AUTHORS & REFRESHMENT BREAK | 9:30AM - 10:30AM

P – Th - A - 273
Using a Design of Experiments Approach to Investigate Dopamine Neuron Subtypes Generated from Mouse Embryonic Stem Cells
Y-T. L. DINGLE1, R. SOOKRAM3, D. HOFFMAN-KIM1, and M. ZERVAS2
1Brown University, Providence, RI

P – Th - A - 274
Alginate Encapsulated Human Embryonic Stem Cell Derived Islet Cells For Type I Diabetes Treatment
T. C. RICHARDSON1, P. N. KUMTA1, and I. BANERJEE1
1University of Pittsburgh, Pittsburgh, PA

P – Th - A - 275
Enhancement of Guided Human Induced Pluripotent Stem Cell Differentiation to Mesendodermal and Ectodermal Lineages Using Polycaprolactone Nanofibrous Scaffolds
M. MALDONADO1, T. FUJIMOTO1, L. WONG1, K. LOW1, and J. NAM1
1University of California, Riverside, CA

P – Th - A - 276
Suspension Shear Stimulation Accelerates Differentiation of Human Mesenchymal Stem Cells Towards Adipogenic Lineage
A. ADENIRAN-CATLETT1 and S. MURTHY1
1Northeastern University, Boston, MA

P – Th - A - 277
Nanog Enhances the Proliferation and Reverses the Effect of Senescence on Myogenic Differentiation of Human Mesenchymal Stem Cells
P. MISTRIOTI1, M. LIANG2, and S. ANDREADIS1,2
1University at Buffalo, Amherst, NY; 2Center of Excellence in Bioinformatics and Life Sciences, Buffalo, NY

P – Th - A - 278
Cell Adhesion Density in Three Dimensional Hyaluronic Acid Based Hydrogels Control Human Adipose Derived Mesenchymal Stem Cell Differentiation Via Focal Adhesion Kinase
B. DUAN1, L. A. HOCKADAY1, E. KAPETANOVIĆ1, and J. T. BUTCHER1
1Cornell University, Ithaca, NY

P – Th - A - 279
MicroRNA Screen of Human Embryonic Stem Cell Differentiation Reveals miR-105 as an Enhancer of Megakaryocyte Production from Adult CD34+ Cells
V. KAMAT1 and S. L. DIAMOND1
1University of Pennsylvania, Philadelphia, PA

P – Th - A - 280
HMSC Commitment: A Matter of Stiffness
A. MEMBRINO1, C. DOHERTY1, D. KILINC1, D. VANDAMME1, K. IVANOVI1, G. U. LEE1, W. KOLCH1, and D. MATHALANAS1
1University College Dublin, Dublin, Ireland

P – Th - A - 281
Chondrogenic Differentiation of Adipose Derived Stem Cells on Polymeric Nanowire Surfaces
N. A. TRUJILLO1 and K. C. POPAT1
1Colorado State University, Fort Collins, CO

P – Th - A - 282
Heterogeneous Traction Force Distributions in MSC Clonal Populations
B. D. COSGROVE1, C. M. MCLLEOD1, M. J. FARRELL1, M. GUVESENDIEN1, J. A. BURDICK1, and R. L. MAUCK1
1University of Pennsylvania, Philadelphia, PA

P – Th - A - 283
Hematopoietic Stem and Progenitor Cells Locally Produce Neutrophils Necessary to Resolve Infected Wounds
P. FALAHIEH1
1UC Davis, Davis, CA
Thursday, September 26, 2013
1:30PM – 5:00PM POSTER SESSION Thrus B

Track: Biomaterials

Biomaterials for Controlling Cell Environment

P – Th - B - 1
ROCK Regulation in Cell Alignment on Nanofibers
M. N. ANDALIB1, J. LEE1, L. HA1, Y. DZENIS1, and J. LIM1
1University of Nebraska-Lincoln, Lincoln, NE

P – Th - B - 2
Spatial and Temporal Modulation of 3D Hydrogel Physical Properties
R. STOWERS1, C. L. DAVIS1, and L. J. SUGGS1
1The University of Texas at Austin, Austin, TX

P – Th - B - 3
Absorption, Degradation, and Cell Adhesion on Polyelectrolyte-Complex Films
S. A. MISTRY1, S. PURI1, D. VERMA1, R. SCHLOSS1, and N. A. LANGRANA1
1Rutgers University, Piscataway, NJ

P – Th - B - 4
Immobilization of EphrinB2 in an Orientation-regulated Manner on the Surface of Poly(acrylamide) Hydrogels with Different Elasticities
H. TODA1, M. YAMAMOTO1, and Y. TABATA1
1Institute for Frontier Medical Sciences, Kyoto University, Kyoto, Japan

P – Th - B - 5
Engineering a Heart-On-Chip Platform
N. ANNABI1, S. SELIMOVIC1, J. COX1, J. RIBAS1, M. AFSHAR BAKOOGHI1, D. HEINZE1, A. S. WEISS1, D. CROPEK2, and A. KHADEMHOSEINI1,2
1Harvard Medical School, Cambridge, MA; 2Wys Institute for Biologically Inspired Engineering, Cambridge, Massachusetts Institute of Technology, Cambridge, MA; 3The University of Sydney, Sydney, Australia, and 4US Army Corps of Engineers Construction Engineering Research Laboratory, Champaign, IL

P – Th - B - 6
Enzymatically Cross-linked Injectable Chitosan Hydrogel as Cell Delivery Vehicles
S. B. BRITAIN1 and L. S. NAIM2
1University of Connecticut, Storrs, CT; 2University of Connecticut, Farmington, CT

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A. THOMAS1, S. SEIDLITS1, A. GOODMAN1, T. KUKUSHLIEV1, D. HASSAN1, A. ANDERSON1, B. CUMMINGS2, and L. SHEA1
1Northwestern University, Evanston, IL; 2University of California at Irvine, Irvine, CA

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Endothelial Cell Function on Polyurethane Matrix for Tissue Vascularization
Y. YUAN1, C. CHEAH1, and D. SARKAR1
1University at Buffalo, SUNY, Buffalo, NY

P – Th - B - 9
A Haptotaxis Neutral Biomaterial to Examine Motility of CNS-Derived Tumor Cells
T. SINGH1, C. KOATHAPALLI1, D. VARMA1, M. VAZQUEZ1, and S. B. NICOLL1
1CCNY-CUNY, New York, NY; 2Cleveland State University, Cleveland, OH

P – Th - B - 10
Macrophage Polarizing Peptides Grafted onto Hydrogel Substrates for Contact Lens Applications
A. CHEN1, V. AGRAWAL1, B. RATNER1, and S. BADDYLA2
1University of Washington, Seattle, WA; 2McGowan Institute for Regenerative Medicine, Pittsburgh, PA

P – Th - B - 11
Ionically- and Photo-crosslinked Alginate Hydrogels for Spatial Control of Cell Behavior
J. E. SAMOREZOV1, C. M. MORLOCK1, and E. ALSBERG1
1Case Western Reserve University, Cleveland, OH

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Titanium Oxide Cristallinity Nanomodification Affects Stem Cell Attachment and Differentiation on Microstructured Surfaces
R. OLIVARES-NAVARRETE1, S. L. HYZY1, C. A. CUNDIFF2, S. E. RODIL3, A. ALMAGUER-FLORES1, B. D. BOYAN1, and Z. SCHWARTZ1
1Virginia Commonwealth University, Richmond, VA; 2Georgia Institute of Technology, Atlanta, GA; 3UNAM, Mexico City, Mexico

P – Th - B - 13
Superhydrophobic Microstructured Surfaces Decrease Proinflammatory Interleukin Production on Stem Cells
S. L. HYZY1, R. OLIVARES-NAVARRETE1, K. O. MARCHAND2, D. A. HATHCOCK2, Z. SCHWARTZ1, and B. D. BOYAN1
1Virginia Commonwealth University, Richmond, VA; 2Georgia Institute of Technology, Atlanta, GA

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Utilizing Microfiber-Enabled Lithography to Engineer Spatially Diverse Tissue Microenvironments
M. R. ANDERSON1 AND W. C. RUDER1
1Virginia Tech, Blacksburg, VA

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Single Cell Response to Changes in Nanofiber Structural Stiffness
S. MEEHAN1 and A. S. NAIN1
1Virginia Tech, Blacksburg, VA

Track: Biomaterials

Biomaterials for Immunomodulation

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High Fc Density Particles Result in Binary Complement Activation but Tunable Macrophage Phagocytosis
P. M. PACHECO1, B. LE1, D. WHITE1, and T. SULCHER1
1Georgia Institute of Technology, Atlanta, GA; 2United States Department of Agriculture, Ames, IA

P – Th - B - 17
Immunomodulation of the Foreign Body Reaction by MSCs Declines with Differentiation
M. D. SMARTZLANDER1, A. K. BLANKEY1, K. D. HANKENSON1, T. R. KYRIAKIDES2, and S. J. BRYANT1
1University of Colorado, Boulder, CO; 2University of Pennsylvania, Philadelphia, PA; 3Yale University, New Haven, CT

P – Th - B - 18
Peptide Self-assemblies Composed of D-amino Acids Elicit Inverse B and T Cell Responses Compared to their Enantiomeric Counterparts
C. B. CHESSON1, R. APPU1, and J. S. RUDRA1
1University of Texas Medical Branch, Department of Pharmacology and Toxicology, Galveston, TX

P – Th - B - 19
Antigen-Decorated Liposomes as Reagents for Detecting and Isolating Antigen-Specific B Cells
C. KI1 and D. J. IRVINE1,2
1Massachusetts Institute of Technology, Cambridge, MA; 2Howard Hughes Medical Institute, Chevy Chase, MD

P – Th - B - 20
Functional Characterization of Chitosan and its Influence on Immune Response
S. RAVIRANATHAN1 and D. ZAHAROFF1
1University of Arkansas, Fayetteville, AR
**Thurs B 1:30PM – 5:00PM**

**Poster Session**

**Track: Biomaterials**

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<td>B. Mississippi State University, Mississippi State, MS, Dalian Medical University, Liaoning, China, People's Republic of</td>
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<td>Z. Drexel University, Philadelphia, PA</td>
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<td>Massachusetts Institute of Technology, Cambridge, MA, Koch Institute for Integrative Cancer Research, Cambridge, MA, Instituto LLC, Cambridge, MA, Brigham and Women’s Hospital, Boston, MA</td>
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<td>Colorado State University, Fort Collins, CO</td>
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**Poster Viewing with Authors & Refreshment Break | 3:00PM - 4:00PM**
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M. A. BRUNETTE1, H. R. HOLMES1, M. G. LANCIANA1, W. HE1, B. P. LEE2, M. C. FROST3, and R. M. RAJACHAR1
1Michigan Technological University, Houghton, MI

Track: Cancer Technologies
Biomarkers

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Dynamic Biochemical Tissue Analysis: A Novel Method for In Situ Antigen Detection
V. S. SHRURE1, G. E. CARLSON1, E. W. MARTIN1, R. MALGOR1, V. A. RESTO1, D. J. GOETZ2, and M. M. BURDICK
1Ohio University, Athens, OH, 2University of Texas-Medical Branch, Galveston, TX

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C. C. HUANG1, S. M. SANTANA1, M. A. ANTONYK1, C. FISCHBACH-TESCHL2, R. A. CERIONE1, and B. J. KIRBY
1Cornell University, Ithaca, NY

Mechanical Properties of Cancer Cells: A Possible Biomarker for Stemness
A. MOHAMMADALIPOUR1, F. BENENCIA1, M. BURDICK1, and D. TEES1
1Ohio University, Athens, OH

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Dynamic Biochemical Tissue Analysis detects functional L-selectin Ligands on Colon Cancer Tissues
G. E. CARLSON1, V. S. SHRURE1, V. A. RESTO2, R. MALGOR3, D. J. GOETZ4, and M. M. BURDICK
1Ohio University, Athens, OH, 2University of Texas-Medical Branch, Galveston, TX

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M. KARABACAK1, N. KOJIC1, V. PAU1, E. OZKUMUR1, A. M. SHAH1, J. CICILIANO1, E. BRACHTEL2, S. STOTT1, S. MAHESWARAN1, D. A. HABER1, and M. TUNEN1
1Massachusetts General Hospital, Charlestown, MA

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Time of Flight Secondary Ion Mass Spectrometry Analysis of Breast Cancer Cell Lines
L. GAMBLE1, M. ROBINSON1, F. MORRISH1, and D. HOCKENBERRY2
1University of Washington, Seattle, WA, 2Fred Hutchinson Cancer Research Center, Seattle, WA

P – Th - B - 50
Conjugation of Biomolecules (Folic Acid, RGD Peptide, and PSMA Inhibitor) to Luminescent NPs for Breast and Prostate Cancer Targeting
L. ROSSEIN RASHIDI1, H. HOMAYONI1, L. MA1, X. ZOU2, and W. CHEN2
1Joint Biomedical Engineering Program, UT Arlington, UT Southwestern Medical Center, Arlington, Dallas, TX, 2UT Arlington, Physics, Arlington, TX

P – Th - B - 51
Machine Learning Outperforms Manual Counting for Classifying Circulating Tumor Cells from Cancer Patients
T. B. LANNIN1, M. S. SUNG1, F. I. THEGE1, Y. A. SYED1, G. I. GALETTI1, A. D. RHIM1, P. A. GIANNAKAKOU2, and B. J. KIRBY1
1Sibley School of Mechanical and Aerospace Engineering, Cornell University, Ithaca, NY, 2Weill Cornell Medical College, New York, NY

Track: Cancer Technologies
Biomedical Engineering Modalities

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J. I. RODRIGUEZ-DEVORA1, D. REYNA1, M. K. BHUYN1, and T. BOLAND1
1University of Texas at El Paso, El Paso, TX

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Biophysical Effects of Pulsed Electric Fields in the Brain
P. A. GARCIA1, C. B. ARENA1, J. H. ROSSMEISL1, JR.1, and R. V. DAVALOS1
1Virginia Tech - Wake Forest University, Blacksburg, VA

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M. AL AMEEN1 and G. GHOSH1
1University of Michigan, Dearborn, Dearborn, MI

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N. H. HOANG1, S. H. RATNAYAKA1, C. CHEN1, and D. B. KHISMATULLIN1
1Tulane University, New Orleans, LA

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J. MARSHALL1, A. HUGHES2, E. KELLER2,3, J. POWDERLY2,3, B. GREENE2,3, and M. KIN7
1Cornell University, Ithaca, NY, 2BioDecisys, Inc., Huntersville, NC, 3Carolina BioOncology Institute, Huntersville, NC

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Advancing Quantum Dot Nanosensors and Calibration Beads for Quantitative Cellular Profiling
F. T. LEE-MONTIEL1 and P. IMOUKHEIDE1
1University of Illinois Urbana-Champaign, Urbana, IL

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A Microfluidic Device to Dissociate Tumor Tissue into Single Cells
J. DE JESUS1, E. HUI1, and J. HAUN1
1University of California, Irvine, Irvine, CA

Track: Cancer Technologies
Engineering Anti-tumor Immunity

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A Targeted Endosomolytic Nanoparticle for Engineering Tumor Immunity in Macrophages
R. A. ORTEGA1,2, W. BARHAM2, O. TIKHOMIROV2, B. KUMAR1, F. YULL1, and T. D. GIORGIO1,2
1Vanderbilt University Department of Biomedical Engineering, Nashville, TN, 2Vanderbilt University Department of Cancer Biology, Nashville, TN
Track: Cancer Technologies

Nanotechnologies for Cancer Detection and Treatment

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Silver Nanoparticles for Photothermal Ablation of Breast Cancer
N. H. LEVI-POLYACKHENO1, E. A. THOMPSON1, C. MACNEILL1, G. DONATI2, E. WAILES1, AND B. T. JONES1
1Wake Forest University Health Sciences, Winston-Salem, NC, 2Wake Forest University, Winston-Salem, NC

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Y. WANG1, S. YI1, L. SUN1, Y. HUANG1, AND M. ZHANG1
1The University of Tennessee, Knoxville, TN

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E. G. GRAHAM1, AND N. H. LEVI-POLYACKHENO1
1Wake Forest Baptist Medical Center, Winston-Salem, NC, 2Virginia Tech-Wake Forest, Winston-Salem, NC

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C. M. MACNEILL1, R. C. COFFIN1, D. L. CARROLL2, AND N. H. LEVI-POLYACKHENO1
1Wake Forest University Health Sciences, Winston Salem, NC, 2Center for Nanotechnology and Molecular Materials, Wake Forest University, Winston Salem, NC

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K. M. MAYLE1, R. Y. CHIU1, R. J. LAMM1, S. KNOWLES1, A. M. WU1, AND D. T. KAMEI1
1University of California, Los Angeles, Los Angeles, CA

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W. LI1, E. REATEGUI1, M.H. PARK1, S. CASTLEBERRY1, S. MAYNER1, A. JENSEN2, S. L. STOTT1, AND S. U. HARRISON1
1MIT, Cambridge, MA, 2Massachusetts General Hospital and Harvard Medical School, Boston, MA

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M. R. DEWIT1, A. PEKKANEN1, J. ROBERTSON1, AND M. N. RYLANDER1
1Virginia Tech-Wake Forest University, Blacksburg, VA, 2Virginia Tech, Blacksburg, VA

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V. PAN1, C. L. MODER-PALOWSKI1, A. MASTER1, P. SIVA1, G. HOWARD1, AND A. SEN GUPTA1
1Case Western Reserve University, Cleveland, OH, 2University of Akron, Akron, OH

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A Novel Method of Early detection for Oral Cancer
M. DHAR1, Y-A. CHEN1, J. YU1, W. J. MELVIN1, A. DAKOS1, J. ZHENG1, AND T. WU1
1Johns Hopkins University, Baltimore, MD

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S. X. XIE1, F. GAO1, J. H. BOOSKE2, S. C. HAGNESS3, AND B. SITTHARAMAN1
1Stony Brook University, Stony Brook, NY, 2University of Wisconsin-Madison, Madison, WI
Thermal Responsive Nanoparticle-Encapsulated Curcumin and Its Combination with Mild Hyperthermia for Cancer Cell Destruction

W. RAO1, I. P. FUENTES2, and X. HE1
1The Ohio State University, Columbus, OH, 2University of Puerto Rico, Mayaguez, PR

Gold Nanoparticles Enable Targeted Labeling and Enhanced Contrast for Radiographic Imaging of Breast Microcalcifications

L. E. COLE1, T. C. VARGO-GOGOLA2, and R. K. ROEDER1
1University of Notre Dame, Notre Dame, IN, 2Indiana University School of Medicine - South Bend, South Bend, IN

Elastin Based Multifunctional Nanoparticles for Targeted Therapy of Lung Adenocarcinomas

R. IGLESIAS1 and P. KORA1
1University of South Florida, Tampa, FL

Lysosome Disruption by Targeted Magnetic Nanoparticles

M. DOMENECH1, I. MARREDO-BERRIOS1, M. TORRES-LUGO1, and C. RINALDI1
1University of Puerto Rico, Mayaguez, Mayaguez, PR, 2University of Florida, Gainesville, FL

Nanopore Single-molecule Detection of Cancer-derived microRNA Biomarkers

Y. WANG1 and L-Q. GU1
1University of Missouri, Columbia, MO

NanoDoctor: Crowdsourcing the Design of Swarming Nanoparticles

S. HAUERT1, J. LO1, O. NACHUM1, and S. N. BHATIA1
1Massachusetts Institute of Technology, Cambridge, MA

Multifunctional Prussian Blue Nanoparticles for Theranostics of Pediatric Brainstem Gliomas

M. F. DUMONT1, S. YADAVILLI1, R. W. SZE2, J. NAZARIAN1, and R. FERNANDES2
1Children’s National Medical Center, Washington, DC, 2George Washington University, Washington, DC

Temperature Responsive Coating for Enrichment and Isolation of Circulating Tumor Cells from Whole Blood

E. REATEGUI1, A. JENSEN1, J. SULLIVAN1, N. ACETO1, S. MAHESWARAN1, D. HABER1, M. TONEY1, and S. STOTT1
1Center for Engineering in Medicine, Massachusetts General Hospital, Harvard Medical School, Charlestown, MA, 2Department of Surgery, Massachusetts General Hospital, Harvard Medical School, Charlestown, MA, 3Massachusetts General Hospital Cancer Center, Harvard Medical School, Charlestown, MA, 4Howard Hughes Medical Institute, Chevy Chase, MD

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J. A. KOPECHEK1, E-J. PARK2, C-S. MEI2, Y-Z. ZHANG3, N. J. MCDANOLD2, and T. M. PORTER1
1Boston University, Boston, MA, 2Brigham and Women’s Hospital, Harvard Medical School, Boston, MA

Track: Cardiovascular Engineering

Cardiac Mechanics

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P. G. MENON1 and S. M. ADHYAPAK2
1Carnegie Mellon University, Pittsburgh, PA, 2St. John’s Medical College Hospital, Bangalore, India

Decellularized Myocardial Thin Sections as Scaffolds for Engineered Heart Tissue

A. H. MORRIS1, J. SCHWAN1, A. KWACZALA1, M. B. AYERS1, and S. G. CAMPBELL1
1Yale University, New Haven, CT

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S. G. NOWAKOWSKI1, M. REGNER1, and V. DAGGETT1
1University of Washington, Seattle, WA

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O. FÖRÖUZAN1, A. BELLÉFORE1, M. BATES1, H. KELLHAN1, D. CONSIGNY1, C. FRANÇOIS1, and N. CHESLER1
1University of Wisconsin-Madison, Madison, WI

Heart Valves

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S. ALAVI1 and A. KHERADVAR1
1University of California Irvine, Irvine, CA

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A. FALAHATPSHIEH1, N. PAHLIEVAN2, B. DUEIT1, and A. KHERADVAR2
1University of California, Irvine, Irvine, CA, 2Edwards Lifesciences Center for Advanced Cardiovascular Technology, Irvine, CA, 3California Institute of Technology, Pasadena, CA

Association between the Axial Position of the Transcatheter Aortic Valve and the Hemodynamics of Valsalva Sinus

A. FALAHATPSHIEH1, E. GROVES1, J. SU1, and A. KHERADVAR2
1University of California, Irvine, Irvine, CA, 2Edwards Lifesciences Center for Advanced Cardiovascular Technology, Irvine, CA

Development of a Laboratory Protocol for the Fabrication and Assessment of a Realistic Calcified Aortic Valve Model

C. SEAMAN1, S. BIDDE1, and P. SUCOSKY1
1University of Notre Dame, Notre Dame, IN
Track: Cardiovascular Engineering

Hemodynamics

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R. MADAPPALLIY, R. M. ALEX, and K. BEHRKHANI
1University of Texas Arlington, Arlington, TX, UT Arlington, Arlington, TX

P – Th - B - 111
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Y. XIAO, J. K. CHESNUTT, and H.C. HAN
1University of Texas at San Antonio, San Antonio, TX

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Q. ZHANG, M. B. STEINBERG, T. P. MAIZ, C. P. KNAPP, A. R. PATWARDHAN, and J. M. EVANS
1University of Kentucky, Lexington, KY, Wyle Science, Technology and Engineering Group, Houston, TX, Wyle Technologies, Houston, TX

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M. SULTANA, D. A. RUBENSTEIN, and W. YIN
1Oklahoma State University, StillWater, OK

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J. LEE, M. ESMAILY-MOHADAM, E. KUNG, A. L. MARSDEN, and T. K. HSIAI
1University of Southern California, Los Angeles, CA, University of California, San Diego, La Jolla, CA

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Y. KANG, D. SHIN, J. ESCUDERO, E. IFEACHOR, and V. MARMARELIS
1University of Southern California, Los Angeles, CA, Plymouth University, Plymouth, United Kingdom

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J. SEONG, W. JEOSIN, N. SMITH, and R. TOWNER
1California State Polytechnic University, Pomona, CA, University of Central Oklahoma, Edmond, OK, Oklahoma Medical Research Foundation, Oklahoma City, OK

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V. MARMARELIS, D. C. SHIN, M. E. ORME, and R. ZHANG
1University of Southern California, Los Angeles, CA, Sonovation Inc., Palos Verdes Estates, CA, University of Texas Southwestern Medical Center, Dallas, TX

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V. MARMARELIS, D. SHIN, M. ORME, and R. ZHANG
1University of Southern California, Los Angeles, CA, Sonovation Inc., Palos Verdes Estates, CA, University of Texas, Southwestern Medical Center, Dallas, TX

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Effect of Calcium Chloride in Platelet-Rich Plasma on Platelet Aggregation via Biointerfaces
A. RHYNER, J. MALINARIC, L. GALEY, P. LAMMERT, A. GENET, Z. STEEGE, J. M. LOPEZ, and M. G. WATSON
1LeTourneau University, Longview, TX, UP Aeropool, Puebla, Mexico
**Track: Cardiovascular Engineering**

**Lymphatic System**

**P – Th - B - 122**
Effects of Interstitial and Luminal Flow on Dendritic Cell Transmigration into Initial Lymphatic Vessels
M. PISANO* and M. SWARTZ2
1École Polytechnique Fédérale de Lausanne (EPFL), Lausanne, Switzerland

**P – Th - B - 123**
Multiple Modes of Lymphatic Vessel Pumping Predicted by One Simple Mechanism
C. KUNERT1, S. LIAO1, D. JONES1, J. W. SONG1, T. P. PADERA1, and L. L. MUNN1
1Mass General Hospital/Harvard Medical School, Boston, MA

**Track: Cardiovascular Engineering**

**Cardiovascular Engineering**

**P – Th - B - 124**
Spatial Variation of Protein and Elastic Lamellae along Aortic Media
R. CHEHITIANI1, A. HEMMASSIZADEH2, S. ASSARI1, N. PLESHKO1, M. F. KIANI1, and K. DARVISH1
1Temple University, Philadelphia, PA

**P – Th - B - 125**
A Novel Implantable Glaucoma Valve Using Ferrofluid
G. RAVI1, P. G. MCCORKLE1, Y.S. SEO1, S. RAO1, and J.C. CHIAD1,2
1UT Arlington, Arlington, TX, 2UTSW Medical Center of Dallas, Dallas, TX

**Track: Device Technologies and Biomedical Robotics**

**Implantable Devices**

**P – Th - B - 129**
TNF-α Stimulated Endothelial Cells Become Elongated When Exposed to Statin Drugs and Laminar Wall Shear Stress
M. DICK1 and R. L. LEASK1
1McGill University, Montreal, QC, Canada

**P – Th - B - 130**
Antiviral Drugs and Their Effects On Arterial Remodeling and Protease Activity
L. M. ROBERTS1, I. PARKER1, and M. PLATT2
1Georgia Institute of Technology, Atlanta, GA, 2Georgia Institute of Technology/Emory University, Atlanta, GA

**P – Th - B - 131**
Effect of Intraluminal Thrombus in Abdominal Aortic Aneurysm Expansion: A Longitudinal Patient Study
B. A. ZAMBRANO1, J. CHOI1, and S. BAEK1
1Michigan state University, East Lansing, MI

**Track: Device Technologies and Biomedical Robotics**

**Stents**

**P – Th - B - 132**
Vascular Stents With Rationally-Designed Surface Nanopatterning
S. C. GOTT1, B. A. JABOLA1, G. XU1, and M. P. RAO2
1University of California-Riverside, Riverside, CA, 2Saratech Inc., Lake Forest, CA
Track: Device Technologies and Biomedical Robotics

Implantable Electronics

P – Th - B - 138
Package Design and Life Testing of a Percutaneously Implanted Cardiac Pacemaker for Fetuses
L. ZHOU1, R. CHHATE1, B-C. YAN1, R. A. PECK1, M. LU1, AND G. E. LOEB1
1University of Southern California, Los Angeles, CA, 2Children’s Hospital Los Angeles, Los Angeles, CA

P – Th - B - 139
Performance of Temporal and Spectral Speech Coding in Noisy Background for Cochlear Implant
M. G. BINGABER1, B. ESPINOZA-VARAS2, S. BINGABER3, AND A. MOUSSA4
1University of Central Oklahoma, Edmond, OK, 2Oklahoma University Health Science Center, Oklahoma City, OK, 3Oklahoma University, Norman, OK

P – Th - B - 140
Three-dimensional Slot Filter for Viable Capture of Circulating Tumor Cells
M. ZHOU1, J. WANG1, J. CHANG1, W. KHAN1, AND S. ZHENG1
1Pennsylvania State University, University Park, PA, 2Harvard University, Cambridge, MA

P – Th - B - 141
Drug-Loaded PLGA Microsphere/PVA Hydrogel Composite to Improve Performance of Implantable Biosensors
S. YADDIRAJU1, Y. WANG1, D. J. BURGESS1, AND F. PAPADIMITRIOUKOPOULOS2
1Bionics Inc., Storrs, CT, 2University of Connecticut, Storrs, CT

P – Th - B - 142
Electric Field-Assisted Delivery is an Effective Modality to Locally Deliver Cytotoxic Therapy to Pancreatic Cancer
J. BYRNE1, M. JAJAR1, A. O’NEILL1, M. NAPIER1, J. C. LUFT1, J. YEH1, AND J. DESIMONE1,2
1University of North Carolina at Chapel Hill, Chapel Hill, NC, 2North Carolina State University, Raleigh, NC

Track: Device Technologies and Biomedical Robotics

Physically Assistive Devices

P – Th - B - 148
Control of Assistive Forces Using Poststroke Residual Arm Movement
N. S. MAKOWSKI1, J. S. KNUTSON1,2, J. CHAE1,2, AND P. E. CRAGO1
1Case Western Reserve University, Cleveland, OH, 2MetroHealth Medical Center, Cleveland, OH

P – Th - B - 149
Effects of Using Wrist-hand Orthosis together with Functional Electrical Stimulation on Hand Opening in Chronic Stroke
J. YAO1, N. VAN KLIN2, J. SULLIVAN1, AND J. DEWALD1
1Northwestern University, Chicago, IL, 2University of Twente, Enschede, Netherlands

Track: Device Technologies and Biomedical Robotics

Nanobiointerfaces

P – Th - B - 150
Nanotopography Regulated Cell Sensing Nanomaterials
X. YU1, A. BRUCE1, L. WANG1, P. P. FULLAY1, Y. ROJANASAKUL1, AND Y. YANG2
1West Virginia University, Morgantown, WV, 2National Institute for Occupational Safety and Health, Morgantown, WV

P – Th - B - 151
Evaluation of Nanocrystalline Diamond Seeding Process to Develop a Bacterial Biosensor
W. ZHANG1, A. RADADJA1, S. BANU1, AND A. SCHENKNER2
1Louisiana Tech University, Ruston, LA, 2University of Louisiana at Lafayette, Lafayette, LA

Track: Device Technologies and Biomedical Robotics

Device Technologies and Biomedical Robotics

P – Th - B - 152
Biomechanical Benefits of Energy Harvesting During Walking Using Dielectric Elastomers
H. LAI1 AND C. TAN1
1Wayne State University, Detroit, MI

P – Th - B - 153
Importance of Discharge Energy and Uniformity of Nanosecond and Microsecond Pulsed Dielectric Barrier Discharges on Intracellular Generation of Reactive Oxygen Species in Mesenchymal Stem Cells
A. LIN1
1Drexel Plasma Institute, Camden, NJ

P – Th - B - 154
A Novel Approach in Detecting Normal and Shear Forces at the Fingertips with Minimal Hysteresis
X. ZHENG1 AND P. TROYK1,2
1Illinois Institute of Technology, Chicago, IL, 2Pritzker Institute of Biomedical Science and Engineering, Chicago, IL

P – Th - B - 155
Development and Application of Biomimetics in Prosthetics
K. M. CONRAD1, C. NOE1, AND J. LA BELLE1
1Arizona State University, Tempe, AZ
P – Th - B - 156
Preliminary Study to Optimize the LED Operation of the Unconstrained Photoplethysmography System
S. HONG1, J. LEE1, H. BAEK2, and K. PARK1
1Seoul National University, Seoul, Korea, Republic of; 2Texas Instruments, Seoul, Korea, Republic of; 3Samsung, Seoul, Korea, Republic of; 4College of Medicine, Seoul National University, Seoul, Korea, Republic of

Track: Nano to Micro Technologies

Microfluidic Platforms

P – Th - B - 157
Simultaneous Perfusion Apparatus (SPA) for Oocyte Manipulation and Tracking
S. ANGIONE1, L. BRAYBOY2, N. OULHES3, G. WESSEL4, and A. TRIPATHI5
1School of Engineering, Center for Biomedical Engineering, Brown University, Providence, RI; 2Division of Reproductive Endocrinology and Infertility, Women and Infants Hospital, Providence, RI; 3Warren Alpert Medical School, Brown University, Providence, RI; 4Department of Molecular Biology, Cell Biology and Biochemistry, Brown University, Providence, RI

P – Th - B - 158
A Self-Contained, Programmable Multiwell Cell Stimulation Platform
A. K. AU1, S. GIBBS1, A. SCOTTI1, L. F. HOROWITZ2, E. VINKENBOSCH3, B. OTIS4, and A. FOLCH5
1University of Washington, Seattle, WA; 2École Polytechnique Fédérale de Lausanne, Lausanne, Switzerland

P – Th - B - 159
Simulation Tools for Design Optimization of Microchannels Using Antibody-Analyte Transport-Reaction
K. L. HAMILTON1, R. CORTEZ1, H. FUJIOKA1, and D. P. GAVRI1
1Tulane University, New Orleans, LA

P – Th - B - 160
Simultaneous O2 and CO2 Measurements Localized in an Open Top Microfluidic Cell Culture
Z. LI1, Z. ZHAO1, R. LIU2, and J. F.-J. LO1
1University of Michigan at Dearborn, Dearborn, MI

P – Th - B - 161
Preferential Cell Migration to Rat Organ Lysates for the Study of Chemotactic Factors in Cancer Metastases
S. RAO1, U. TATA1, P. GARIBERT1, C. HERNANDEZ2, A. SHARMA1, V. K. LIN3, and J.-C. CHIAO1
1UT Arlington, Arlington, TX; 2UCLA, Los Angeles, CA; 3Plano High East, Plano, TX

P – Th - B - 162
Sphingolipid Metabolites Affect Dielectrophoretic Signature of Syngeneic Murine Ovarian Cancer Cells
A. SALMANZADEH1, E. S. ELVIN1, M. BONAKDAR1, P. C. ROBERTS3, E. M. SCHMID2, and R. V. DAVALOS1
1Virginia Tech, Blacksburg, VA

P – Th - B - 163
High Efficiency Magnetic Sieving Device for Rare T Cell Population
J.-H. LEE1, R. KEERSLASE2, and L. C. KAM2
1Columbia University, New York, NY; 2City College of New York, New York, NY

P – Th - B - 164
Characterizing Bacterial Adhesion in Flow without Transport Artifacts
W. E. THOMAS1
1University of Washington, Seattle, WA

P – Th - B - 165
Effective Microfluidic Mixing by Paramagnetic Microbeads Rotation: MEMS and Numerical Analysis
S. KIM1, D. P. GIDDENS1, D. OWEN1, and P. J. HESKETH1
1Georgia Institute of Technology, Atlanta, GA

P – Th - B - 166
Hypoxia Tolerance of the Mammalian Nervous System Under Spatially Controlled Oxygen Conditions
G. MAULEON1, J. LARSON1, and D. T. EDDINGTON1
1University of Illinois at Chicago, Chicago, IL

P – Th - B - 167
Development of a SERS-based System for the Detection of Bisphenol A in Blood
H. MARKS1, M. PISKO1, G. W. JACKSON1, J. KAMEOKA1, and G. COTE1
1Texas A&M, College Station, TX; 2Base Pair Biotechnologies, Inc., Houston, TX

P – Th - B - 168
EGF as a Novel Therapeutic Target for Medulloblastoma Metastasis
J. RICO1 and M. VAZQUEZ2
1The City College of New York, New York, NY

P – Th - B - 169
Fast Microfluidic Mixing Via Acoustically Oscillated Sharp Edges
P.H. HUANG1, D. AHMED1, WANG1, and T. J. HUANG1
1The Pennsylvania State University, State College, PA

P – Th - B - 170
An On-chip, Multichannel Droplet Sorter Using Standing Surface Acoustic Waves (SSAW)
S. LI1, X. DING1, F. GUO1, Y. CHEN1, M. I. LAPSLEY1, S-C. LIN1, and T. HUANG1
1Pennsylvania State University, University Park, PA

P – Th - B - 171
Improving the Post-thaw Wash Process for Cryopreserved Red Blood Cells Using Microfluidics
R. E. LUSIANTI1 and A. Z. HIGGINS1
1Oregon State University, Corvallis, OR

P – Th - B - 172
Ciliated Micropillar Based Microfluidic Isolation of Cancer Derived Exosomes
Z. WANG1, H.-J. WU1, Y. HU1, B. GODIN1, J. X. ZHANG1, and X. LIU1
1University of Texas at Austin, Austin, TX; 2The Methodist Hospital Research Institute, Houston, TX

P – Th - B - 173
Deformability Dependent Separation of Cells in a Microfluidic Device
G. WANG1, W. MAO1, R. BYLER1, K. PATEL1, C. HENEGAR1, A. ALEXEEV1, and T. SULCZEK1
1Georgia Tech, Atlanta, GA

P – Th - B - 174
Post-Assembly PEGylation of a PDMS Microchannel for Enhancing Hemocompatibility
K. M. KOHACH1, J. R. CARADONI1, A. S. GUPTA1, and J. J. POKTAK1
1Advanced Platform Technology (APT) Center, Louis Stokes Cleveland VA Medical Center, Cleveland, OH; 2Case Western Reserve University, Cleveland, OH; 3VA Ann Arbor Healthcare System, Ann Arbor, MI

P – Th - B - 175
Delayed Drosophila Embryogenesis under Oxygen Deprivation in Microfluidic Device
Z. WANG1, S. OPPEGARD1, D. EDDINGTON1, and J. CHENG1
1University of Illinois at Chicago, Chicago, IL
P – Th - B - 176
Tension Induced Neurite Growth in Microfluidic Channels
T. D. NGUYEN1 and M. C. MCALPINE1
1Princeton University, Princeton, NJ

P – Th - B - 177
Microfluidic Synthesis of Composite Microgels Converting Light into Mechanical Force
C-H. CHEN1
1National University of Singapore, Singapore, Singapore

P – Th - B - 178
Preparation and Characterization of PEO Coating for Microchannel Hemodialyzer Application
M. COBYL1, K. HEINTZ1, K. SCHILKE1, J. SNIDER1, M. TRUONG1, G. JOVANOVIĆ1, J. MCGUIRE1, and W-K. LEE2
1Oregon State University, Corvallis, OR, 2Lehigh University, Bethlehem, PA

P – Th - B - 179
Enhanced Control of Cell Motion Using Cytotactic Surfaces and Electric Fields
C. EDINGTON1, Y. MURATA1, R. KOESEL2, J. ANDERSEN1, T. KANADE1, A. C. BALAZS1, Z. LIRON2, and A. J. RUSSELL2
1University of Pittsburgh, Pittsburgh, PA, 2Carnegie Mellon University, Pittsburgh, PA

P – Th - B - 180
A Chip for Hydrodynamic Microvortical Rotation of Live Single Cells
R. M. SHETTY1, J. MYERS2, T. TELLER1, A. SHABILLA1, H. WANG1, SH. CHAO1, D. SMITH1, J. HOUKAL1, J. VELA1, L. KELBAUSKAS1, R. H. JOHNSON2, and D. R. MELDRUM1
1Arizona State University, Tempe, AZ

P – Th - B - 181
The Integration Of Tailorable Membranes Within Microchannels To Electrophoretically Fractionate DNA
M. ZHEN1, B. KALARA1, and J. D. ZAHN1
1Rutgers, The State University of New Jersey, Piscataway, NJ

P – Th - B - 182
Simple Microfluidic Assay For The Measurement Of Neutrophil Oxidative Burst
S. MOUSAVI-HARAMI1, E. K. SACKMANN1, A. HUTTENLOCHER1, and D. J. BEEBE1
1University of Wisconsin, Madison, WI

P – Th - B - 183
Developing and Characterizing Microfluidic Devices to Study the Role of Mechanobiology on Endothelial-to-Mesenchymal Transformation
S. MINAI1, W. WANG1, Q. CAO1, B. MURRAY1, P. HUANG1, and G. MAHLER1
1Binghamton University, Binghamton, NY

P – Th - B - 185
Guided Cell Migration by Topographical Guidance and Biomolecular Gradients Within an Open Access Microfluidic Chamber array
P. KIM1, K. NAM1, N. BHATTACHARJEE1, A. FOLCH1, S. KWON1, and D-H. KIM1
1University of Washington, Seattle, WA, 2Seoul National University, Seoul, Korea, Republic of

P – Th - B - 185
Development of Sealing Methods for a Microchannel Hemodialyser
P. S. MCNEFF1, S. PORTER1, D. WARD1, and B. PAUL2
1Oregon State University, Corvallis, OR

P – Th - B - 156
A Micropore-based Impedance Flow Cytometer for Identifying Differentiation State of Stem Cells
H. SONG1, Y. WANG1, J. ROSANO1, B. PRABHAKARPANDIAN1, C. GARSON1, K. PANT1, and E. LAF1,2
1CFD Research Corporation, Huntsville, AL, 1U.S. Army Medical Research and Materiel, Fort Detrick, MD, 2Johns Hopkins University, Baltimore, MD

P – Th - B - 186
A Micropatterned Microfluidic Platform for Probing Physicochemical Effects on Cell Behavior
R. NATIVIDAD1 and A. ASTHAGIRI1
1Northeastern University, Boston, MA

P – Th - B - 187
Cell Communication in Three Dimensional Microenvironments
M. BYRNE1, L. TRUMP1, A. DESAI1, L. A. RUND1, L. A. SCHOOK1, and P. J. KENIS1
1University of Illinois at Urbana-Champaign, Urbana, IL

P – Th - B - 188
Reconfigurable Microfluidics Combined with Antibody Microarrays for Enhanced Detection of T-cell Secreted Cytokines
T. M. VU1, A. CHEN1, T. PAN1, and A. REVZIN1
1UC Davis, Davis, CA

P – Th - B - 189
Standing Surface Acoustic Wave (SSAW) Based Rare Cell Enrichment
Y. CHEN1 and T. J. HUANG1
1The Pennsylvania State University, University Park, PA

P – Th - B - 190
High-throughput Cell Screening in an Open Microfluidic Platform
L. F. HOROWITZ1, A. K. AU2, A. SCOTT1, D. R. STORM2, and A. FOLCH1
1University of Washington, Seattle, WA

P – Th - B - 191
Design and Fabrication of Engineered Platforms to Control Multiple-cue Directional Migration
L. M. LAIA1, C. SCHNEIDER1, and S. WILLETT1
1Iowa State University, Ames, IA, 2Arkansas Tech University, Russellville, AR

P – Th - B - 192
Point-of-Care CD Immunostaining Assay for Characterization of Age-Related Macular Degeneration
D. I. WALSH1 and S. K. MURPHY1
1Northeastern University, Boston, MA

P – Th - B - 193
Magnetically Coated Track-Etched Membranes for Highly Efficient Sorting of Biological Targets
M. MULLEN2 and D. ISSADORE1
1University of Pennsylvania, Philadelphia, PA

P – Th - B - 194
Electroosmotic-on-Disc: A High Throughput Screening Platform for Electrotaxis-Related Genes
S. ZHAO1, R. GAO2, M. ZHAO2, T. PAN1, and P. DEVREOTES2
1University of California, Davis, Davis, CA, 2University of California, Davis, Sacramento, CA, 3Johns Hopkins University School of Medicine, Baltimore, MD

P – Th - B - 195
Self-Sorting Bacteria from Heterogeneous Samples Using Microfluidic Devices
N. TANDOGAN1 and E. D. GOLUCH1
1Northeastern University, Boston, MA

P – Th - B - 196
Integrated In-Film Bioprocessing in Microfluidics Enabled Membranes and Cell-Gel Composites
X. LUO1, J. TERREL2, H-C. WU2, C-Y. TSAO1, and W. BENTLEY2
1Catholic University of America, Washington, DC, 2University of Maryland, College Park, MD

P – Th - B - 197
Leukocyte Isolation and Sorting Using Microdiaphragm Pumping and Registered Microfiltration
T. GABORSKI1 and J. WILCOX1
1Rochester Institute of Technology, Rochester, NY
P – Th - B - 217
Multi-Level Disease Models from Gene Expression Data
J. E. SHOEMAKER1, S. FUKUYAMA2, H. KITANO1, 2, and Y. KAWAIKA1, 2
1Japan Science and Technology Agency, Minato-ku, Japan, 2The Systems Biology Institute, Tokyo, Tokyo, Japan, 3The University of Wisconsin, Madison, Madison, WI

P – Th - B - 218
MicroRNA miR-15b Modulates In Vivo Cyclic Stretch-induced Increases in Permeability and Regulates Neuregulin 1 (Nrg1)
N. YEHYA1, 2, M. J. SON1, G. G. LAWRENCE1, N. DAVIDOVICH1, and S. S. MARGULIES3
1University of Pennsylvania, Philadelphia, PA, 2Children’s Hospital of Philadelphia, Philadelphia, PA

Track: Respiratory Bioengineering

Modeling of Lung Physiology

P – Th - B - 219
A Computational Model of Inter-airway Interactions Mediated by the Parenchyma
B. MA1 and J. H. BATES1
1University of Vermont, Burlington, VT

P – Th - B - 220
Interaction Between Cortical Actin and Extracellular Matrix Contributes to Airway Smooth Muscle Reactivity
H. PARAMESWARAN1, E. CANOVIC1, B. HARVEY1, M. SMITH1, D. STAMENOVIC1, B. SUKI1, and K. R. LUTCHEN1
1Boston University, Boston, MA

P – Th - B - 221
Modeling the Pulmonary Distribution of Surfactant Administered into an Asymmetric Airway Tree
M. FILOCHE1, C-F. TAF1, M. FLORENS1, and J. B. GROTBERG2
1Ecole Polytechnique, CNRS, Palaiseau, France, 2University of Michigan, Ann Arbor, MI

P – Th - B - 222
Modeling and Experimental Validation of Sound Transmission in Human Torso
Y. PENG1, Z. DAI2, H. MANSY2, B. HENRY2, R. SANDLER2, and T. ROYSTON2
1University of Illinois at Chicago, Chicago, IL, 2University of Illinois at Chicago, Chicago, IL

P – Th - B - 223
A Five Layer Finite Element Model for Simulation of Passive and Active Airway Wall Mechanics
B. J. BREEN1 and M. H. TAWHAI1
1Auckland Bioengineering Institute, Auckland, New Zealand

P – Th - B - 224
Numerical Model of Oxygen Trapping in the Healthy and Diseased Lung
M-Y. KANG1, M. FILOCHE1, 2, I. KATZ1, 2, and B. SADOVSKY1, 2
1CNRS - Ecole Polytechnique, Palaiseau Cedex, France, 2UniverSud, Cachan, France, 3Air Liquide Santé International, Jouy-en-Josas, France, 4Lafayette College, Easton, PA

P – Th - B - 225
What Triggers the Emergence of Ventilation Defects in Asthma?
T. WINKLER1, A. GROS2, Y. BAR-YAM2, J. G. VENEGAS3, and M. A. DE AGUIAR4
1Harvard Medical School & Massachusetts General Hospital, Boston, MA, 2New England Complex Systems Institute, Boston, MA, 3Universidade Estadual de Campinas, Instituto de Fisica, Campinas, SP, Brazil

P – Th - B - 226
Proteoglycans Protect the Lung from Mechanical Failure During the Progression of Emphysema
A. TAKAHASHI1, A. MAJUMDAR1, E. BARTOLAK-SUKI1, and B. SUKI1
1Boston University, Boston, MA

P – Th - B - 227
Characterization of In Vivo Pulmonary Elastance: Comparison of Forced Oscillation and Image Registration Techniques
C. OLSON1, A. TAKAHASHI1, B. SUKI1, and B. SUDER2, 3
1Boston University, Boston, MA, 2Beth Israel Deaconess Medical Center, Boston, MA, 3Childrens Hospital, Boston, MA

Track: Respiratory Bioengineering

Modeling of Respiratory Flow

P – Th - B - 228
Effect of Wall Topography on the Wall Mechanical Stresses During Airway Reopening
H. FUJIOKA1 and D. P. GAVER III1
1Tufts University, New Orleans, LA

P – Th - B - 229
A Geometrical Model for Searching an Optimal Vili Density in the Inter-villous Cross-sections of the Human Placenta
A. SEROV1, M. FILOCHE1, C. M. SALAF2, and D. S. GRIEBENKO1
1Ecole Polytechnique, CNRS, Palaiseau, France, 2Placental Analytics LLC, Larchmont, NY

P – Th - B - 230
Dynamic Multiscale Model of the Human Respiratory System
S. KABILAV1, A. KUPRA2, D. ERSTE3, J. CARTSON4, R. JACOB5, K. MINARD5, and R. CORLEY1
1Pacific Northwest National Laboratory, Richland, WA

P – Th - B - 231
Theoretical Considerations when using Mid-expiratory Flow (EF50) to Estimate Changes in Total Lung Resistance, RL
W. T. GOLDSMITH1, 2, J. REYNOLDS2, W. MCKINNEY2, and D. FRAZER1
1NIOSH, Morgantown, WV, 2WWV School of Public Health, Morgantown, WV

Track: Respiratory Biomechanics

P – Th - B - 232
Respiratory Resistance Prior, and After Cessation of Exercise are the Same
J. VOISSOUGHI6, 3, and A. JOHNSON2
1UMD/ESRA, Brookeville, MD, 2University of Maryland, College Park, MD

P – Th - B - 233
A Vertical Clearance Model to Define the Mechanisms Behind Mucociliary Clearance and Interactions
S. LYNCH1, J. CARPENTER1, J. CRIBB1, and R. SUPERFINE1
1University of North Carolina at Chapel Hill, Chapel Hill, NC

P – Th - B - 234
A Comprehensive Lung Model for Studying the Effects of Different Ventilation Regimes on Lung Mechanics and Gas Exchange
M. ISMAIL1, L. YOSHIHARA2, C. ROTH3, and W. A. WALL4
1Technische Universitaet Muenchen, Garching, Germany

P – Th - B - 235
Evidence of the Recruitment-Derecruitment of Lung Units Derived from Previous Surface Tension ( ), and Pressure-Volume (PL – VL) Measurements
D. FRAZER1, J. REYNOLDS2, W. MCKINNEY2, and W. T. GOLDSMITH1
1NIOSH, Morgantown, WV, 2WWV School of Public Health, Morgantown, WV
1:30PM – 5:00PM POSTER SESSION Thurs B

POSTER VIEWING WITH AUTHORS & REFRESHMENT BREAK | 3:00PM - 4:00PM

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Track: Respiratory Bioengineering

Respiratory Bioengineering

P – Th - B - 236
Quantification of Concomitant Oscillations in Cerebral Blood Flow Velocity and Arterial Blood Pressure during Obstructive Sleep Apnea
R. M. ALEX,1 G. BHAVE,1 A. BASHABOYNA1, M. AL-ABED1, S. IYER,1 D. E. WATENPAUGH1, R. ZHANG2, and K. BEHBEHANI3
1University of Texas Arlington, Arlington, TX, 2Hashemite University, Amman, Jordan, 3Sleep Consultants Inc., Fort Worth, TX, 4University of Texas Southwestern Medical Center, Dallas, TX

P – Th - B - 237
Physiologic Airway Models to Explore Surfactant Delivery to Infants
P. BACH1, M. FILOCHE2, J. B. GROTERBERG3, and H. TAVIANI1
1University of Akron, Akron, OH, 2Ecole Polytechnique, Palaiseau Cedex, France, 3University of Michigan, Ann Arbor, MI

P – Th - B - 238
Microfluidic Models of Surfactant and Liquid Plug Delivery in Small Airways
J. B. GROTBERG1, M. K. MULLIGAN2, J. K. SZENITMAN3, and D. K. WASSMAN4
1University of Michigan, Ann Arbor, MI, 2Technion - Israel Technical University, Haifa, Israel, 3Technion-Israel Institute of Technology, Haifa, Israel, 4Carmel Medical Center, Haifa, Israel

Track: Stem Cell Engineering

Bioprocessing of Human Cells

P – Th - B - 239
Derivation of Umbilical Cord Blood-Derived Mesenchymal Stem Cells through TGF-Beta induced Endothelial-to-Mesenchymal Transition
E. BROWN PETERS1, B. LIU1, J. WEST1, and G. TRUSKEY1
1Duke University, Durham, NC

P – Th - B - 240
Mechanical Stiffness as an Indicator of Osteoblastic Human Mesenchymal Stem Cell Differentiation
T. BONGIORNO1, J. KAZLOV1, R. MEZENCEV1, S. GRIFFITHS1, R. OLIVARES-NAVARRETÉ2, J. MCDONALD1, Z. SCHWARTZ1, B. D. BOYAN1, T. C. MCDIVITTY1,2, and T. SULCZEK1
1Georgia Institute of Technology, Atlanta, GA, 2Emory University, Atlanta, GA, 3Virginia Commonwealth University, Richmond, VA

P – Th - B - 241
Alginete Composition Impacts Differentiation Trajectories of Microencapsulated Embryonic Stem Cell Aggregates
J. L. WILSON1, M. NAJIA1, R. SAEID1, and T. C. MCDIVITTY1
1Georgia Institute of Technology, Atlanta, GA, 2The Parker H. Petit Institute for Bioengineering and Bioscience, Atlanta, GA

P – Th - B - 242
Bioprocessing of Adipose-Derived Stem Cells for Removal of Contaminating Cell Types and Improved Quality of Tissue-Engineered Cartilage Constructs
K. OKARSKI1, W. ELLIS1, L. POWERS1, and J. SZIVEK1
1University of Arizona, Tucson, AZ

P – Th - B - 243
3D Expansion of MSC-Like Cells for Clinical Use - Bioprocessing Solutions and Biological Implications
E. ABRAHAM1, M. WADMAN1, A. GILERT1, O. MAKLER1, L. PINZUR1, E. ZAHAVI1, and A. CHAJUT1
1Pluristem Therapeutics, Haifa, Israel

Track: Stem Cell Engineering

iPS Models of Human Disease

P – Th - B - 249
Engineering Cardiac Micro-tissues and Human Induced Pluripotent Stem Cells to Model Desmosome-associated Disease
N. HUEBSCH1, Z. MA2, Y. MIYADAKA2, J. WANG2, M. J. SPINDLER2, C. R. RUSSELL2, L. L. LIZARRAGA1, T. NGUYEN3, J. YOO1, A. CHAN1, P.-A. SO1, K. E. HEALY4, and B. R. CONKLIN1
1Gladstone Institute of Cardiovascular Disease, San Francisco, CA, 2University of California, Berkeley, Berkeley, CA

Track: Stem Cell Engineering

Matrix Control of Stem Cells

P – Th - B - 250
Multiplex Synthetic Matrix Cues Reinject the Therapeutic Potential of Aging Adult Stem Cells
S. W. CROWDER1,2, H. N. LEWIS1, C. M. AMBROSE1, P. A. SHORT1, B. W. SCHMIDT1, S. MURTIVI1, and H.-J. SUN1
1Vanderbilt University, Nashville, TN, 2Vanderbilt University Medical Center, Nashville, TN

P – Th - B - 251
Neural Differentiation of Induced Pluripotent Stem Cells in 3D Matrices
A. MONTGOMERY1, A. WONG1, L. SUN1, and S. M. WILLETHER1
1University of Victoria, Victoria, BC, Canada
**Track: Stem Cell Engineering**

### Mechanical Control of Stem Cells

**P - Th - B - 255**
Automated Assessment of Focal Adhesion-Based Mechanotransduction Candidates
A. W. HOLLE and A. ENGEL
\(^1\) UC San Diego, La Jolla, CA

**P - Th - B - 256**
FAK Control of Fluid Flow-induced ERK Activation in Mesenchymal Stem Cells
A. GOGOS, D. E. MENTER, J. LEE, L. HA, and J. LIM
\(^1\) Grinnell College, Grinnell, IA, \(^2\) University of Nebraska-Lincoln, Lincoln, NE

**P - Th - B - 257**
 Nanotopography Modulates Mechanotransduction of Stem Cells and Induces Differentiation Through Focal Adhesion Kinase
B. K. TEO, \(^1\) S. WON, \(^1\) C. LIM, \(^1\) T. KUNO, \(^1\) L. H. ROMEI, \(^1\) and E. K. YIM \(^1\)
\(^1\) National University of Singapore, Singapore, Singapore, \(^2\) Mechanobiology Institute, Singapore, Singapore, \(^3\) Institute of High Performance Computing, A*STAR, Singapore, Singapore

**P - Th - B - 258**
Epigenetic Modifications During Mechanically Induced Osteogenesis of Mesenchymal Stem Cells
J. C. CHEN, M. C. CHUA, R. B. BELLON, and C. R. JACOBS
\(^1\) Columbia University, New York, NY, \(^2\) University of British Columbia, Vancouver, BC, Canada

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**Track: Tissue Engineering**

### Musculoskeletal and Orthopaedic Tissue Engineering

**P - Th - B - 260**
Tendon Tissue Engineering Using Decellularized Human Umbilical Veins and Adult Stem Cells
B. ENGBRETSON and V. I. SIKAVITSAS
\(^1\) University of Oklahoma, Norman, OK

**P - Th - B - 261**
A Composite Mesh for Ligament Tissue Engineering
P. THAYER, A. DIMULIN, D. PLESSL, M. HAHN, S. GUELCHE, and A. GOLDSTEIN
\(^1\) Virginia Tech, Blacksburg, VA, \(^2\) The Johns Hopkins University, Baltimore, MD

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**P = Poster Session**

**OP = Oral Presentation**
Novel (Poly)caprolactone (PCL) Scaffold Architecture for Tendon Tissue Engineering Applications
B. L. BANK1 and J. L. BROWN1
1The Pennsylvania State University, State College, PA

Development of Biomimetic 3D Bioprinted Scaffolds for Osteochondral Regeneration
B. HOLMES1, J. LI1, J. D. LEE1, and L. G. ZHANG1
1The George Washington University, Washington, DC

Enhanced Osteogenic Differentiation of Stem Cells in Novel Bioactive Cold Plasma Treated Nanostructured Bone Scaffolds
M. WANG1, X. CHENG1, B. HOLMES1, M. KEIDAR1, and L. G. ZHANG1
1The George Washington University, Washington, DC

Sphingosine 1-Phosphate Functionalized Nanopatterned Scaffolds for Engineering Vascularized Skeletal Muscle Tissue
J. H. TSUI1, H. S. YANG1, N. IERONIMAKIS1, D. LIM1, M. REYES1, and D-H. KIM1
1University of Washington, Seattle, WA

Design of a Tendon Graft for Rotator Cuff Injury Repair
M. C. MOUCHOUND1, J. H. ARRIZABALAGA1, K. P. KESTER1, A. R. PASCOE1, and M. U. NOLLERT1
1University of Oklahoma, Norman, OK

Healing Cascade Design for Cartilage Regeneration by Endogenous Synovial Stem Cell Recruitment
W. S. VAN DEN BERG-FOELS1,2
1Clemson University, Charleston, SC, 2Medical University of South Carolina, Charleston, SC

A Magnesium-Based Ring for Healing of an Injured Anterior Cruciate Ligament - Design and In Vitro Robotic Testing
K. F. FARRARO1, N. SASAKI1, H. S. EASON1, K. E. KIM1, and S. L-Y. WOO1
1University of Pittsburgh, Pittsburgh, PA

A Mesenchymal Stem Cell Derived Extracellular Matrix Approach for Cartilage Repair
N. FARHANG1, M. POLE1, M. B. CHRISTENSEN1, and P. A. TRESCO1
1University of Utah, Salt Lake City, UT

Synthesis of a Novel Poly(caprolactone) Based Elastomer for Bone and Cartilage Tissue Regeneration.
M. D. HARMON1, C. BADALUCCO2, R. JAMES3, and S. G. KUMBAR3
1University of Connecticut, Storrs-Mansfield, CT, 2University of Connecticut Medical School, Farmington, CT, 3University of Connecticut Health Center, Farmington, CT

In Vitro Characterization of Organic-Inorganic Composite Lypolized Gelatin Sponges for Bone Regeneration
A. RODRIGUEZ1, S. A. SELL1, J. M. MCCOOL1, G. SAXENA1, A. J. SPENCE1, D. ABBAYEH1, and G. L. BOWLIN1
1Virginia Commonwealth University, Richmond, VA, 2Saint Louis University, Saint Louis, MO II

Poly(caprolactone)-graphene Nanocomposite Scaffolds for Tissue Engineering
S. MUKUNDAN1, V. SANT2, and S. SANT2
1University of Pittsburgh, Department of Pharmaceutical Sciences, Pittsburgh, PA, 2University of Pittsburgh, Department of Pharmaceutical Sciences & Biomedical Engineering, Pittsburgh, PA, 3McGowan Institute for Regenerative Medicine, Pittsburgh, PA

Bone Matrix Formation on Oxidized Carbon Based Nanomaterial Films
S. C. PATEL1, J. RASHKOV1, and B. SITHARAMAN1
1Stony Brook University, Stony Brook, NY

Chondrogenic and Osteogenic Pre-differentiation of Mesenchymal Stem Cells for Osteochondral Tissue Engineering using Bilayered Hydrogels
J. LAM1, S. LU1, A. G. MIKOS1, and F. K. KASPER2, M. SANTORD2
1Rice University, Houston, TX
Thursday, September 26, 2013
1:30PM – 3:00PM
PLATFORM SESSION – THURS – 2

Track: Tissue Engineering
OP - Thurs - 2 – 1 - Room 6B
Cardiovascular Tissue Engineering I

Chairs: Warren Grayson, Jianjun Guan

1:30PM
Electrospun Biodegradable Elastic Polyurethane Fibers with Dipyridamole Release for Vascular Engineering
P. PURNAPRIYAKASHMI1, K. T. NGUYEN1, and Y. HONG2
1University of Texas at Arlington, Arlington, TX

1:45PM
3D In Vitro Cardiac Microtissues with Perfused Human Capillaries
M. L. MOYA1, L. ALONZO2, J. WANG3, K. CHRISTIAN3, and S. C. GEORGE1, 2
1University of California, Irvine, Irvine, CA, 2University of California, San Diego, San Diego, CA, 3The Edwards Lifesciences Center for Advanced Cardiovascular Technology, Irvine, CA

2:00PM
The Tale of Two Types: The Role of Sphingosine 1-Phosphate Receptor Three in the Angiogenic Recruitment of Anti-Inflammatory Macrophages
A. O. AWODODU1, M. E. OGLE1, K. MARTIN1, S. PEIRCE-COTTLER1, and E. A. BOTCHWEY1
1Georgia Institute of Technology, Atlanta, GA, 2University of Virginia, Charlottesville, VA

2:15PM
The Role of Cyclic Flexure and Oscillatory Shear Stress on Mesenchymal Stem Cell Proliferation and Extracellular Matrix Production in Engineered Heart Valve Tissue Formation
J. S. SOARES1, T. B. LEI1, F. SOTIROPOULOS1, and M. S. SACKS1
1University of Texas at Austin, Austin, TX, 2University of Minnesota, Minneapolis, MN

2:30PM
"Vasculogenic Mimicry" as a Model for Understanding Endothelial-like Stem Cell Behavior
J. A. RYLETWISKI1, A. A. ALDOW1, E. LEWIS1, N. HASEGAWA1, and L. SUGGS1
1The University of Texas at Austin, Austin, TX

2:45PM
Time-course of Healing and Maturation of Implantable Vascular Grafts in the Arterial System of an Ovine Model: Do We Need Cells in the Vascular Wall?
S. ROW1, H. PENG1, E. M. SCHLACH1, D. D. SWARTZ1, 2, and S. T. ANDREADIS1, 2
1University at Buffalo, Buffalo, NY, 2New York State Center of Excellence, Buffalo, NY

Track: Biomaterials
OP - Thurs - 2 – 2 - Room 6C
Micro and Nanostructured Materials II

Chairs: Jeff Jacot, Harini Sundararaghavan

1:30PM
Photolabile Hydrogel Micropatterning for Cell Capture on Individually Addressable Microbeads
C. SITANEN1, D-S. SHIN1, and A. REVZIN1
1University of California, Davis, CA

1:45PM
Projection Micro-StereoLithography (PµSL) Printed PDMS Substrates for the Study of Flap Revascularization in an Ischemic Mouse Model
E. L. HEDBERG-DIRK1, T. R. HOWDIESHELL2, K. N. CICOTTE1, and P. MCGUIRE2
1University of New Mexico, Albuquerque, NM, 2University of New Mexico School of Medicine, Albuquerque, NM

2:00PM
Building 3-D μMuscle In Vitro from Patterned Extracellular Matrix Stiffness and Adipose-derived Stem Cells
Y. CHOI1, M. ONDECK1, L. VINCENT1, A. LEE1, M. DOBKE1, and A. ENGLER1
1University of California, San Diego, La Jolla, CA

2:15PM
Engineering Laminin Micropatterned Surfaces to Maximize the Alignment and Contractility of Skeletal Muscle Tissue
R. DUFFY1 and A. W. FEINBERG1
1Carnegie Mellon University, Pittsburgh, PA

2:30PM
Hydrogel-Based Microcontact Printing of Conducting Polymers for Cell Studies
S. PARK1 and S. MAJD1
1Penn State University, University Park, PA

2:45PM
Cell Behavior on Chemically Patterned and Physically Modified PDMS Surfaces
M. M. STANTON1, C. MALLCUIT1, W. G. MCGIMPSEY1, and C. R. LAMBERT1
1Worcester Polytechnic Institute, Worcester, MA, 2Kent State University, Kent, OH

Track: Biomaterials
OP - Thurs - 2 – 3 - Room 606
Biomaterials for Immunoengineering II

Chairs: Julia Babensee, Jai Rudra

1:30PM
Controlled Release of Microshell-Encapsulated Outer Membrane Vesicle Vaccines Results in Self-Adjuvanting, Self-Boosting TH1-Biased Immunity
J. A. ROSENTHAL1, K. ARBSTIEN1, C. LEIFER1, and D. PUTNAM1
1Cornell University, Ithaca, NY

1:45PM
Pollen Grains: Novel Materials for Oral Vaccination
S. ATWE1, H. GILL1, and Y. MAI1
1Texas Tech University, Lubbock, TX

2:00PM
Intravaginal Recruitment of Dendritic Cells for Nanoparticle Transport Using DC Chemokines
R. RATHNAWATH1, W. LYKINS1, H. BENNETT1, J. PARK1, and K. A. WOODROWN1
1University of Washington, Seattle, WA

2:15PM
An Immunomodulatory Protein Coating that Mitigates the Host Response to Implanted Biomaterials
Y. KIM1, R. QUE1, S-W. WANG1, and W. LIU1
1Univ of California, Irvine, Irvine, CA

2:30PM
A Multifunctional Immunomodulatory Scaffold to Engineer the Dendritic Cell Environment For Allograft Acceptance
S. SHIVASA1, G. PATEL1, U. GOH1, and J. E. BABENSEE1
1Georgia Institute of Technology, Atlanta, GA
2:00PM
Multi-scale Analysis of Composition and Structure of Osteogenesis Imperfecta Murine Bone
Z. R. BART1, M. A. HAMMOND2, and J. M. WALLACE1,2
1Indiana University - Purdue University Indianapolis, Indianapolis, IN, 2Purdue University, West Lafayette, IN

2:15PM
Biomechanical Testing of Salter-Harris Fractures Type I and II in the Distal Femur and Proximal Tibia
M. M. ROGERS1, A. BERTRAM3, J. D. DESJARDINS1, C. HYDORN2, M. KANWISHER3, and K. NATHAN1
1Clemson University, Clemson, SC, 2Moore Orthopaedic Clinic, Columbia, SC, 3University of South Carolina School of Medicine, Columbia, SC

2:30PM
Timed Administration of Cyclosporin A Supplements Reveals Multiple Routes to Rescuing Loading Induced Bone Formation at Senescence
R. Y. KIVON1, D. THREAT1, E. M. GARDINER1, L. E. WORTON1, T. S. GROSS1, and S. SRINIVASAN1
1University of Washington, Seattle, WA

2:45PM
Trabecular Bone Adaptation in Response to Exercise is Regulated by Systemic PTH Release
J. GARDINER1, F. MOHAMED1, and D. KOHN1
1University of Michigan, Ann Arbor, MI

Track: Cancer Technologies
OP - Thurs - 2 – 6 - Room 609
Bioengineering of Cancer II

1:30PM
Epithelial Cells Enhance the Invasion of Carcinoma Cells via Promoting Protrusion Formation
M. LEE1, J. AIHWA1, P-H. WU1, and D. WIRTH1
1Johns Hopkins University-Physical Sciences-Oncology Center, Baltimore, MD

1:45PM
Loss of Giant Obscurins Promotes a Metastatic Phenotype in Breast Epithelium
K. M. STROKA1, M. SHRIVER1, K. KONSTANTOPOULOS2, and A. KONTROGIANNI-KONSTANTOPOULOS2
1Johns Hopkins University, Baltimore, MD, 2University of Maryland School of Medicine, Baltimore, MD

2:00PM
Biomaterial Scaffolds for Early Detection of Breast Cancer Metastasis
S. M. AZARIN1, R. M. GOVER1, B. A. AGUADO2, J. YI1, J. S. JERUSI1, V. BACKMAN1, and L. D. SHEA1
1Northwestern University, Evanston, IL

2:15PM
Stromal-like Cation Concentrations Induce Adhesive Heterogeneity in Metastatic Cancer Cells
A. FUHRMANN1, T. D. TLSY1, and A. J. ENGLER1
1University of California San Diego, La Jolla, CA, 2University of California San Francisco, San Francisco, CA

2:30PM
Lamins Modulate Nuclear Deformability and Transit Through Narrow Constrictions of Cancer Cells
C. DENNIS1, U. JOHNALAGADD1, M. ZWERVER1, M. KRAUSE1, K. WOLFF1, L. VADBAT1, and J. LAMMERDING1
1Cornell University, Ithaca, NY, 2University of Zürich, Zürich, Switzerland, 3Radboud University Nijmegen Medical Center, Nijmegen, Netherlands, 4Weill Cornell Medical College, New York, NY
2:45PM
Fibronectin Domains Targeting Individual Murine Fc gamma Receptors Modulate Tumor Control
T. F. CHEN, K. LI, and K. D. WITRUP
1Massachusetts Institute of Technology, Cambridge, MA

Track: Cardiovascular Engineering
OP - Thurs - 2 – 7 - Room 612

Thrombosis and Hemostasis
Chairs: Eno Ebong, Joyce Wong

1:30PM
Combined Effects of Shear Rates and Platelet Therapy Dosage on Thrombosis in a Microfluidic System
M. LI, N. A. HOTAIING, and C. R. FOREST1
1Georgia Institute of Technology, Atlanta, GA

1:45PM
Microfluidic Assay of Platelet Deposition on Collagen Using Perfusion of Whole Blood From Healthy Subjects Taking Aspirin
R. LI, S. FRIEY, K. LI, T. GROSSER, and S. DIAMOND
1Institute for Medicine and Engineering, University of Pennsylvania, Philadelphia, PA

2:00PM
Perturbations in Local Clot Hemodynamics Triggers Intraluminal Thrombus Contraction
R. W. MUTHARD and S. L. DIAMOND
1University of Pennsylvania, Philadelphia, PA

2:15PM
Exploring the Impact of Fluid Shear Stress Level and Flow Pattern on VWF Degradation
S. YANG, V. TURITTO, and Z. N. DEMOU
1Illinois Institute of Technology, Chicago, IL

2:30PM
Thrombin Generation and Fibrin Formation Under Flow on Biomimetic Tissue Factor Rich Surfaces
A. ONASOGA and K. NEEVES
1Colorado School of Mines, Golden, CO

2:45PM
Platelet Size and Stiffness, Vessel Size and Shear Rate Govern Platelet Transport to Growing Thrombi
M. MEHRABADI, C. AIDUN, and D. KU
1Georgia Institute of Technology, Atlanta, GA

1:45PM
Mechanosensitive Kinases Regulate Stiffness-Induced Cardiomyogenesis
J. L. YOUNG, K. KRETCHMER, A. ZAMBON, and A. J. ENGEL
1University of California, San Diego, La Jolla, CA

2:00PM
Fibronectin and Type I Collagen Synergy in Tumor Progression
K. WANG, R. ANDRESEN-EGUILUZ, B. SEO, S. HU, V. BENSON, C. FISCHBACH, and D. GOURLON
1Cornell University, Ithaca, NY

2:15PM
Tissue Elasticity Provores a Pro-Inflammatory Reaction in Innate Immune Cells
M. L. PREVITERA, A. SENGUPTA, and T. M. MIRZA
1New Jersey Neuroscience Institute, Edison, NJ

2:30PM
Actin Architecture and Contractile Force Regulate the Anisotropy of Endothelial Cell Mechanosensitivity to Directional Substrate Stretch
Y. SHAO, J. MANN, and J. FU
1University of Michigan, Ann Arbor, Ann Arbor, MI

Track: Cellular and Molecular Bioengineering
OP - Thurs - 2 – 9 - Room 611

Cell Motility II
Chairs: Michael Cho, Omolola Eniola-Adefeso

1:30PM
Distinct Signaling Mechanisms for Integrin-Mediated Migration in Unconfined Versus Confined Spaces
W.-C. HUNG, S.-H. CHEN, C. PAUL, K. STROKA, J. YANG, and K. KONSTANTOPoulos
1Johns Hopkins University, Baltimore, MD, Center for Cancer Nanotechnology Excellence, Baltimore, MD

1:45PM
Migratory Patterns of Cells in the Presence of Opposing Chemical and Mechanical Cues
G. JAIN and P. RAJAGOPALAN
1Virginia Tech, Blacksburg, VA

2:00PM
The Highly Predictive Functional Relationship Between Focal Adhesion Morphology and Cell Migration
D.-H. KIM and D. WIRTZ
1Johns Hopkins University, Baltimore, MD, Institute for NanoBio Technology, Baltimore, MD

2:15PM
Single-Cell Dynamics of Collective Cell Migration in Microfluidic Chemokine Gradients
S. TAY, T. FRANK, and M. MEHLING
1ETH ZURICH, Basel, Switzerland

2:30PM
Bioactive Chemokine-Conjugated Surfaces for Studying Haptotactic Immune Cell Migration
V. VERNEKAR, C. WALLACE, M. WU, J. CHAO, A. RALEIGH, X. LIU, J. HAUGHEY, and W. REICHERT
1Duke University, Durham, NC, North Carolina State University, Raleigh, NC
2:45PM
Microfluidic Platform for On-Demand, Competitive, Large-Scale Chemotaxis Assays of Neutrophils
H. CHOI, B. HAMZA, E. A. WONG, AND D. IRMA
1Harvard Medical University/MSH, Charlestown, MA

2:00PM
Synergistic Drug Targets of Human Pathogens Identified with Analysis of Integrated Transcriptional Regulatory and Metabolic Networks (Invited)
J. PAPIN
1University of Virginia, Charlottesville, VA

2:30PM
Systems Approaches to Multi-Parameter Disease Diagnostics (Invited)
N. D. PRICE
1Institute for Systems Biology, Seattle, WA

Track: Device Technologies and Biomedical Robotics
OP - Thurs - 2 – 10 - Room 602

Biosensors II

Chairs: Padma Rajagopalan, Siyang Zheng

1:30PM
Point of Care Diagnostics for Inborn Errors of Metabolism
O. AYUB1, A. BEHRENS1, M. NATOLI1, J. AYUB1, J. CABRERA-LUQUE2, G. CUNNINGHAM3, M. SUMMAR4, J. MARUGAN5, A. SIMEONOV5, AND P. KOFINAS1
1University of Maryland, College Park, MD; 2Children’s National Medical Center, Washington, DC; 3NCATS NIH, Rockville, MD

1:45PM
Serologic and Phenotypic Analysis of Blood via Silicon Photonics
J. KIRK1, N. STENDER2, F. HANSEN3, K. LANNERT4, J. JOHNSON5, AND D. M. RATNER1
1University of Washington, Seattle, WA; 2Puget Sound Blood Center, Seattle, WA

2:00PM
Telemetry Monitoring of Liver Perfusion and Oxygenation In Vivo
T. J. AKL1, M. A. WILSON2, M. N. ERICSON3, E. FARQUHAR4, AND G. L. COTE5
1Texas A&M University, College Station, TX; 2Veterans Affairs Pittsburgh Healthcare System, Pittsburgh, PA; 3University of Pittsburgh, Pittsburgh, PA; 4Oak Ridge National Laboratory, Oak Ridge, TN

2:15PM
Photonic Crystal Based Biosensor for Label-free Detection of Cardiac Biomakers
B. ZHANG1, R. PETERSON2, J. M. VELA1, L. TANG1, AND J. YE1
1University of Texas at San Antonio, San Antonio, TX

2:30PM
A Liposome-based Impedance Sensing Device for Biological Detection
G. L. DAMHORST1, C. E. SMITH1, E. M. SALMI1, M. M. SOBIERAJ2, H. NI1, H. KONG1, AND R. BASHIR1
1University of Illinois at Urbana-Champaign, Urbana, IL

2:45PM
A Point-of-Care Cell Counter for HIV/AIDS Diagnostics
U. HASSAN1, N. N. WATKINS2, G. DAMHORST3, W. RODRIGUEZ4, AND R. BASHIR1
1Department of Electrical and Computer Engineering, University of Illinois Urbana Champaign, Urbana, IL; 2Micro and Nanotechnology Laboratory, University of Illinois Urbana Champaign, Urbana, IL; 3Department of Bioengineering, University of Illinois Urbana Champaign, Urbana, IL; 4Daktani Diagnostics, Inc., Cambridge, MA

Track: Biomedical Imaging and Optics
OP - Thurs - 2 – 11 - Room 615
Optical Imaging and Microscopy

Chairs: Andreas Hielscher

1:30PM
Computational Imaging and High-throughput 3D Tracking of Human Sperms
T-W. SU1, L. XUE1, AND A. OZCAN1
1University of California, Los Angeles, CA

1:45PM
Using the Parallelized High-Throughput Microscope to Greatly Accelerate Microrheology Experiments
J. A. CRIBB1, L. OSBORNE1, P. HEENAN1, J. HSIAO1, L. VICCI1, R. TAYLOR2, AND R. SUPERFINE1
1University of North Carolina - Chapel Hill, Chapel Hill, NC
2:00PM
High-Throughput Partial Wave Spectroscopic Microscopy for Early Cancer Detection
J. E. CHANDLER1, H. SUBRAMANIAN1, C. D. MANEVAL1, C. A. WHITE1, and V. BACKMAN1
1Northwestern University, Evanston, IL

2:15PM
Computational Field-Portable Microscope for On-Chip Imaging of Confluent Samples
A. GREENBAUM1, N. AKBAR1, and A. OZCAN1,2
1Electrical Engineering Department, University of California, Los Angeles, CA
2Bioengineering Department, University of California, Los Angeles, CA

2:30PM
The Optics Of Low-Cost Microscopy
A. Q. AN,2 C. D. REBER1, M. BAKALAP1, M. V. D’AMBROSIO1, A. SKANDARAJAH1, R. N. MAAMARI1, and D. A. FLETCHER1
1University of California Berkeley, Berkeley, CA; 2University of California Irvine, Irvine, CA

2:45PM
Can Capillaries Grown in 3D Culture be Imaged without the Use of an Optical Lens System?
J. WEIDING1, S. SIKMAN1, A. GREENBAUM1, A. OZCAN1, and E. BOTVINICK1
1University of California Irvine, Irvine, CA; 2University of California Los Angeles, Los Angeles, CA; 3University of California Irvine, Irvine, CA

Track: Nano to Micro Technologies
OP - Thurs - 2 – 14 - Room 619

BioMEMS II

1:30PM
Sophisticated Point-of-care Diagnostic Devices Based on 2D Paper Networks (Invited)
P. TAGER
University of Washington

2:00PM
A Milliseconds Microfluidic Chaotic Bubble Mixer for Polymer-DNA Nanocomplex Synthesis
M. LU1, Y.-P. HO1, C. GRISBY2, D. AHMED1, K. LEONG1, and T. HUANG1
1Pennsylvania State University, University Park, PA; 2Duke University, Durham, NC; 3Aarhus University, Aarhus, Denmark

2:15PM
Kinetic Polyacrylamide Gel Electrophoresis (KPAGE): Microfluidic Binding Assay Enables Measurements of Kinetic Rates for Immunoassay Quality Assessment
M. A. KAPL1, K. APORI1, and A. E. HERR1
1University of California, Berkeley, Berkeley, CA

2:30PM
Using Actuating Surface Attached Posts (ASAPs) to Measure Clotting Time for Point of Care Diagnostics
R. JUDITH1, J. FISHER1, T. A. MANGALDA1, R. C. SPERO2, B. J. OBERHARD1,3, B. FISHER3, M. FALVO1, R. M. TAYLOR1,2, and R. SUPERFINE1,2
1University of North Carolina, Chapel Hill, NC; 2Rheonics Inc., Chapel Hill, NC; 3North Carolina State University, Raleigh, NC; 4High Point University, High Point, NC

2:45PM
Improved Microarray Readout By Fluorescence Micro-Confinement
D. V. NICOLAU1 and S. V. DOBRIOU1
1McGill University, Montreal, QC, Canada

Track: Drug Delivery
OP - Thurs - 2 – 15 - Room 620

Nano to Micro Devices in Delivery

Chairs: Fan Yang, Qun Wang

1:30PM
Stimuli Responsive All Polymeric Untethered Grippers
J. BREGA1, C. YOON1, K. MALACHOWSKI1, M. WANG2, J. FISHER1, and D. GRACIAS1
1Johns Hopkins University, Baltimore, MD; 2University of Maryland, College Park, College Park, MD

1:45PM
Rapid Synthesis of Monodisperse Biodegradable PEG Microspheres for Controlled Protein Release
L. DEVEZA1, M. KEENEY1, and F. YANG1
1Stanford University, Stanford, CA

2:00PM
Phospholipid-PEG Coated Superparamagnetic Irox Oxide Nanoparticles for Drug Delivery and Hyperthermia
C. QUINTO1,2 and G. BAO1,2
1Georgia Institute of Technology, Atlanta, GA; 2Emory University, Atlanta, GA

2:15PM
Planar Bioadhesive Microdevices for Enhanced Oral Drug Delivery
T. A. DESAI1, H. D. CHIRMA1, L. C. SHAO2, and N. C. CIACCO1
1University of California at San Francisco, San Francisco, CA

2:30PM
Quantum Dot Conjugated Magnetic Nanoparticles for Targeted Drug Delivery and Imaging in the CNS
I. VENUGOPAL1 and A. LINNIER1
1University of Illinois at Chicago, Chicago, IL

2:45PM
Rapidly-Dissolvable Micro-needle Patches via a Highly Scalable and Reproducible Soft Lithography Approach
A. R. JOHNSON1, C. F. ARCHULETA1, K. A. MOGA1, L. R. BICKFORD1, J. XU2, R. D. GEIL1, G. OWENS2, B. BERGGLUND1, C. LIFT1, and J. M. DESIMONE1,2
1University of North Carolina at Chapel Hill, Chapel Hill, NC; 2Liquida Technologies, Morrisville, NC

Track: Neural Engineering
OP - Thurs - 2 – 16 - Room 613

Brain Injury

Chairs: David Shreiber, Pam VandeVord

1:30PM
A Porcine Model of Primary Blast-Induced Traumatic Brain Injury
D. K. CULLEN1, M. SKOTAK2, C. J. MIETUS1, J. FRASCA2, F. WANG3, K. D. BROWNE1, D. H. SMITH1, and N. CHANDRA1
1University of Pennsylvania, Philadelphia, PA; 2University of Nebraska-Lincoln, Lincoln, NE

1:45PM
A Novel Mouse Model of Blast Brain Injury: Blast Conditions Seen in Theater
A. W. YU1, H. WANG1, K. A. MATTHEWS1, D. LASKOWITZ2, and C. R. BASS1
1Duke University, Durham, NC

2:00PM
Alginate Microencapsulation of Mesenchymal Stem Cells Enhances Modulation of the Inflammatory Response in Astrocyte and Organotypic Hippocampal Slice Cultures
E. STUCK1, R. SCHLOSS1, M. L. YARMSH1, and D. I. SHREIBER1
1Rutgers University, Piscataway, NJ
2:15PM  
Pro-Oxidative and Pro-Inflammatory Environments Contribute to Blast-Induced Neurotrauma  
H. J. Cho1, S. Sajja1, P. J. Vandevord2, and Y. W. Lee1  
1Virginia Polytechnic Institute and State University, Blacksburg, VA; 2Veterans Affairs Medical Center, Salem, VA  

2:30PM  
Effects of Shoulder Torque on Hand Function in Stroke: Implications for Control of Assistive Devices  
L. Miller1 and J. Dewald3  
1Northwestern University, Chicago, IL  

2:45PM  
Spontaneous Extension-Adduction Coupling in the Post-Stroke Lower Extremity  
N. Sanchez1, R. Lopez-Rosado1, and J. P. Dewald1  
1Northwestern University, Chicago, IL  

Track: New Frontiers and Special Topics
OP - Thurs - 2 – 17 - Room 614

Diagnostics
Chairs: Anubhav Tripathi, Jung Suh

1:30PM  
Microfluidics-Based Diagnosis-On-A-Chip By Enzyme Activity Detection  
S. Jull1, J. Oubrusca2, Y-P. Ho3, B. Khudser4, H-C. Yeh5, and K. Leong1  
1Duke University, Durham, NC; 2University of Texas at Austin, Austin, TX; 3University of Arkansas, Fayetteville, AR; 4Aarhus University, Aarhus, Denmark  

1:45PM  
Digital High Resolution Melt Analysis: A Novel Approach to Broad-Based Profiling of Heterogeneous Biological Samples  
S. I. Fraley1, J. S. Yang1, and T-H. Wang1  
1The Johns Hopkins School of Medicine, Baltimore, MD; 2The Johns Hopkins University, Baltimore, MD  

2:00PM  
Paper-Based Sample Preparation for Disposable Molecular Diagnostics at the Point-of-Care  
J. C. Linnes1 and C. M. Klapferich1  
1Boston University, Boston, MA  

2:15PM  
A Rapid, Real-Time Multiplex PCR for Detecting and Sub-Typing Clostridium difficile Using a Novel Droplet Sandwich Platform  
S. Angione1, A. Sarma2, L. Mermel2,3, and A. Tripathi4  
1School of Engineering, Center for Biomedical Engineering, Brown University, Providence, RI; 2Harvard Medical School, Boston, MA; 3Division of Infectious Diseases, Rhode Island Hospital, Providence, RI; 4Warren Alpert Medical School, Brown University, Providence, RI  

2:30PM  
Paper-Based Assay for Influenza Hemagglutinin Using Computationally Designed Affinity Protein  
C. A. Holstein1, S. Bennett1, A. Chevalier1, D. Baker1, E. Fu1, and P. Yager1  
1University of Washington, Seattle, WA  

2:45PM  
Microfluidic System For Automated, Quantitative Flow Cytology  
J. S. Dudani1, A. P. Tav1, A. Arshi1, R. J. Lee1, H. T. Tse1, D. R. Gossett1, and D. Di Carlo1  
1University of California, Los Angeles, Los Angeles, CA  

Track: Biomaterials
OP - Thurs - 2 – 18 - Room 6E

Biomaterial Scaffolds I
Chairs: Gulden Camci-Unal, Mariah Hahn

1:30PM  
Winged Fiber Scaffolds Enhance hASC Proliferation, Osteogenesis, and Mechano-sensitivity  
S. A. Tur1, S. M. Miller1, D. J. Cunningham1, W. T. Pfeiler1, S. H. Bernacki1, B. Pourdeyhimi1, and E. G. Loboa1,2  
1North Carolina State University and University of North Carolina, Raleigh, NC; 2North Carolina State University, Raleigh, NC  

1:45PM  
Photopolymerization Mechanism Impacts Cartilage Development in Poly(ethylene glycol) Hydrogels  
J. Roberts1 and S. J. Bryant1,2  
1University of Colorado, Boulder, CO; 2BioFrontiers Institute, Boulder, CO  

2:00PM  
Nano-grafts for ACL Reconstruction: In Vitro and In Vivo Characterization  
S. E. Smith1, S. Grant1, and R. White1  
1University of Missouri, Columbia, MO  

2:15PM  
Alkylation of Keratin for a Tunable Biomaterial Platform in Bone Regeneration  
S. Han1, T. Ham1, and J. M. Saul1  
1Miami University, Oxford, OH  

2:30PM  
Engineering a Muscle Mimetic ECM Biomaterial  
S. Hurd1, B. Kasukonis1, K. Cherry1, S. Ahmadi1, and J. Wolchok1  
1University of Arkansas, Fayetteville, AR; 2University of Arkansas for Medical Sciences, Little Rock, AR  

2:45PM  
Osteochondral Differentiation Of Rat Bone Marrow Stem Cells In Raw Material Encapsulated Microsphere Based Gradient Scaffolds  
V. Gupta1 and M. S. Detamore1  
1University of Kansas, Lawrence, KS
**ABET Workshop**

1:30pm - 5:00pm  
Room 603  
The BMES Accreditation Activities Committee and BMES Education Committee present a workshop for the 2013 BMES Annual Meeting addressing the ABET assessment process and program specific criteria from a faculty perspective. Speakers include: John Gassert, Dan Cavanaugh, John Enderle and Jim Sweeney. The workshop will also convene a faculty panel to discuss preparing for the ABET site visit with tips from the trenches. Panelists include: Ann Saterbak, Jameel Ahmad, John Desjardins, Dan Cavanaugh, and Angie Louie.

**BMES-NSF Special Session: Promoting and Sustaining Innovative Research**  
1:30PM - 5:00PM  
Room 204  
BMES and the National Science Foundation (NSF) will convene a special session focused on promoting and sustaining innovative research in biomedical engineering. The session will bring together NSF Bioengineering and Engineering Healthcare grantees, junior faculty, post-doctoral fellows and graduate students for idea exchange and networking related to conducting and funding cutting-edge research in BME. This material is based upon work supported by the National Science Foundation under Grant No. CBET-1343145. The session will highlight NSF funded research, inform participants on how to develop winning grant proposals and provide ample opportunity for networking and community building for those directing independent research and those aspiring to do so. It is expected participants at all levels will gain an increased awareness of NSF research, gain a better understanding of NSF funding opportunities and prepare successful grant applications and potentially establish new relationships that may lead to collaborations in the future.

**Korea-US Joint Workshop in Biomedical Engineering**  
4:00PM – 5:30PM  
Room 201  
The goal of the Joint Workshop between the Korean Society of Medical and Biological Engineering (KOSOMBE) and BMES is to promote cooperation, collaboration and networking between the two societies and their members.

**Invited speakers:**  
Robert Nerem (Georgia Tech)  
Luke Lee (University of California, Berkeley)  
Hanjoong Jo, (Emory University and Georgia Tech)  
Sanghoon Lee (Korea University)  
Jungwook Shin (Inje University)  
Yoonkey Nam (KAUST)
Thursday, September 26, 2013
4:00PM – 5:30PM
PLATFORM SESSIONS – THURS – 3

Track: Tissue Engineering
OP - Thurs - 3 – 1 - Room 6B

Cardiovascular Tissue Engineering II

Chairs: Jeff Holmes, Shelly Peyton

4:00PM
FLIM Phasor Analysis Characterizes Cardiomyocyte Metabolic Maturation by Cardiomyocyte-derived Matrix
D. D. Tran1, M. L. Moya2, R. Datta1, M. A. Degman1, J. J. Wang2, K. L. Christman1, E. Gratton1, and S. C. George1
1 University of California, Irvine, Irvine, CA, 2 University of California, San Diego, San Diego, CA

4:15PM
Sustained Oxygenation Stimulated Cardiac Differentiation of Cardiosphere Derived Cells Under Hypoxic Condition
J. Guan1 and Z. Li1
1 Ohio State University, Columbus, OH

4:30PM
Engineered Cardiac Micro-Tissue Spheres Electrically Integrate and Maintain Heart Function After Infarction
K. A. Beres1, K. L. Kreutziger2, S. Dupras1, X. Yang1, V. Muskheili1, and C. E. Murray1
1 University of Washington, Seattle, WA

4:45PM
Stepwise, Solubilization-Based Antigen Removal Maintains Xenogeneic Scaffold Recellularization Capacity
M. L. Wong1, C. Sonderegard2, J. L. Wong1, and L. G. Griffiths1
1 University of California, Davis, Davis, CA, 2 University of California, Davis, Sacramento, CA

5:00PM
Generation of Dynamically-Perfused Functional Vascular Network System within Hydrogel using 3D Bio-Printing Technology
V. K. Lee1, S-S. Yoo2, P. A. Vincent3, and G. Dai1
1Rensselaer Polytechnic Institute, Troy, NY, 2Bingham and Women’s Hospital, Harvard Medical School, Boston, MA, 3Albany Medical College, Albany, NY

5:15PM
Aligned Engineered Microvessels with High Lumen Density via Cell-Induced Fibrin Gel Compaction and Intestinal Flow
K. T. Morin1, J. L. Dhies-Devlin2, and R. T. Tranquillo1
1 University of Minnesota, Minneapolis, MN

Track: Biomaterials
OP - Thurs - 3 – 2 - Room 6C

Micro and Nanostructured Materials III

Chairs: Akhilesh Gaharwar, Justin Saul

4:00PM
Microfluidic Core-Shell Beads for Tumor Spheroid Culture
C. L. Barley1, L. Yu1, and K. Cheung1
1 University of British Columbia, Vancouver, BC, Canada

4:15PM
Albuminated Glycoenzymes: A New Class of “All-Natural” Single Enzyme Nanoparticles
D. W. Ritter1, J. R. Roberts1, J. M. Newton1, B. B. Coller1, and M. J. McShane1
1 Texas A&M University, College Station, TX

4:30PM
Solid Lipid Nanoparticles (SLNs) made of Free Fatty Acids (FFAs) in the Fight Against Nosocomial Infections
E. N. Taylor1, K. M. Kummer2, D. Dyondi1, R. Banerjee2, and T. J. Webster1
1 Northeastern University, Boston, MA, 2 Indian Institute of Technology, Mumbai, India

4:45PM
Cytotoxicity of 1-D & 2-D Carbon Nanostructure Reinforced Poly(propylene fumarate) Nanocomposites
B. Farshidi1, G. Lalwan1, and B. Sitharaman1
1 Department of Bioengineering, Stony Brook University, Stony Brook, NY, 2 Stony Brook University, Stony Brook, NY

5:00PM
Isolating Circulating Fetal Cells from Maternal Blood Using Naturally Occurring Nanotubes
Y. Geng1, A. D. Hughes1, J. C. Mattison1, M. Provençal2, P. Miron3, and M. R. King1
1 Cornell University, Ithaca, NY, 2 Centre de procréation FERTILYS/Prenagen Inc, Terrebonne, QC, Canada

5:15PM
A Paradigm for Quantifying the Elution of Biomaterials in Tissue
T. W. Lancon1 and F. J. Clibb1
1 Texas A&M University, College Station, TX

Track: Biomaterials
OP - Thurs - 3 – 3 - Room 606

Therapeutic Biomaterials I

Chairs: Craig Duvall, John Wilson

4:00PM
Controlled/Living Radical Polymerization: The Impact of Near-Precision Polymer Synthesis on the Field of Biomaterials (invited)
S. Pun1
1 University of Washington, Seattle, WA

4:30PM
Hydrogels for Transplantation of iPSC-NPC After Stroke
J. Lam1, W. Lowry2, S. Carmichael1, and T. Segura1
1 University of California, Los Angeles, CA

4:45PM
Ammon Hydrogel Accelerates Skin Wound Healing
S. V. Murphy1, A. Skerdelaj1, R. Haus1, L. Song1, J. D. Jackson1, J. Yoo1, S. Soker1, and A. Atala1
1 Wake Forest Institute for Regenerative Medicine, Winston-Salem, NC, 2 Shanghai Jiao Tong University, Shanghai, China, People’s Republic of, 3 Institute for Stem Cell and Regenerative Medicine, Seattle, WA

5:00PM
Sortase-Mediated Initiator Attachment Enables High Yield In Situ Growth of a PEG-Based polymer from the C Terminus of Proteins and Peptides
Y. Qi1, M. Amirami1, W. Gao1, D. McCaffer1, and A. Chilkoti1
1 Duke University, Durham, NC, 2 Yale University, West Haven, CT, 3 Tsinghua University, Beijing, China, People’s Republic of

5:15PM
Encapsulation of an Imidazoquinoline TLR8 Agonist within Polymersomes Enhances Human Neonatal Dendritic Cell Activation
E. A. Scott1, D. Dowling1, A. Scheid1, I. Bergelson1, J. Ninkovic1, G. Sanchez-Schmitz1, O. Levy1, and J. Hubbell1
1 Ecole Polytechnique Federale de Lausanne (EPFL), Lausanne, Switzerland, 2 Boston Children’s Hospital & Harvard Medical School, Boston, MA
**Track: Biomechanics**

**OP - Thurs - 3 – 4 - Room 607**

**Cellular and Molecular Biomechanics III**

**Chairs:** Hayden Huang, Michael King

**4:00PM**

**Active Nanoscale Fluctuations in Cellular Mechanosensing**

S. Knoll¹, W. Ahmed², and T. Saif³

¹University of Illinois, Urbana, IL, ²Cite Institute, Paris, France, ³University of Illinois, Champaign, IL

**4:15PM**

**The Nanoscale Organization of Focal Adhesion Signaling Complexes Can Reflect Changes in Cellular Contractility and Motility**

M. G. Rubashkin¹, C. Dufort¹, P. Oakes², M. Paszek³, M. Davidson⁴, M. Gardel⁵, and V. Weaver¹

¹University of California, San Francisco, San Francisco, CA, ²University of Chicago, Chicago, IL, ³Cornell University, Ithaca, NY, ⁴Florida State University, Tallahassee, FL

**4:30PM**

**Knockout of Nesprin 1 and Desmin Causes Aberrant Nuclear Mechanics and Fibrosis in Skeletal Muscle**

M. A. Chapman¹, J. Zhang¹, J. Chen¹, and R. L. Lieber¹

¹University of California - San Diego, La Jolla, CA

**4:45PM**

**Role of Chromatin Structure in Large Strain High-Throughput Cell Deformability Measurements**

M. Masaeki¹, H. Tse¹, D. Gossett¹, and D. Di Carlo¹

¹University of California, Los Angeles, CA

**5:00PM**

**Elucidating Strain-Dependent Changes in FN Molecular Conformation Using Monodisperse Nanofibers**

J. M. Szymanski¹ and A. W. Feinberg¹

¹Carnegie Mellon University, Pittsburgh, PA

**5:15PM**

**Changes in Hydrogen Bonding of Hydration Water Induced By Contraction of Skeletal Muscle Myofibrils**

H. Yoo¹, E. Nagornjak¹, and G. Pollack¹

¹University of Washington, Seattle, WA

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**Track: Biomechanics**

**OP - Thurs - 3 – 5 - Room 608**

**Cardiovascular Biomechanics**

**Chairs:** Patrick Alford, Michael Sacks

**4:00PM**

**Cardiac Mechanics in Matrix Metalloproteinase-9 Null Mice Post-Myocardial Infarction**

A. P. Voorhees³, K. Y. De Leon⁴, J. Y. Ma⁴, G. V. Halade⁵, A. Yabluhanskiy⁶, M. L. Lindsey⁷, and H-C. Han⁸

³UTSA/UTHSCSA Joint Program in Biomedical Engineering, San Antonio, TX, ⁴San Antonio Cardiovascular Proteomics Center, San Antonio, TX, ⁵Jackson Center for Heart Research, University of Mississippi Medical Center, Jackson, MS, ⁶The University of Texas Health Science Center at San Antonio, San Antonio, TX, ⁷The University of Texas at San Antonio, San Antonio, TX

**4:15PM**

**Micromechanics of the Aortic Valve Leaflet Layers: Do They Slide or Not?**

R. M. Buchanan¹ and M. S. Sacks²

¹The University of Texas at Austin, Austin, TX

**4:30PM**

**Platelet Contractile Forces Can Be Transmitted Through a Non-Integrin Receptor, GP Ib-IX-V Complex as Revealed by E-beam Fabricated Nanoposts**

S. Feghhi¹, A. D. Munday³, W. W. Todley⁴, J. A. Lopez⁴, and N. J. Sniadecki⁴

¹University of Washington, Seattle, WA, ²Puget Sound Blood Center, Seattle, WA

**4:45PM**

**Flow Reversal Elicits a Pro-Arteriogenic CAM-1hi/KLF2hi Phenotype**

J. Heuslein¹, J. Meisner¹, H. Vincentelli¹, B. Blackman¹, and R. Price¹

¹University of Virginia, Charlottesville, VA

**5:00PM**

**Effect of Blast Wave on Cerebral Blood Pressure during Blast Exposure in a Rat Injury Model**

S. Assari¹, K. Laksari¹, M. F. Barbie¹, E. T. Choi¹, and K. Darvish¹

¹Temple University, Philadelphia, PA

**5:15PM**

**Hemodynamic Forces Control Ventricular and Valvular Growth Independent of Sidedness During Embryonic Development**

H. C. Yalcin¹, R. Gould², and J. Butcher²

¹Dogus University, Istanbul, Turkey, ²Cornell University, Ithaca, NY

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**Track: Cancer Technologies**

**OP - Thurs - 3 – 6 - Room 609**

**Imaging Strategies for Cancer Detection and Treatment**

**Chairs:** Jennifer Cochran, Joseph Matt Kinsella

**4:00PM**

**Colonial Tissue Topography as a Key Player of Metastasis – A Diagnostic Model**

S. Bharadwaj¹, R. Tran-Son-Tay¹, and S. Glover¹

¹University of Florida, Gainesville, FL

**4:15PM**

**Development of a Mechanically-Sensitive Antibody Against Fibronectin for Imaging of Fibrosis**

L. Cao¹, A. Suresh², S. Lees¹, and T. Barker¹

¹Georgia Institute of Technology, Atlanta, GA
4:30PM
Multiplexed Molecular Detection Using FLIM and Lifetime Probes
R. KOTA, M. RAHIM, C.-L. CHU, S. LEE, E. GRATTON, and J. B. HAUN
1University of California, Irvine, CA

4:45PM
An Engineered Peptide for Non-Invasive Optical Imaging of Brain Tumors
1Stanford University, Stanford, CA

5:00PM
Dual Transcript and Protein Quantification in a Massive Single Cell Array Toward Effective Cancer Therapy
1UC Berkeley, Berkeley, CA, 2Stanford University, Stanford, CA, 3David Geffen School of Medicine at UCLA, Los Angeles, CA
2University of Southern California, Los Angeles, CA
3University of California San Diego, San Diego, CA

5:15PM
Profile of Human Cells with a Portable Holographic Imaging System
H. IM, J. SONG, M. LIONG, L. FEXON, M. PIVOVAROV, R. WEISSLEIDER, and H. LEE
1Massachusetts General Hospital, Boston, MA, 2Harvard Medical School, Boston, MA

Track: Cardiovascular Engineering
OP - Thurs - 3 – 7 - Room 612
Hemodynamics and Cardiovascular Flow Modeling

Chairs: Alison Marsden, Michael Sacks

4:00PM
Impact of Blood Viscosity on Right-Ventricular Afterload during Hypoxic Pulmonary Hypertension
D. A. SCHREIER, T. HACKER, G. SONG, and N. CHESLER
1University of Wisconsin-Madison, Madison, WI

4:15PM
Contribution of Intraventricular Vortices to Left Ventricular Filling
1University of California San Diego, San Diego, CA, 2Hospital General Universitario Gregorio Marañón, Madrid, Spain
3Universidad Nacional de Educacion a Distancia, Madrid, Spain

4:30PM
Relative Area Change Is Inversely Related to Elastic Modulus of Proximal Coronary Arteries
1University of Wisconsin-Madison, Madison, WI

4:45PM
HIV-1 Proteins Induce Cathepsin Uregulation Under Physiological Shear Stress: Insights From HIV-transgenic Mice and Human Endothelial Cells
I. K. PARKER, R. GLEASON, R. SUTLIFF, and M. PLATT
1Georgia Institute of Technology, Atlanta, GA, 2Emory University, Atlanta, GA

5:00PM
Rotational Seeding and Flow Pre-conditioning for Improved Endothelialization of Vascular Allografts
J. S. UZARSKI and P. S. MCFRIDGE
1University of Florida, Gainesville, FL

5:15PM
Multiscale Modeling of Coronary Artery Hemodynamics in Kawasaki Disease
A. L. MARSDEN, D. SENGUPTA, A. KAHN, and J. BURNS
1University of California San Diego, La Jolla, CA

Track: Cellular and Molecular Bioengineering
OP - Thurs - 3 – 8 - Room 604
Mechanotransduction III

Chairs: Julie Ji, Michael Smith

4:00PM
Observing Force-Regulated Conformational Changes and Ligand Dissociation From a Single Integrin on Cells
W. CHEN, J. LOU, E. EVANS, and C. ZHU
1Georgia Institute of Technology, Atlanta, GA, 2Institute of Biophysics of Chinese Academy of Sciences, Beijing, China, 3People’s Republic of, 4Boston University, Boston, MA

4:15PM
Visualization of Chondrocyte Mechanotransduction in 3D
Q. WAN, E. CHOI, S. PARK, B. HAN, H. YOKOTA, and S. NA
1Purdue University, West Lafayette, IN, 2Indiana University-Purdue University Indianapolis, Indianapolis, IN

4:30PM
Shear Stress Modulates VCAM-1 Expression in Response to TNF and Dietary Lipids via IRF-I
J. S. DEVERSE, A. S. SANDHU, N. MENDOZA, C. M. EDWARDS, C. SUN, S. I. SIMON, and A. G. PASSERINI
1University of California, Davis, Davis, CA

4:45PM
Substrate Stiffness Modulates Cell Volume in 2D, But Not in 3D
M. ALI, S. PEDRONI, C. NEMEI, B. A. HARLEY, and T. A. SAIF
1University of Illinois at Urbana-Champaign, Urbana, IL

5:00PM
Parallel Magnetic Tweezers for Pulling CNS Axons towards a Source of Repellent Factors
1University College Dublin, Dublin, Ireland

5:15PM
Rho GTPases Control Nuclear Localization of Beta-Catenin and TCF/LEF Activity in Osteoblasts Under Flow
Q. WAN, E. CHOI, H. YOKOTA, and S. NA
1Purdue University, West Lafayette, IN, 2Indiana University-Purdue University Indianapolis, Indianapolis, IN

Track: Cellular and Molecular Bioengineering
OP - Thurs - 3 – 9 - Room 611
Cell Motility III

Chairs: Brenton Hoffman, Soichiro Yamada

4:00PM
Actin Cytoskeleton and Focal Adhesion Dynamics Regulate MMP-Independent Cancer Cell Migration in 3D Microtracks
C. M. KRANKING-RUSH, O. M. TORRE, and C. A. REINHART-KING
1Cornell University, Ithaca, NY
4:15PM
A Microfluidic Device to Measure Traction Forces During Confined Chemotactic Migration
C. D. PAUL1, P. S. RAMAN1, K. M. STROKA1, and K. KONSTANTOPOULOS1
1Johns Hopkins University, Baltimore, MD

4:30PM
Dorsal Adhesion Slows Glioblastoma Migration in Perivascular Mimics
A. D. RAPE1 and S. KUMAR1
1University of California - Berkeley, Berkeley, CA

4:45PM
Maintenance of Neuronal Polarity By a Microtubule Steering Mechanism Involving Kinesin and EBI
W. O. HANCOCK1 and Y. CHEN1,2
1Penn State University, University Park, PA, 2Huck Institutes for Life Sciences, University Park, PA

5:00PM
Large Scale Analysis of Mammalian Axon Growth and Guidance in Microfluidic Gradient Arrays
N. BHATTCHARJEE1 and A. FOLCH1
1University of Washington, Seattle, WA

5:15PM
Macrophage Chemokinesis and Force Generation on Microcontact Printed Surfaces
L. HIND1, D. COY1, and D. HAMMER1
1University of Pennsylvania, Philadelphia, PA, 2Albert Einstein University, Bronx, NY

Track: Device Technologies and Biomedical Robotics
OP - Thurs - 3 – 10 - Room 602

Biomedical Robotics
Chairs: Evin Gultepe, David Kaplan

4:00PM
Metabolic Strategies for Long-Term Survival of In Vitro Cultured Manduca Sexta Muscle
A. BARYSHYAN1, L. DOMIGAN1, E. PITCAIRN1, B. TRIMMER1, and D. KAPLAN2
1Tufts University, Medford, MA, 2Department of Biomedical Engineering, Medford, MA

4:15PM
Statistical Approach to Biopsy: Screening Large Area Organs with Untethered Surgical Tools
E. GULTEPE1, M. KHASHAB1, A. N. KALDOO1, F. M. SELARIU1, and D. H. GRACIAS1
1The Johns Hopkins University, Baltimore, MD

4:30PM
Development of a 3-D Skeletal Muscle Biological Actuator
C. CVETKOVIC1, V. CHAN1, R. RAMAN1, and R. BASHER1
1University of Illinois at Urbana-Champaign, Urbana, IL

4:45PM
Functional Three-Dimensional Insect Muscle Tissue for Bioactuation Applications
A. BARYSHYAN1, L. DOMIGAN1, B. TRIMMER1, and D. KAPLAN1
1Tufts University, Medford, MA

5:00PM
Portable Robotic Device for Autonomous Peripheral Venous Access using Near Infrared Image Guidance
A. CHEN1
1Rutgers University, Holmdel, NJ

5:15PM
Open Surgery Simulation with Multi-Level Force Feedback
S. LI1, G. SAUNDERS1, T. HALIC1, A. GALEA1, K. LEROY1, G. HIRSCHMAN1, and J. WEN1
1Rensselaer Polytechnic Institute, Troy, NY, 2University of Central Arkansas, Conway, AR, 3Virtec Inc., Waltham, MA

Track: Bioinformatics, Computational and Systems Biology
OP - Thurs - 3 – 11 - Room 615

Analysis and Control of Cell Signaling I
Chairs: Adam P. Arkin, Kevin A. Janes, H. Steven Wiley

4:00PM
Quantitative Understanding of Gene Expression for Systems and Synthetic Biology (Invited)
A. P. ARKIN1
1University of California Berkeley, Berkeley, CA, 2Lawrence Berkeley National Laboratory, Berkeley, CA

4:30PM
Linking Signal-Transduction and Gene-Expression Networks By Statistical Modeling (Invited)
Z. CHITGROUSHZADEH1, S. I. LARUS2, M. B. YAFFE3, D. A. LAUFFENBURGER2, P. K. SORGER2, R. C. FRY4, and K. A. JANES1
1University of Virginia, Charlottesville, VA, 2Massachusetts Institute of Technology, Cambridge, MA, 3Harvard Medical School, Boston, MA, 4University of North Carolina at Chapel Hill, Chapel Hill, NC

5:00PM
Differential EGFR Signaling From Autocrine Versus Paracrine Mode of Ligand Presentation (Invited)
B. E. LINDG1, W. J. QIAN1, W. CHRISSLER1, and H. S. WILEY1
1Pacific Northwest National Laboratory, Richland, WA

Track: Orthopaedic and Rehabilitation Engineering
OP - Thurs - 3 – 12 - Room 616

Musculoskeletal Tissue Engineering II - Scaffolds and ECM
Chairs: Johnna Temenoff, Lijie Grace Zhang

4:00PM
Engineering Dense Connective Tissues: Material, Mechanical, and Mechanobiologic Considerations (Invited)
R. L. MAUCK1
1University of Pennsylvania, Philadelphia, PA

4:30PM
Engineering Collagen Maturity and Density for the Knee Meniscus
P. HADIDI1, M. M. HIGASHIoka2, E. A. MAKRIS1, J. C. HU2, and K. A. ATHANASIOD1
1University of California, Davis, CA

4:45PM
Decellularized Cartilage as a Chondroinductive Material for Cartilage Tissue Engineering
A. N. RENTH1, G. L. CONVERSE1, R. J. HOPKINS1, and M. S. DETAMORE1
1University of Kansas, Lawrence, KS, 2Children’s Mercy Hospital, Kansas City, MO

5:00PM
Multi-Compartment Collagen-GAG Scaffolds to Guide MSC Differentiation for Osteotendinous Junction Repair
S. CALLAND1, D. WEISGERBER1, W. GRIER1, Z. MAHMADASSANI1, M. BOPPART1, and B. HARLEY1
1University of Illinois Urbana Champaign, Urbana, IL
5:15PM
Deletion of Scleraxis Impairs Supraspinatus Enthesis Development
M. L. Killian1 and S. Thomopoulos1
1Washington University School of Medicine, St. Louis, MO

Track: Biomedical Imaging and Optics
OP - Thurs - 3 – 13 - Room 618

Optical Coherence Tomography
Chairs: Christine P. Fleming

4:00PM
Study of Early Events in Murine Model of Colon Cancer Using Surface Magnifying Chromoendoscopy and Optical Coherence Tomography
M. R. Keenan1, S. Leung1, P. S. Rice1, R. A. Wall1, and J. K. Barton1
1The University of Arizona, Tucson, AZ

4:15PM
Quantitative Identification of Bright Spots in Intravascular Optical Coherence Tomography (IVOCT) Images of Human Coronary Arteries
J. E. Phipp3, D. Velai1, T. Hoyt2, D. Halaney5, J. J. Mancuso1, T. E. Milner1, and M. D. Feldman1
1University of Texas Health Science Center San Antonio, San Antonio, TX; 2Texas Heart Institute, Houston, TX; 3University of Texas at Austin, Austin, TX

4:30PM
Swept Source Optical Coherence Tomography Imaging of Temporal Bone for Use in a Robot-Assisted Surgical Guidance System for Cochlear Implant Surgery
S. Gurbani1, M. Zhao1, P. Wilkening1, B. Gonen1, G. Cheon1, I. Iordachita1, W. Chien1, R. Taylor1, J. Niparko1, and J. U. Kang1
1Johns Hopkins University, Baltimore, MD; 2University of Southern California, Los Angeles, CA

4:45PM
Cross-sectional Cornea Mechanical Properties Measurement by Dynamically Imaging Acoustic Waves with Phase Sensitive Optical Coherence Tomography
S. Song1,2, E. Wong1, T-M. Nguyen1, B. Arnal1, M. O’Donnell1, Z. Huang2, and R. Wang1
1University of Washington, Seattle, WA; 2University of Dundee, Dundee, United Kingdom

5:00PM
Quantification of 3D Fiber Orientation for Myocardial Tissues Using Optical Coherence Tomography
Y. Gan1 and C. P. Fleming1
1Columbia University, New York, NY

5:15PM
Optical Imaging and Spectroscopy of Tumor Bioenergetics In Vivo to Interpret Response to Therapy
N. Rajaram1, J. Zhong1, A. E. Freesi1, N. Ramnajan1, and M. W. Dewhirst1
1Duke University, Durham, NC

Track: Nanotechnology
OP - Thurs - 3 – 14 - Room 619

Human on Chip
Chairs: Brendan A. Harley, James Hickman

4:00PM
Engineered Human Hepatocyte-Encapsulated Microtissues for Predictive On-Chip Drug Metabolism
C. Y. Li1, A. G. Scheipers2, R. E. Schwartz2, B. S. Alejandrin2, and S. N. Bhatia1
1Massachusetts Institute of Technology, Cambridge, MA; 2Brigham and Women’s Hospital, Boston, MA

4:15PM
Glioma-On-A-Chip: Gradient Hydrogel Platform to Explore Extracellular Effects on Glioblastoma Malignancy
S. Pedroni1, E. Becka1, B. Mahad1, L. Skertich1, E. J. Roy1, and B. Harley1
1University of Illinois Urbana Champaign, Urbana, IL

4:30PM
Probing the Migratory Behavior of Patient-Derived Glioma Stem Cells on a Micro-Engineered Platform – A Single Cell Analysis
D. Gallego-Perez1, J. Ma1, P. Mao1, K. J. Kwak1, D. J. Hansford1, L. Nakano1, and L. J. Lee1
1The Ohio State University, Columbus, OH

4:45PM
Low Cost Microphysiological Systems with Analytics
J. J. Hickman1 and M. L. Shuler2
1University of Central Florida, Orlando, FL; 2Cornell University, Ithaca, NY

5:00PM
Disease-Specific Cardiac Tissue Models for Drug Discovery and Toxicology
A. Mathur1, P. Loskii1, B. Berg-Johansen1, N. Marks1, S. Hong1, L. Lee1, and K. Healy1
1University of California, Berkeley, CA

5:15PM
Blood-Brain Barrier on Chip, Drug Delivery Enhancement By Electroporation
M. Bonakdar1, P. A. Garcia1, and R. V. DaValos1
1Virginia Tech, Blacksburg, VA

Track: Drug Delivery
OP - Thurs - 3 – 15 - Room 620

Cancer Drug Delivery I
Chairs: Debra Augustine, Jordan Green

4:00PM
Selective Targeting and Treatment of Metastatic Pancreatic Cancer via Three Fusion Protein/Prodrug Systems
K. Passlack1, A. Restuccia1, C. Kurkjian1, and R. Harrison1
1University of Oklahoma, Norman, OK; 2University of Oklahoma Health Sciences Center, Oklahoma City, OK

4:15PM
In Vivo Non-viral Gene Delivery to Brain Tumor Stem Cells for Treatment of Glioblastoma
S. Y. Tseng1, H. Guerrerod-Cazares1, N. P. Young1, A. Quinones-Hinojosa1, and J. J. Green1
1University of Oklahoma, Norman, OK; 2Stanford University, Stanford, CA

4:30PM
Unnatural Killer Cells:TRAIL-coated Leukocytes that Kill Cancer Cells in the Circulation
M. J. Mitchell1, E. C. Wayne1, K. Rana1, C. Schaffer1, and M. R. King1
1Cornell University, Ithaca, NY

4:45PM
Combination Delivery of Doxorubicin and siRNA Using LBL Nanoparticles for Triple Negative Breast Cancer Treatment
J. Deng1, S. Morton1, and P. Hammond1
1MIT, Cambridge, MA

5:00PM
Sensitization of Circulating Tumor Cells to TRAIL-induced Apoptosis by Targeting ROS Signaling
J. Li1, C. Sharkey1, and M. King1
1Cornell University, Ithaca, NY
Brain-Penetrating Nanoparticles Improve Efficacy Against Gliosarcomas
E. NANCE1, C. ZHANG1, T. Y. SHIH1, and J. HANES1
1Johns Hopkins University, Baltimore, MD, 2Harvard University, Cambridge, MA

Track: Neural Engineering
OP - Thurs - 3 – 16 - Room 613

Neural Control and Modeling
Chairs: Dustin Tyler, Bruce Wheeler

Feed-Forward Information Propagation in Neuronal Assemblies From Defined In Vitro Cortical Networks
B. C. WHEELER1, S. ALAGAPAN1, L. PAN1, E. FRANCA1, G. J. BREWER2, and T. B. DEMARSE1
1University of Florida, Gainesville, FL, 2University of California Irvine, Irvine, CA

Transcranial Ultrasound for Noninvasive Targeted Modulation of Cortical Brain Circuits in Humans
J. MUELLER1, W. LEGON1, T. SATO1, A. ORIZ2, A. BARBOUR1, and W. TYLER1,2
1Virginia Tech School of Biomedical Engineering and Sciences, Blacksburg, VA, 2Virginia Tech Carilion Research Institute, Roanoke, VA

Restoring Sensation in Amputees with Nerve Cuff Electrodes
M. A. SCHIEFER1,2, D. TAN1,3, J. R. ANDERSON1,3, M. KIERTH4,5, and D. TYLER1,2
1Louis Stokes Cleveland Dept of Veterans Affairs Medical Center, Cleveland, OH, 2Case Western Reserve University, Cleveland, OH, 3University Hospitals, Cleveland, OH, 4MetroHealth Medical Center, Cleveland, OH

In Vivo and In Vitro Peripheral Nerve Stimulation via Electromagnetic Induction
Z. KAGAN1, V. RANKHAN1, F. KHAN1, G. LAZZI1, D. WARREN1, and R. NORMAN1
1University of Utah, Salt Lake City, UT

A Probabilistic Model Predicting Retinal Ganglion Cells Responses to Natural Images
N. IVEAN1 and N. M. GRZYWACZ2
1University of Southern California, Los Angeles, CA

Autonomic Function Assessment in Chronic Fatigue Syndrome Patients Using Kernel Method
A. K. KAMAL1,2
1Tennessee Tech University, Cookeville, TN, 2TTU, Cookeville, TN

Track: New Frontiers and Special Topics
OP - Thurs - 3 – 17 - Room 614

Smart Materials & Tissue Engineering
Chairs: Bahareh Behkam, Pat Stayton

Chemotactic Control of Live Autonomous Drug Delivery Agents (DrugBots) in a Hydrogel-Based Microfluidic Device
A. SAHARI1, M. A. TRAORE1, and B. BEHKAM1
1Virginia Tech, Blacksburg, VA

4:00PM
TRAIL Mediated Apoptosis in the Third Dimension
S. CHANDRASEKARAN1, J. R. MARSHALL1, and M. R. KING1
1Cornell University, Ithaca, NY

Biomimetic Stem Cell Modified Tissue Engineered Nanostructured In Vitro Bone Model for Breast Cancer Bone Metastasis Study
M. WANG1, S. FU1, and L. ZHANG1
1The George Washington University, Washington, DC

Stimuli-Responsive Binary Reagent Systems for Enabling Rapid and Effective Immunoaffinity Separation
J. J. LAI1, J. A. NEHILLA1, T. H. SCHULTE2, and P. S. STAYTON1
1University of Washington, Seattle, WA, 2Nexgenia, Inc., Seattle, WA

Red Blood Cell Manipulation Using Ultrasound Microbeam
K. LAM1, Y. LI1, Q. ZHOU1, and K. SHUONG1
1University of Southern California, Los Angeles, CA

Toxin Detection Using Organic Electrochemical Transistors Integrated with Living Cells
S. A. TRIA1, M. RAMUZ1, L. H. JIMISON1, P. LELEUX1, A. HAM1, G. G. MALLARAS1, and R. M. OWENS1
1Ecole des Mines de Saint Etienne, Centre de Microélectronique de Provence, Gardanne, France, 2NIST, Gaithersburg, MD

Track: Translational Biomedical Engineering
OP - Thurs - 3 – 18 - Room 61A

Therapeutic and Diagnostic Biomedical Devices
Chairs: Rafael Davalos, Buddy Ratner

Microwell Arrays: From Genetic Analysis to Ultra-high Sensitivity Analysis
D. R. WALT1
1Tufts University, Medford, MA

A Dielectrophoretic Filter To Isolate Bacteria From Large Volumes At High Processing Rates
L. D’AMICO1,2, J. A. ADACHI1, and P. R. GASCOYNE2
1University of Texas at Austin, Austin, TX, 2University of Texas MD Anderson Cancer Center, Houston, TX

Stabilization and Delivery of Vaccines with Silk Microneedles
W. RAJA1, B. PANILAITIS1, I. DIWAN1, and D. KAPLAN1
1Tufts University, Medford, MA

Nano-BaSO4 in Pellethane Creates Radiopaque Thermoplastics That Are Less Prone To Bio-fouling
G. E. ANIWENE11, D. STOUT1, Z. YAN1, Z. YAN1, and T. J. WEBSTER1
1Northeastern University, Boston, MA, 2Brown University, Providence, RI

Development of a Simple and Self-Contained mRNA Biomarker Extraction and Detection Assay
N. M. ADAMS1, A. WANG1, D. GVARJALADZE2, L. LOMIDZE2, B. I. KANKIA2, D. W. WRIGHT1, and F. H. HASLETON1
1Vanderbilt University, Nashville, TN, 2Ohio State University, Columbus, OH
FRIDAY, September 27
TODAY'S HIGHLIGHT

**PLATFORM SESSIONS Fri-1**
See pages 115-121, WSCC

8:00am - 9:30am

**EXHIBIT HALL OPEN**
WSCC, Exhibit Hall 4AB

9:30am - 5:00pm

**POSTER SESSION Fri A**
WSCC, Exhibit Hall 4AB

9:30am - 1:00pm

Poster Viewing with Authors & Refreshment Break

9:30am - 10:30am

**PLENARY SESSION**
10:30am - 12:00noon
WSCC, Ballroom 6E

Distinguished Achievement
Sue Van

NIH NIBIB Lecture
W. Mark Saltzman, PhD

**WOMEN IN BME Luncheon**
WSCC, Ballroom 6A

12:15pm - 1:15pm

**CAREER FAIR**
WSCC, South Lobby

1:00pm - 5:00pm

**PLATFORM SESSIONS Fri-2**
See pages 152-156, WSCC

1:30pm - 2:30pm

**POSTER SESSION Fri A**
Exhibit Hall 4AB

9:30am - 1:00pm

Poster Viewing with Authors & Refreshment Break

3:45pm - 4:45pm

**PLATFORM SESSION Fri-3**
See pages 157-160, WSCC

2:45pm - 3:45pm

**PLENARY SESSION**
4:45pm - 6:00pm
TECHNO-STORIES FROM SPACE
Donald Pettit, PhD

**BMES BASH**
EMP Museum

7:00pm - 10:00pm

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**Friday, September 27, 2013**

8:00AM – 9:30AM

**PLATFORM SESSIONS –FRI –1**

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**Track: Tissue Engineering**

**OP - Fri - 1 - 1 - Room 6B**

**Tissue Engineered Models for Study of Disease and Drug Discovery I**

**Chairs:** Kara McCloskey, Abby R. Whittington

8:00AM

Bioengineered Human Trabecular Meshwork Mimicking In Vivo-like Outflow Response

K. Y. Torrejon1, M. Bergkvist1, J. Danias2, S. Sharfstein3, and Y. Xie1

1SUNY at Albany-College of Nanoscale Science and Engineering, Albany, NY, 2SUNY Downstate Medical Center, Brooklyn, NY

8:15AM

3D In Vitro Model of Vascularized Cardiac Tissue for Cardiac Drug Screening

D. D. Tran1, M. L. Moya1, L. F. Alonzo1, and S. C. George1,2

1University of California, Irvine, Irvine, CA, 2The Edwards Lifesciences Center for Advanced Cardiovascular Technology, Irvine, CA

8:30AM

Mechanical Loading Inhibits Metastasis-mediated Osteolysis via Effects on Osteoclasts

M. E. Lynch1, M. J. Lee1, P. V. Polamraju1, L. Bonassar1, and C. Fischbach1

1Cornell University, Ithaca, NY

8:45AM

Effects of TGF-beta stimulation on In Vitro vasculogenesis models

L. F. Alonzo1, A. L. Crampton1, M. L. Moya1, and S. C. George1,2

1University of California Irvine, Irvine, CA, 2The Edwards Lifesciences Center for Advanced Cardiovascular Technology, Irvine, CA

9:00AM

Hypoxia Promotes Liver-Stage Malaria Infection in Primary Human Hepatocytes In Vitro

S. NG1, S. March1, A. Galtian1, M. M. Mota1, and S. Bhatia1

1Massachusetts Institute of Technology, Cambridge, MA, 2Instituto de Medicina Molecular, Universidade de Lisboa, Lisbon, Portugal

9:15AM

3D Adipose Tissue Model for Type 2 Diabetes Mellitus

K. A. Burke1, R. D. Abbott1, and D. L. Kaplan1

1Tufts University, Medford, MA

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**Track: Biomaterials**

**OP - Fri - 1 - 2 - Room 6C**

**Micro and Nanostructured Materials IV**

**Chairs:** Jordan Green, Mehdi Nikkhah

8:00AM

Tunable Peptoid Microsphere Coatings

S. Servoss1, M. Hébert1, D. Shah1, P. Blaké1, and J. P. Turner1

1University of Arkansas, Fayetteville, AR

8:15AM

Nano composites Improved Magnesium Degradation Properties for Biomedical Implants

I. Johnson1 and H. Liu1

1University of California at Riverside, Riverside, CA
8:30AM  Biomimetic Peptide Coating on Bioresorbable Magnesium Metal
A. J. Patil1, E. Beniash1, and C. Speir1
1University of Pittsburgh, Pittsburgh, PA

8:45AM  Bifunctional Janus Microparticles with Spatially Segregated Proteins
T. Sulchek1, J. Tang1, K. Schoenwald1, D. Potter1, and D. White2
1Georgia Tech, Atlanta, GA, 2USDA, Ames, IA

9:00AM  Forming of Janus Particle Surface By Adsorption
D. Gai1, H. Tan1, S. Zhang1, Y. Lu1, and J. K. Hsi1
1University of Illinois at Urbana-Champaign, Urbana, IL, 2Pennsylvania State University, University Park, PA

9:15AM  Spatially Defined Reconfigurable Topography for Tracking Filopodia Dynamics
P. Pholpobu1, H. Wu1, and C. A. Bettinger1
1Carnegie Mellon University, Pittsburgh, PA

Track: Biomaterials
OP - Fri - 1 – 3 - Room 606

Therapeutic Biomaterials II

Chairs: Daniel Benoit, Jason Burdick

8:00AM  Modulation of Macrophage Sphingolipid Metabolites via Intracellular Drug Delivery for Inflammatory Regulation
C. E. Segar1 and E. Botchwey1
1Georgia Institute of Technology and Emory University, Atlanta, GA

8:15AM  Dynamic Biomaterials for Healing Chronic Wounds
B. D. Almqvist1 and P. T. Hammond1
1Massachusetts Institute of Technology, Cambridge, MA

8:30AM  pH-Responsive Micelles for the Targeted Delivery of Chemotherapeutic Drugs
A. J. Convertine1, P. Stayton1, G. Y. Bergug1, M. J. Manganiello1, B. Ghosh1, and J. T. Wilson1
1University of Washington, Seattle, WA

8:45AM  Non-Viral Gene Carriers for Retinal Therapies
S. Merritt1 and H. Von Recum1
1Case Western Reserve University, Cleveland, OH

9:00AM  Peptide-functionalized Scaffolds Regulating Angiogenesis and Inflammation in Peripheral Artery Disease
A. L. Zachman1, J. Tucker-Schwart2, F-W. Shen1, S. T. Fitzpatrick1, M. Skala1, and H-J. Sung1
1Vanderbilt University, Nashville, TN

9:15AM  Polypeptide-Gold Nanorod Solders for Laser Tissue Welding
J. Ramos1, H-C. Huang1, K. Pushpawanam1, J. Faust1, and K. Rege1
1Arizona State University, Tempe, AZ, 2Massachusetts General Hospital and Harvard Medical School, Boston, MA

Track: Biomechanics
OP - Fri - 1 – 4 - Room 607

Cellular and Molecular Biomechanics IV

Chairs: Adam Feinberg, Shyni Varghese

8:00AM  Traction Stress as a Modulator for Protease Dependent Invasion of Cancer Cells
A. Aung1, Y. N. Se01, C. Janora1, J. Del Alamo1, and S. Varghese1
1University of California, San Diego, La Jolla, CA

8:15AM  Dynamic Regulation of Cellular Mechanics During Lung Cancer Metastasis
L. I. Volakis1, N. Higuita-Castro1, and S. N. Ghadiali2,3
1The Ohio State University, Columbus, OH, 2The Wexner Medical Center at the Ohio State University, Columbus, OH

8:30AM  ECM Alignment Polarizes Focal Adhesions and Directs Cell Migration
B. M. Baker1 and C. S. Chen1
1University of Pennsylvania, Philadelphia, PA

8:45AM  Physical Mechanism for Lung Branching Morphogenesis Revealed by 3D Traction Force Microscopy
V. D. Varner1, J. P. Gleghorn1, and C. M. Nelson2
1Princeton University, Princeton, NJ

9:00AM  Vascular Alignment is Determined by the Deformation of the ECM in Response to Active Forces Generated by Neovessel Sprouts
L. T. Edgar1, S. A. Maas1, J. E. Guilkey1, and J. A. Weiss1
1University of Utah, Salt Lake City, UT

9:15AM  Microfabricated Substrates Co-encoding Large Spatial Stiffness Gradients and Cell Patterns for Investigating Cell and Tissue Polarity
P. Tseng1 and D. Di Carlo1
1University of California, Los Angeles, Los Angeles, CA

Track: Tissue Engineering
OP - Fri - 1 – 5 - Room 608

Musculoskeletal and Orthopaedic Tissue Engineering I

Chairs: Michael Detamore, Mariah Hahn

8:00AM  The Vulnerability and Protection of Human MSC Against Apoptosis Is Dependent on Differentiation State
B. Y. Binder1, D. C. Genetos1, and J. K. Leach1
1University of California Davis, Davis, CA

8:15AM  Polycaprolactone Fumarate as a Novel Biomaterial for Soft Tissue Engineering
S. C. Chase1, E. Wagner1, D. Bravo1, M. Dadsetan1, S. Kakar1, and WM. Yaszemski1
1Mayo Clinic, Rochester, MN
Critical Seeding Density Enhances Scaffold-Free Engineered Meniscus
Hadi, P. 1, T. C. Yeh, D. J. Huey, J. C. Hu, and K. A. Athanasiou
1University of California, Davis, CA

Gene Expression-Based Enrichment of Human Adipose-Derived Stem Cells for Enhanced Osteogenic Differentiation
Desai, H. V. 1 and M. E. Darling
1Brown University, Providence, RI

Biomechanical Evaluation of Suture Holding Properties of Native and Engineered Articular Cartilage
DuRaine, G. 1, Arizzi, B., Lee, J., Lee, C., Respondek, D., Hu, J., and Athanasiou, K.
1University of California Davis, Davis, CA, 2University of California Davis Medical Center, Sacramento, CA

Mechanical Control of Collagen Organization and Anisotropy in Tissue Engineered Menisci
Puetzer, J. L. 1 and Bonassar, L.
1Cornell University, Ithaca, NY

Bioengineering Models of Cancer I

In Vitro Model for Tumor Cell Extravasation to Bone
1MIT, Cambridge, MA, 2Politecnico di Milano, Milan, Italy, 3Gruppo Ospedaliero San Donato Foundation, Milan, Italy, 4Korea University, Seoul, Korea, Republic of, 5Draper Laboratory, Cambridge, MA

Recapitulating Ewing’s Sarcoma Signature in Tumor Cell Lines By An Engineered Bone Microenvironment
Villasante, A., Marturano, A., Yee, F. Y., and Vunjak-Novakovic, G.
1Columbia University, New York, NY, 2Politecnico di Milano, Milan, Italy

Receptor Tyrosine Kinase Inhibitor Efficacy in Carcinoma is Stiffness Dependent
Nguyen, T., Herrick, M., Sleiman, M., Moriarty, T., and Peyton, S.
1University of Massachusetts, Amherst, Amherst, MA

Micropatterned Tumor-Stromal Assay for Cancer Drug Discovery
1Center for Engineering in Medicine, MGH/HMS, Boston, MA, 2Center for Cancer Research, MGH, Boston, MA, 3Massachusetts Institute of Technology, Cambridge, MA

Characterization of Tumor Heterogeneity Using Bioimage Informatics and 3D Computational Modeling
1Johns Hopkins University, School of Medicine, Baltimore, MD, 2Katholieke Universiteit Leuven, Heverlee, Belgium

Tumor-Microenvironment-On-Chip: Simulation of Complex Transport Around Tumor
Kwak, B., Shin, K., Park, B., and Han, B.
1Purdue University, West Lafayette, IN

Tumor-Microenvironment-On-Chip: Simulation of Complex Transport Around Tumor
Kwak, B., Shin, K., Park, B., and Han, B.
1Purdue University, West Lafayette, IN

Track: Cardiovascular Engineering
OP - Fri - 1 – 7 - Room 612
Heart Valves
Chairs: Michael Sacks, Craig Simmons

Non-Glutaraldehyde Extracellular Matrix Stabilization in Porcine Aortic Heart Valves
Tam, W., Zhang, M., Sacks, N., and Vyawahare, N.
1Clemson University, Clemson, SC, 2The University of Texas at Austin, Austin, TX

The Spatiotemporal Evolution of Mineral Deposition and Maturation During Aortic Valve Leaflet Calcification
Richards, J., Miller, L., Estroff, A., Boskey, A., and Butter, J.
1Cornell University, Ithaca, NY

Isolated Effect of Geometry on Mitral Valve Function for In-Silico Model Development
Touichten, S. A., Sievert, A. W., Herrmann, T. A., Rabbah, M., Sakkirshnan, N., Kushnerman, K. S., and Yoganathan, A.
1Georgia Institute of Technology, Atlanta, GA, 2University of Maine, Orono, ME

A Micro-Anatomically Accurate Finite Element Model for Investigation of Functioning Mitral Valve and Its Relationship to Interstitial Cell Deformations
Lee, J. H., Gorman, R. C., Gorman, R., Ammar, M., and Sacks, N.
1The University of Texas at Austin, Austin, TX, 2University of Pennsylvania, Philadelphia, PA, 3University of Pittsburgh, Pittsburgh, PA

Fluid-Structure Interaction with Adaptive Fluid Mesh for Large Deflections in a Trileaflet Valve
Claiborne, T. E., Horner, S., Prabhakar, G., Verma, M., Sleiman, M., and Bluestein, D.
1Stony Brook University, Stony Brook, NY, 2Ansys, Inc., Evanston, IL, 3Ansys Fluent India Pvt. Ltd., Pune, India, 4University of Arizona, Tucson, AZ

The Effects of Transcatheter Aortic Valve Placement and Sizing on Geometric Orifice Area and Leaflet Curvature
Stearns, G. M., Sakkirshnan, N., Sievert, A. W., and Yoganathan, A.
1Georgia Institute of Technology & Emory University, Atlanta, GA

Track: Cancer Technologies
OP - Fri - 1 – 6 - Room 609

Isolated Effect of Geometry on Mitral Valve Function for In-Silico Model Development
Touichten, S. A., Sievert, A. W., Herrmann, T. A., Rabbah, M., Sakkirshnan, N., Kushnerman, K. S., and Yoganathan, A.
1Georgia Institute of Technology, Atlanta, GA, 2University of Maine, Orono, ME

A Micro-Anatomically Accurate Finite Element Model for Investigation of Functioning Mitral Valve and Its Relationship to Interstitial Cell Deformations
Lee, J. H., Gorman, R. C., Gorman, R., Ammar, M., and Sacks, N.
1The University of Texas at Austin, Austin, TX, 2University of Pennsylvania, Philadelphia, PA, 3University of Pittsburgh, Pittsburgh, PA

Fluid-Structure Interaction with Adaptive Fluid Mesh for Large Deflections in a Trileaflet Valve
Claiborne, T. E., Horner, S., Prabhakar, G., Verma, M., Sleiman, M., and Bluestein, D.
1Stony Brook University, Stony Brook, NY, 2Ansys, Inc., Evanston, IL, 3Ansys Fluent India Pvt. Ltd., Pune, India, 4University of Arizona, Tucson, AZ

The Effects of Transcatheter Aortic Valve Placement and Sizing on Geometric Orifice Area and Leaflet Curvature
Stearns, G. M., Sakkirshnan, N., Sievert, A. W., and Yoganathan, A.
1Georgia Institute of Technology & Emory University, Atlanta, GA

Track: Cellular and Molecular Bioengineering
OP - Fri - 1 – 8 - Room 604
Cell Adhesion I
Chairs: Allen Liu, Fan Yang

Visualizing Mechanical Tension Changes By Alpha-Catenin at Cadherin Adhesions
1Neuroscience Program, University of Illinois at Urbana-Champaign, Urbana, IL, 2Department of Bioengineering, University of Illinois at Urbana-Champaign, Urbana, IL, 3Department of Chemistry and Chemical Engineering, University of Illinois at Urbana-Champaign, Urbana, IL
8:15AM Phenotypic Analysis of Inflammatory Monocytes for Predicting the Onset of Atherosclerosis Using a Microfluidic Chip
G. A. FOSTER1, R. M. GOWER2, E. J. ARMSTRONG2, and S. I. SIMON1
1University of California Davis, Davis, CA; 2Northwestern University, Chicago, IL

8:30AM Evaluation of the Endothelial Glycocalyx as a Barrier to Leukocyte Adhesion
G. MARSH1 and R. E. WAUGH1
1University of Rochester, Rochester, NY

8:45AM Cell-Matrix Interactions Dominate the Self-Organization of Human Mammary Epithelial Cells
A. CERCHIARI1, J. GARBIE2, M. THOMSON2, M. TODHUNTER2, N. JEE2, M. LABARGE2, T. DESAI1, and Z. GARTNER1
1UC Berkeley - UCSF, San Francisco, CA; 2Lawrence Berkeley National Laboratory, Berkeley, CA; 3UCSF, San Francisco, CA

9:00AM Oxidized Low-Density Lipoprotein Increases a Risk of Atherogenesis via Coagulation of Macrophages and Mast Cells
C. CHEN1 and D. KHSIEMATULLIN1
1Tulane University, New Orleans, LA

9:15AM Terminal Sterilization of a Decellularized Cartilage Scaffold Affects Cell Viability and Adhesion
A. MATUSKA1 and P. MCFETRIDGE1
1University of Florida, Gainesville, FL

Track: Stem Cell Engineering
OP - Fri - 1 - 9 - Room 611

Engineering Stem Cell Niche
Chairs: Guohao Dai, Warren Grayson

8:00AM Directing Stem Cell Fate in 3D Through Cell Interface Engineering
P. VISWANATHAN1, S. CHIRASATITTISIN2, G. BATTAGLIA1, and A. J. ENGLER2
1University College London, London, United Kingdom; 2UC San Diego, La Jolla, CA

8:15AM Directing Mesenchymal Stem Cell Fate Decisions By Engineering Cell-Cell Adhesion Pathways
S. ALIMPERT1, S. ROW1, S. AGARWAL2, and S. ANDRASIS2
1SUNY at Buffalo, Buffalo, NY; 2Baylor College of Medicine, Houston, TX

8:30AM Paracrine Interactions Between Normoxic and Hypoxic Stem Cells in a Microfluidic Oxygen Landscape Alter VEGF Transcription
M. L. REXIUS1, J. REHMAN1, A. B. MALI1, and D. T. EDDINGTON1
1University of Illinois at Chicago, Chicago, IL

8:45AM Engineering 3D Cardiospheres from Human Pluripotent Stem Cells
T. HOOKWAY1, D. NGUYEN2, C. XU2, and T. MCDIETTI1
1Georgia Institute of Technology, Atlanta, GA; 2Emory University, Atlanta, GA

9:00AM Stem Cell-Derived Microvascular Networks in a Synthetic Matrix
S. KUSUMA1, Y. I. SHEN1, D. HANAYA-PUTRA1, P. MALI1, L. CHENG1, and S. GRECHT1
1Johns Hopkins University, Baltimore, MD

9:15AM Combinatorial Fibronec tin and Laminin Signaling Promotes Highly Efficient Cardiac Differentiation of Human Embryonic Stem Cells through Integrin/FAK/ERK Signaling
S. SA1 and K. E. MCCLOSKEY1
1University of California, Merced, Merced, CA

Track: Device Technologies and Biomedical Robotics
OP - Fri - 1 - 10 - Room 602

Stents
Chairs: Rita Alevriadou, Robert Peattie

8:00AM Point-of-Care Seeding of Nitinol Stents with Blood-Derived Endothelial Cells
A. E. JANTZEN1, H. E. ACHECK2, and G. A. TRUSKEY3
1Duke University, Durham, NC; 2Duke University Medical Center, Durham, NC

8:15AM A Novel Biodegradable Stent Coating for Drug Release in Congenital Heart Disease Applications
A. C. GOODFRIEND4, G. BARKER4, T. R. WELCH4, R. GINTHER5, M. REAGEL6, S. REDDY7, J. WANG4, A. NUGENT8, and J. FORBES9
4University of Texas Southwestern Medical Center, Dallas, TX

8:30AM Mitigation of Flow Separation Improves Procoagulant Milieu in an In Vitro Stent Model
J. M. JMÉNEZ1, C. KAMPMEYER1, M. YU1, I. H. JOHNSTON1, and P. F. DAVIES3
1University of Pennsylvania, Philadelphia, PA

8:45AM Design of a Flexible Balloon-Expandable Peripheral Stent Using Finite Element Analysis
K. SHANMUGAM1, R. RAMANATHAN1, J. RAJAN1, G. JOSEPH9, and M. THANIKACHALAM1
1Agada Medical Technologies, Chennai, India; 2Christian Medical College, Vellore, India; 3OSU, Columbus, OH

9:00AM Magnetic Capture of Endothelial Cells to Vascular Stents
B. J. TEFIT1, S. LISHAMMA1, J. H. HARSHUN2, M. KLUBUSAY3, G. HUJNOMAZ4, D. R. HOLMES1, R. D. SIMAR1, D. DRAGOMIR-DAESCU5, and G. S. SANDHU6
1Mayo Clinic, Rochester, MN; 2Duke University, Stockton, United Kingdom; 3St. Anne’s University Hospital, Brno, Czech Republic

9:15AM Titania Nanotube Formation on Cardiovascular Stents
H. NUNH1
1UCSF Mission Bay Campus, San Francisco, CA

Track: Bioinformatics, Computational and Systems Biology
OP - Fri - 1 - 11 - Room 615

Modeling in Personalized Medicine
Chairs: Andrea H. Bild, Mark R. Chance, Adam A. Margolin

8:00AM Genomics-based discovery of novel drug regimens effective in RAS-driven tumors (Invited)
A. BILD1
1University of Utah, Salt lake city, UT
8:30AM
Network Biology and Personalized Medicine in Multiple Sclerosis
(Invited)
R. NIBBLE1, Y. LIU2, M. KOYTURK1, AND M. CHANCE3.
1NeoProteomics, Inc., Cleveland, OH; 2Case Western Reserve U, Cleveland, OH

9:00AM
Computational Models and Crowd-Sourcing Initiatives for Inferring Genetic Predictors of Cancer Phenotypes. (Invited)
A. A. MARGOLIN
1Sage Bionetworks, Seattle, WA

Track: Respiratory Bioengineering
OP - Fri - I – 12 - Room 616
Lung Development and Regeneration: Bioengineering and Mechanotransduction
Chairs: Deborah Leckband, Dan Tschumperlin
8:00AM
Overview Talk - Respiratory Bioengineering
S. S. MARGULIES
1University of Pennsylvania, Philadelphia, PA

8:15AM
Mechanotransduction in Lung Endothelium
D. LECKBAND1, A. BARRY2, S. DUDEN3, J. G. GARCIA4, AND N. WANG5
1University of Illinois, Urbana, IL; 2University of Illinois College of Medicine, Chicago, IL

8:30AM
Evaluation of In Vitro Tissue Models of Upper and Lower Airway
A. MAHMOOD1, J. DYER2, E. MISHKIN3, AND W. WARREN
1Sanofi Pasteur, Orlando, FL; 2US Army Medical Institute for Infectious Diseases, Fort Detrick, Frederick, MD

8:45AM
Decellularization and Recellularization of Human Lungs: A Model for Ex-Vivo Lung Bioengineering and Transplantation
1University of Vermont, Burlington, VT; 2University of Cagliari, Cagliari, Italy

9:00AM
Design and Synthesis of an Adherent Artificial Pulmonary Pleura
D. E. WAGNER1, S. L. FENN2, N. R. BONENFANTI3, R. OLDINSKI4, AND D. J. WEISS
1University of Vermont, Burlington, VT

8:5AM
Shaping The Airway Epithelium During Branching Morphogenesis Of The Lung: A Role For Stereotyped Smooth Muscle Differentiation
H. Y. KIM1, E. MILLER2, D. C. RADISKY3, AND C. M. NELSON
1Princeton University, Princeton, NJ; 2Mayo Clinic Cancer Center, Jacksonville

Track: Biomedical Imaging and Optics
OP - Fri - I – 13 - Room 618
Ultrasound
Chairs: Elisa Konofagou
8:00AM
Integrated Optical/Ultrasound Multimodality Intravascular Imaging for Assessing Vulnerable Plaques
M. GUDUR1, R. R. RAID2, A. W. PETERSON1, D. J. CALDWELL3, C. X. DENG3, AND J. P. STEGEMANN1
1University of Southern California, Los Angeles, CA; 2University of California Irvine, Irvine, CA

8:15AM
Noninvasive, Quantitative Monitoring of In Vitro Osteoblastic Differentiation in 3D Engineered Tissues using Spectral Ultrasound Imaging
K. TIMBIE1, G. W. MILLER1, N. R. NANCE2, J. SON2, C. Zhang3, C. Hans4, AND R. J. PRICE1
1University of Virginia, Charlottesville, VA; 2Johns Hopkins University, Baltimore, MD

8:30AM
Controlling Nanoparticle Delivery Across the Blood-Brain Barrier Using MR Guided Focused Ultrasound
R. HARTMAN1, S. KAZMI2, A. SALIAGGIO2, C. SCHRAUDT2, C. SULLENDER1, C. SULLENDER3, S. EMELIANOV4, AND A. DUNN1
1University of Texas at Austin, Austin, TX

8:45AM
Delivery of Oxygen-Sensitive Two-Photon Contrast Agent to the Mouse Brain via Blood Brain Barrier Disruption Using Ultrasound and Microbubbles.
R. HARTMAN1, S. KAZMI2, A. SALIAGGIO2, C. SCHRAUDT2, C. SULLENDER1, C. SULLENDER3, S. EMELIANOV4, AND A. DUNN1
1University of Texas at Austin, Austin, TX

9:00AM
Nucleation Site Formation During Acoustic Droplet Vaporization
D. S. LI1, J. B. FOLKES2, AND J. L. BULL1
1University of Michigan, Ann Arbor, MI

9:15AM
Characterization of Optically Induced Microbubble Oscillations
J. DOVE1, M. BORDEN1, AND T. MURRAY1
1University of Colorado at Boulder, Boulder, CO

Track: Nano to Micro Technologies
OP - Fri - I – 14 - Room 619
Nanobiointerfaces I
Chairs: Andrew Tsourkas, Deok-Ho Kim
8:00AM
Microscale Tissue Engineering and Biomarker Analysis Using Aqueous Two-Phase System Droplet Microfluidic Systems
J. FRAMPTON1 AND S. TAKAHAMA1
1University of Michigan, Ann Arbor, MI

8:15AM
Site-Specific and Covalent Conjugation of IgG using a Recombinantly Expressed Protein A Domain Incorporating a Photoactive Amino Acid
J. HU1 AND A. TSOURKAS1
1University of Pennsylvania, Philadelphia, PA
8:30 AM
Local Thermal Effects on the Surface of Magnetic Nanoparticles
L. Polo-Corráles1 and C. Rinaldi1
1University of Puerto Rico, Mayagüez, Mayagüez, PR; 2University of Florida, Gainesville, FL

8:45 AM
Controlled Rupture of Drug-Encapsulated Ultrasound Contrast Agents in Blood Vessels on a Chip
Y. Park1, T. Pham2, S. Kim3, J. Kim4, W. Park3, R. O. Clevelander5, N. Jeon6, J. O. Nagy6, and J. Y. Wong1
1Boston University, Boston, MA; 2Seoul National University, Seoul, Korea, Republic of; 3University of Oxford, Oxford, United Kingdom; 4Novovant Pharmaceuticals, Bozeman, MT

9:00 AM
Alpha-Helical Peptide-Induced Vesicle Fusion to Form Complex Supported Lipid Bilayers for Biosensing Applications
G. Hardy7, R. Navar7, and S. Zauscher7
7Duke University, Durham, NC

9:15 AM
Universal Platform for On-Demand Preparation of Antibody-Functionalized Quantum Dots
P. Zhuzhevsky and X. Gao7
7University of Washington, Seattle, WA

Track: Drug Delivery
OP - Fri - I – 15 - Room 620

Cancer Drug Delivery II
Chairs: Angela Pannier, Tatiana Segura

8:00 AM
Drug Eluting Stent for the Treatment of Pancreatic Cancer
L. Indolfi1, M. Liegdon2, D. Ting2, C. Ferrone2, J. Clark3, R. Langer4, and E. Edelman1
1MIT, Cambridge, MA; 2MGH, Cambridge, MA

8:15 AM
Engineered Probiotics for Urinary Detection of Cancer Metastases
T. Danino1, A. Priore2, G. Kwon3, M. Skalak4, J. Hasty5, and S. Bhata6
1MIT, Cambridge, MA; 2UCSD, La Jolla, CA

8:30 AM
Intratumoral Depot of TNF-alpha-ELP Fusion Protein for Local Cancer Therapy
J. Park1, W. Liu2, and A. Chilkoti1
1Duke University, Durham, NC

8:45 AM
Polymer Nanoparticles for Delivery of Multiple Therapeutic Agents and Their Effect on Cancer Cell Growth
A. Edirimake2, J. Zhou3, and M. Saltzman1
1Yale University, New Haven, CT

9:00 AM
Genetically Encoded Polypeptide Nano-Micelle for Paclitaxel Delivery to Triple Negative Breast Tumor
J. Bhattacharyya1, J. R. McDaniel2, and A. Chilkoti1
1Duke University, Durham, NC

9:15 AM
Mesothelin-targeted Nanoparticles for the Effective Use of Gemcitabine against Pancreatic Cancer
J. Pollet1, E. Poyet1, Z. Liu2, B. Zhai3, Q. C. Yao1, and M. Heffernan4
1Baylor College of Medicine, Houston, TX
8:30AM
Electrical Dosimetry for Potential Driven Electromechanical Reshaping of Cartilage
D. PROTSENKO1 and B. WONG2
1University of California Irvine, Irvine, CA, 2Beckman Laser Institute, Irvine, CA

8:45AM
Multicycle Quantum Dot Staining for Comprehensive Single-Cell Molecular Characterization
P. ZRAZHEVSKY1 AND X. GAO1
1University of Washington, Seattle, WA

9:00AM
Co-Regulation of Follow-The-Leader Invasion by Proteolysis and Extracellular Matrix Microarchitecture
S. P. CAREY1, A. STARCHEIKO1, A. L. McGREGOR1, and C. A. REINHART-KING1
1Cornell University, Ithaca, NY

9:15AM
Automatic Optical Tweezers Based Active Microrheology (AMR)
M. KEATING1, M. B. ALVAREZ-ELZONDO1, A. KURUP1, and E. BOTVINICK1
1University of at Irvine, Irvine, CA

Whitaker International Program: Funding Opportunity for Young Biomedical Engineers

Friday, September 27
8:00am - 9:30am
Washington Seattle Convention Center, Room 603
The Whitaker International Program, founded in 2005, provides funding to emerging U.S.-based leaders in biomedical engineering to conduct a study and/or research project, with the underlying objective of building international bridges. Grant projects – including research, coursework, public policy work – are intended to enhance both the recipient’s career and the BME field. The goal of the Whitaker Program is to assist the development of professional leaders who are not only superb scientists, but who will advance the profession through an international outlook. The Whitaker Program has three sub-programs: Fellows and Scholars Program, Summer Program, and an Undergraduate Program. For more information, including program details, the online application and deadlines, visit: http://www.whitaker.org.

Track: Translational Biomedical Engineering
OP - Fri - 1 – 18 - Room 6A

Biomaterials for Regenerative Medicine

Chairs: Karen Christman, Buddy Ratner

8:00AM
Safety and Efficacy of a Cardiac Extracellular Matrix Hydrogel for Treating Myocardial Infarction in Pre-Clinical Small- and Large-Animal Studies
K. CHRISTMAN1
1UC San Diego, La Jolla, CA

8:15AM
Therapeutic Microstructures for the Attenuation of Fibrosis after Myocardial Infarction
J. R. PINNEY1, K. T. DU1, Q. FANG2, P. AYALA1, R. SIEVERS1, L. DELROSARIO1, R. J. LEE1, and T. A. DESAI1
1University of California, San Francisco, CA, 2Beth Israel Deaconess Medical Center, Boston, MA

8:30AM
A Customizable Biological Extracellular Matrix As An Arterial Substitute In A Rabbit Model
L. GOLDBERG1, S. AMENSAO1, S. BERCIEL1, and P. MCFETRIDGE1
1University of Florida, Gainesville, FL

8:45AM
Nerve-Specific Extracellular Matrix Hydrogel for Peripheral Nerve Reconstruction
B. N. BROWN1, T. A. PRESTI1, S. T. LOPRESTI1, M. J. MARTIN2, and J. CHEETHAM2
1University of Pittsburgh, Pittsburgh, PA, 2Cornell University, Ithaca, NY

9:00AM
Duraoplasty with a Novel Synthetic Microfibrous Dural Graft In a Canine Craniotomy Model.
V. UMESH1, L. WILENSKY1, J. ENG1, G. CASADIEGO CUBIDES1, J. MA1, D. CARLIN1, S. LI1, and S. PATEL1, 2
1University of California, Berkeley, Berkeley, CA, 2NanoNerve, Inc., Berkeley, CA

9:15AM
An Engineered Liver Graft with Enhanced Blood Compatibility and Prolonged Survival
Y. KIM1, T. A. BERENDSEN1, S. OZER1, K. UYGUN1, M. L. YARMUSH1, and B. E. UYGUN1
1Harvard Medical School, Boston, MA
Friday, September 27, 2013

9:30AM – 1:00PM
POSTER SESSION – FRI – A

Track: Bioinformatics, Computational and Systems Biology

Computational Bioengineering

P – Fri - A - 1
Development of Auditory Test Modeling System (ATMS) Software Based on 3D Finite Element Model of Human Ear
X. Ji1, X. Zhang1, and R. Gan1
1University of Oklahoma, Norman, OK

P – Fri - A - 2
Towards a Computational Framework for Simulating Coupled Arterial Cells in a Realistic Vascular Geometry
M. A. Shaikh1, C. Bacon1, S. Moore2, and T. David1
1University of Canterbury, Christchurch, New Zealand, 2Argonne National Laboratory, Christchurch, New Zealand

P – Fri - A - 3
Graph-Models to Lead Genetic Signaling Path Discovery: Preliminary Ideas and Results
Y. E. Cruz-Rivera1, E. L. Lorenzo1, N. J. Ortiz1, C. E. Isaza1, and M. Cabrera-Rios1
1University of Puerto Rico - Mayaguez, Mayaguez, PR

P – Fri - A - 4
Tensor GSVD for Comparison of Two Column-Matched and Row-Independent Large-Scale Biomedical Datasets
T. E. Schomay1, P. Sankaranarayanan1, and O. Alter1
1Department of Bioengineering and Scientific Computing and Imaging Institute, University of Utah, Salt Lake City, UT

P – Fri - A - 5
Mapping Atrial Fibrillation: High Resolution Electrograms Identify Circuit Density
B. E. Benson1, R. T. Carrick1, N. Habel1, P. Biebl1, O. Bates2, and P. S. Spector1
1University of Vermont, Burlington, VT, 2Boston University, Boston, MA

P – Fri - A - 6
Velocity and Curvatures of 3-D Wave Front in Cardiac Simulation
N. Maze1, D. Haines1, and B. Roth1
1Beaumont Health System, Royal Oak, MI

P – Fri - A - 7
Modeling Platelet Aggregation on a Circulating Tumor Cell in a Microchannel
Y. Lu1, S. Lynch1, and D. Khismatullin1
1Tulane University, New Orleans, LA

P – Fri - A - 8
Ablation of Multi-Wavelet Reentry Guided by Circuit Density
R. T. Carrick1, B. E. Benson1, O. Bates1, N. Habel1, J. Bates1, and P. S. Spector1
1University of Vermont College of Medicine, Burlington, VT

P – Fri - A - 9
Towards Elucidation of Expert Beliefs and Decision-Maker Preferences About Breast Reconstruction: A Probability Wheel Application
K. Fan1, C. S. Sun1, G. P. Rees2, and M. K. Markey2
1The University of Texas at Austin, Austin, TX, 2The University of Texas MD Anderson Cancer Center, Houston, TX

P – Fri - A - 10
Structured Penalties for Regression Models--The GSVD and Partially
Empirical Eigenvectors
T. W. Randolphi
1Fred Hutchinson Cancer Research Center, Seattle, WA

P – Fri - A - 11
A Reweighted L1-minimization Based Compressed Sensing Method with the Applications into Heart Rate Variability Spectral Estimation of Unevenly Sampled Data
S-W. Chen1, S-C. Chao1, and H-Y. Teng1
1Chang Gung University, Taoyuan, Taiwan

P – Fri - A - 12
Positive Inotropy is a More Likely Mechanism for Lipid Reversal of Local Anesthetic Toxicity
B. S. Akra1
1University of Illinois at Chicago, Chicago, IL

P – Fri - A - 13
Effect of Spinal Micro-anatomy on CSF Flow Patterns
K. Tang1, T. Marrinan1, Y. Hsu1, and A. Linnenberger1
1University of Illinois at Chicago, Chicago, IL

P – Fri - A - 14
Pathogenic Mutations Affecting Native Salt Bridges in the Human Prion Protein Induce Conformational Changes
B. Mo1 and V. Dagger1
1University of Washington, Seattle, WA

P – Fri - A - 15
A Multi-phase CFD Model for the Simulation of Blood Flow in Microfluidic Devices
E. B. Durant1, K. V. Sharp1, and A. Z. Higgins1
1Oregon State University, Corvallis, OR

P – Fri - A - 16
Modeling RNA Devices for Applications in Synthetic Biology
J. T. Stevens1, W. Voje, Jr.1, R. Correa1, and J. M. Carothers1
1University of Washington, Seattle, WA

P – Fri - A - 17
Low-Cost EEG-Based Assistive Technology for People with Motor Disabilities
R. Begossi1, L. P. Dos Santos1, K. R. Cotosck1, and J. S. Ide1
1UNIFESP, São José dos Campos, Brazil

P – Fri - A - 18
Vector Length Selection in a Fixed Point Digital Quadratic Integrator and Fire Neuron
E. Basham1 and D. Parent1
1SJSU, San Jose, CA

Track: Bioinformatics, Computational and Systems Biology

Dynamics of Biological Systems

P – Fri - A - 19
Generation and Loss Mechanisms for the Endothelial Glycocalyx Layer
K. Giantos-Adams1, G. Garcia-Cardenas2, and C. Dewey Jr3
1University of Illinois - Chicago, Chicago, IL, 2Illinois Institute of Technology, Chicago, IL, 3Harvard Medical School, Boston, MA

P – Fri - A - 20
The Affinity Gradient in the Nuclear Pore Complex is Optimized to Maximize Transport Rate
M. Azimi1 and M. Mofrad1
1University of California Berkeley, Berkeley, CA
9:30AM – 1:00PM POSTER SESSION FriA

POSTER VIEWING WITH AUTHORS & REFRESHMENT BREAK | 9:30AM - 10:30AM

P – Fri - A - 21
Models of the Nuclear Pore Complex: Structure, Mechanochemistry, and Function
M. R. MOFRAD1
1University of California, Berkeley, Berkeley, CA

P – Fri - A - 22
Exploring Network Dynamics of the Working Brain During Upper Extremity Movements
D. E. NATHAN1, R. W. PROST2, S. J. GUASTELLO1, and D. C. JEUTTER1
1Marquette University, Milwaukee, WI, 2Medical College of Wisconsin, Milwaukee, WI

P – Fri - A - 23
The Effect of Heart Rate Variability on Alternans Formation in the Heart
S. D. MCDONNELL1, V. KAKADE1, Y. MORI1, and E. TOLKACHEVA1
1University of Minnesota, Minneapolis, MN

P – Fri - A - 24
Multiscale Population Balance Equation Model for Heterogeneous Human Pluripotent Stem Cell Populations: Determination of Single-cell Physiological State Functions
M. R. ROSSANT1, J. WU2, and E. S. TZANAKAKIS3
1SUNY-Buffalo, Buffalo, NY

P – Fri - A - 25
Parametric and Non-parametric Mathematical Modeling of Experimental Endotoxemia
S. E. EIKENBERRY1 and V. Z. MARMARELIS1
1University of Southern California, Los Angeles, CA

P – Fri - A - 26
Network Models of Biomolecular Dynamics to Probe Mechanisms of Drug Resistance
P. KASSON1,2
1University of Virginia, Charlottesville, VA, 2Google, Inc, Mountain View, CA

P – Fri - A - 27
A Three-Enzyme Cascade During N-Glycan Branching: The Minimal Model for Ultrasensitivity
G. LIU1 and S. NEELAMEGHAM1
1State University of New York, Buffalo, NY

P – Fri - A - 28
Switch-Like Systems From Non-Cooperative Biological Parts: A Theoretical Basis for Engineering Illusory Cooperativity
M. BINDSCHADLER1 and J. B. BASSINGTHWAITE2
1U. Washington, Seattle, WA, 2University of Washington, Seattle, WA

P – Fri - A - 29
Immune Cell Mediated Transcription Factor Activity in Metastatic Breast Cancer Cells
B. A. AGUADO1, S. M. AZARIN2, R. M. GOWER2, J. S. JERUSS3, and L. D. SHEA1
1Northwestern University, Chicago, IL, 2Northwestern University Feinberg School of Medicine, Chicago, IL

P – Fri - A - 30
Monitoring and Supervision of Machine Perfusion Resuscitation of Rat Livers
S. PERK1, M. L. IZAMIS1, H. TOLBOOM2, B. UYGUN3, M. YARMUSH1,4, and K. UYGUN1
1Massachusetts General Hospital, Harvard Medical School, Shriners Hospitals for Children, Boston, MA, 2University Hospital Zurich, Zurich, Switzerland, 3Rutgers University, Piscataway, NJ

P – Fri - A - 31
Input-Output and Compartmental Modeling of Cerebral Hemodynamics
B. C. HENLEY
1University of Southern California, Los Angeles, CA

P – Fri - A - 32
A New Way to Look at Trajectory Data in Biology
G. PECASSO1, D. MALASPINA1, T. HOPE1, J. I. SZNAJDER1, and I. SZLEIFER1
1Northwestern University, Evanston, IL

P – Fri - A - 33
Modeling the Cardiovascular and Endocrinologic Adaptations of Pregnancy
V. L. WOLF1,2, W. A. PRIETTI1, and R. L. HESTER1
1University of Mississippi Medical Center, Jackson, MS, 2Mississippi State University, Mississippi State, MS

P – Fri - A - 34
Effects of Propofol on Neocortical Signals and Information Processing in Humans and Felines
S. J. HARIHARAN1, Z. KAGAN1, R. A. PARKER1, T. OGURO1, T. OBARA1, T. D. EGAN1, P. A. HOUSE1, and B. GREGER1
1University of Utah, Salt Lake City, UT, 2University of Pittsburgh, Pittsburgh, PA, 3National Defense Medical College, Tokorozawa, Japan, 4Fukushima Medical University, Fukushima, Japan

P – Fri - A - 35
A Novel Stochastic Model of Cardiac CaMKII Activation
P. T. FOTENIOU1, J. L. GREENSTEIN2,3, and R. L. WINSLOW2,3
1Institute for Computational Medicine, The Johns Hopkins University, Baltimore, MD, 2Whitaker Biomedical Engineering Institute, The Johns Hopkins University, Baltimore, MD

P – Fri - A - 36
The Spatio-temporal Dynamics of Spontaneous Activity in the Developing Retina
B. J. LANDSEED1 and J. N. KUTZ1
1University of Washington, Seattle, WA

P – Fri - A - 37
Investigating Dynamical Properties of the C. elegans Connectome through Full-Network Simulations
J. M. KUNERT1, E. SHLIZERMAN1, and J. KUTZ1
1University of Washington, Seattle, WA

P – Fri - A - 38
Fluctuations in Calcium Concentration Influence Calcium Spark Dynamics in Cardiac Myocytes
S. H. WEINBERG1 and G. D. SMITH1
1College of William and Mary, Williamsburg, VA

P – Fri - A - 39
The Role of Oxidative Stress in eNOS Catalyzed NO Production
S. KARI1, K. C. DAS2, and M. KAVDIA1
1Wayne State University, Detroit, MI, 2Texas Tech University Health Sciences Center, Lubbock, TX

P – Fri - A - 40
Consequences of Axonal Injuries to Neural Propagation Dynamics: A Computational Study
P. D. MAIA1 and N. KUTZ1
1University of Washington, Seattle, WA

P – Fri - A - 41
Bifurcating Response to Hemorrhage in a Population of Mathematical Models of Human Circulation
W. A. PRIETTI1, G. HUSBAND2, K. BELLAMY3, M. DAKHLALLA4, T. COLEMAN1, and R. L. HESTER1
1University of Mississippi Medical Center, Jackson, MS, 2Houndebit University, Nashville, TN, 3Mississippi State University, Starkville, MS

P – Fri - A - 42
Sparse Sensing in Mechanosensory Systems
S. L. BRUNTON1, B. W. BRUNTON1, A. EBERLE1, and J. N. KUTZ1
1University of Washington, Seattle, WA
Track: Bioinformatics, Computational and Systems Biology

Modeling of Regulatory Networks

P – Fri - A - 44
Computer Simulations of Mutations and In Silico Development of Therapies in the TGF-β Signal Transduction Pathway
D. NICKLAS1 and L. SAIZ1
1University of California, Davis, CA

P – Fri - A - 45
Nonlinear Signal Processing via Noise Propagation
K. H. Kim1, H. QIAN1, and H. M. SAURO1
1University of Washington, Seattle, WA

P – Fri - A - 46
Myofibril Acetylation-Induced Regulation of Cross-Bridge Dynamics in Cardiac Muscle
K. RELWANI1, S. H. SMITH1, and S. G. SHROFF1
1University of Pittsburgh, Pittsburgh, PA

Gene Regulation Network on Megakaryocytic/Erythroid Differentiation of K562 Cells by PMA/Hemin
L. WANG1, D. ZHOU1, and Z. LU1,2
1Southeast University, Nanjing, China, People’s Republic of; 2Lanzhou University, Lanzhou, China, People’s Republic of

Dealing with ROS in Mitochondrial-Related Diseases: A Model of Cellular Defense Against Excessive ROS Generation
A. KOLODKIN1, A. IGNATENKO1, E. SMEDNISD1,2, V. SANGAR1, C. CHOE1, B. PETERS1, N. D. PRICE1, R. BALLINS1, and N. BRADY1
1Luxembourg Centre for Systems Biomedicine, Esch-sur-Alzette, Luxembourg, and Institute for Systems Biology, Seattle, WA, 2University of Luxembourg, Luxembourg, Luxembourg, 
3German Cancer Research Center and Biocant, Heidelberg, Germany

A Computational Model of Bcl-2 Regulated Apoptosis: Bistability Revisited
B. J. LANSDELL1, R. KLUCK1,2, E. LEE1,2, D. FAIRLIE1,2, F. FRASCOLI1, M. O’HELY1, K. LANDMAN1, and T. SPEED1
1University of Washington, Seattle, WA, 2Walter and Eliza Hall Institute, Melbourne, VIC, Australia, and 3University of Melbourne, Melbourne, VIC, Australia

Gene Regulatory Network Modeling via Rank Constrained Optimization
R. ARASTOO1, V. V. KULKARNI1, N. MOTIE1, and M. V. KOTHARE1
1Lehigh University, Bethlehem, PA, 2University of Minnesota, Minneapolis, MN, 3Lehigh University, Bethlehem, PA

Track: Biomaterials

Bioinspired Materials

P – Fri - A - 51
Redox-Responsive Complexes Derived from Tannin-Like Polymers
O. Z. FISHER1 and H. A. CHENG1
1Temple University, Philadelphia, PA

P – Fri - A - 52
Engineering Cholesterol-based Hybridized Fibers for Enhanced Surface Functionalization
C. M. COH1, S. L. LEUNG1, and X. WU1
1University of Arizona, Tucson, AZ

P – Fri - A - 53
Injectable Resinil-based Elastomeric Hydrogels for Vocal Fold Therapies
L. LI1, Z. TONG1, J. XIA1,2, and K. L. KICK1
1University of Delaware, Newark, DE, 2Delaware Biotechnology Institute, Newark, DE

P – Fri - A - 54
Biodegradable Photo-crosslinked Polycarbonates from the Natural Product Quinic Acid
L. A. LINK1, A. T. LONNECKER1, K. HEARD1, J. E. RAYMOND1, and K. L. WOOLEY1
1Texas A&M University, College Station, TX

P – Fri - A - 55
A Novel Biomimetic Collagen-Apateite Scaffold for Bone Tissue Engineering Applications
Z. XIA1, M. WEN1, and D. ROWE1
1University of Connecticut, Storrs, CT, 2University of Connecticut Health Center, Farmington, CT

P – Fri - A - 56
Self-healable and injectable PEG hydrogels via selective metal-ligand interaction
T. SATO1, M. EBARA1, S. TANAKA1, T-A. ASOH1, A. KIKUCHI1, and T. Aoyagi1,2
1Tokyo University of Science, Katsushika, Japan, 2NIMS, Tsukuba, Japan, 3NOF.co., Tsukuba, Japan, 4University of Tsukuba, Tsukuba, Japan

P – Fri - A - 57
Low-Cost Simulated Human Tissues for a Wide Range of Tissue Types and Training Applications
S. S. NEWMAN1, L. WHITE1, V. HOU1, and B. HANNAFORD1
1University of Washington, Seattle, WA

P – Fri - A - 58
Snaping Surfaces of the Venus flytrap’s Fast Motion and Bio-mimetic flytrap-robots
Z. CHEN1, Q. GUO1,2, H. ZHENG1, S. XIE1, G. SU1, J. LIN1, Y. LIU1, Y. DING1, W. CHEN1, and L. TABER1
1Washington University in St Louis, Saint Louis, MO, 2Fuzhou University, Fuzhou, China, People’s Republic of, 3Fujian Institute of Technology, Fuzhou, China, People’s Republic of, 4Fujian Radio and Television University, Fuzhou, China, People’s Republic of, 5Washington University in St Louis, Saint Louis, MO, 6Wuhan Foreign Languages School, Wuhan, China, People’s Republic of, 7Tsinghua University, Beijing, China, People’s Republic of

P – Fri - A - 59
Communicating With Cells by Incorporating Functional Intercellular Junctions in Therapeutic Vesicles
A. M. GAOK1, D. J. BUSCH1, J. T. JOSE1, and J. C. STACHOWIAK1
1University of Texas at Austin, Austin, TX

P – Fri - A - 60
Smart Cortical Bone Allografts for Critical Sized Defects: Engineering a Biomimetic Periosteum
R. ROMERO1, L. CHUBB1, N. EHRHART1, and M. J. KIPPER1
1Colorado State University, Fort Collins, CO
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9:30AM – 1:00PM POSTER SESSION FriA

POSTER VIEWING WITH AUTHORS & REFRESHMENT BREAK | 9:30AM - 10:30AM

Track: Biomaterials

Biomaterial Design

P – Fri - A - 61
Percolation Phenomena of Alginate and Hyaluronic Acid Blended Films
S. MAYES, J. DAVIS, AND C. E. SCHMIDT
UT Austin, Austin, TX
‘The University of Florida, Gainesville, FL

P – Fri - A - 62
Poly(propylene) Fumarate as Reinforcement for Cardiovascular Applications
L. G. BRACAGLIA, P. SHARMA, N. HIBINO, AND J. P. FISHER
University of Maryland, College Park, MD, ‘Children’s National Medical Center, Washington, DC

P – Fri - A - 63
Molecular Distribution of Bioreactive Groups in Dextran-chitosan Sealants Confers Tissue-specific Adhesion
J. FERDOUT, E. J. JUAREZ-PEIREZ, AND T. SHAZLY
University of South Carolina, Columbia, SC

P – Fri - A - 64
Synthesis of PCL/Keratin Composite Nanofibers for Nerve Repair
A. EDWARDS, T. HOPKINS, S. PITLEY, AND N. BHATTARA
North Carolina A&T State University, Greensboro, NC, ‘University of Cincinnati, Cincinnati, OH

P – Fri - A - 65
PEDOT-Gelatin Composites Mediate Brain Endothelial Cell Adhesion
‘Department of Bioelectronics, Ecole Nationale Superieure des Mines, CMP-EMSE, MOC, Gardanne, France, ‘Materials Engineering, Monash University Clayton, Victoria, Australia, ‘Department of Materials Science and Engineering, Stanford University, Stanford, CA

P – Fri - A - 66
Two Dimensional Carbon and Inorganic Nanostructures Reinforced Biodegradable Polymeric Nanocomposites for Bone Tissue Engineering
Stanford Brook University, Stony Brook, NY, ‘Rice University, Houston, TX

P – Fri - A - 67
Protein Resistance of Surface-grafted PEG-Silane Amphiphiles with Variable PEG Segment Lengths on a Model Substrate
M. A. RUFFIN, J. A. GRUETZNER, M. J. HURLEY, M. L. HAWKINS, AND M. A. GRUNLAN
Texas A&M University, College Station, TX

P – Fri - A - 68
Nanopatterned Polymers Have Antibacterial Properties
E. LIANG, N. INO, AND A. YEE
‘University of California, Irvine, Irvine, CA

P – Fri - A - 69
Development of Sugar-responsive Hydrogel Rods as a Sacrificial Template to Create Vessel-like Structures in Collagen Gels
M. YAMAMOTO, K. ARIMOTO, AND Y. TABATA
Kyoto University, Kyoto, Japan

P – Fri - A - 70
Iron Substituted Hydroxyapatite an Intrinsically Magnetic Biomaterial
M. ZILM, M. JAIN, AND M. WEI
‘University of Connecticut, Storrs, CT

P – Fri - A - 71
Fabrication and Characterization of Novel Polymer-Contrast Agent Composites for Near-Infrared In Situ Imaging
A. STEVENSON, L. REESE, R. SHEKHAR, L. BICKFORD, AND A. WHITTINGTON
Virginia Tech, Blacksburg, VA, ‘Children’s National Medical Center, Washington, DC

P – Fri - A - 72
On Demand Reversible Degradation of Dendrimer-Dextran Based Bioadhesives Triggered by UV Irradiation
M. MIER CERVANTES, K. KELMANSKY, E. EDELMAN, AND N. ARTZI
Harvard-MIT Division for Health Sciences and Technology, Cambridge, MA, ‘Institut Quimic de Sarrià, Barcelona, Spain, ‘Ort Braude College, Karmiel, Israel, ‘Harvard Medical School, Boston, MA

P – Fri - A - 73
Development of a Synthetic Thermosensitive Hydrogel for Drug Delivery after Spinal Cord Injury
P. Z. ELIAS, H. WEI, P. J. HORNRI, AND S. PUN
University of Washington, Seattle, WA

P – Fri - A - 74
Metal-directed Assembly of Stimuli-responsive Hydrogels Composed of Polypeptide Micelles
A. GHODRACHI, J. SIMON, A. CHILKOTI, AND G. LÓPEZ
Duke University, Durham, NC

P – Fri - A - 75
A Cross-linking Technique for Rapid Prototyping of 3D Micropatterned Cell-Laden Hydrogels
A. L. RUTZ AND R. N. SHAH
Northwestern University, Evanston, IL

P – Fri - A - 76
Autologous Materials for Promoting a Perfused Vasculature
B. S. SHERILL AND E. B. BOTVINICK
University of California Irvine, Irvine, CA

Track: Biomaterials

Intelligent Biomaterials

P – Fri - A - 77
A Smart Hyperthermia Nanofiber with Switchable Drug Release for Cancer Therapy
M. EBARA
National Institute for Materials Science, Tsukuba, Japan

P – Fri - A - 78
Stimuli-Responsive Polypeptide Microparticles
J. SIMON, A. GHODRACHI, A. CHILKOTI, AND G. LÓPEZ
Duke University, Durham, NC

P – Fri - A - 79
Self-Cleaning Membranes for Implanted Glucose Biosensors
A. K. MEANS, R. FEI, AND M. A. GRUNLAN
Texas A&M University, College Station, TX
Track: Biomaterials

Self-assembling Biomaterials

**P – Fri - A - 81**
Elastin Based Nano-particles for Treatment of Chronic Wounds

**Y. YUAN** and P. KORIA

1University of South Florida, Tampa, FL

**P – Fri - A - 82**
Influence of Aspect Ratios in Cellular Uptake, Phagocytosis and Tumor Homing of Tobacco Mosaic Virus (TMV) Viral Nanoparticles

**S. SHUKLA**, F. EBBER, S. EIBEN, C. WEGE, and N. F. STEINMETZ

1Case Western Reserve University, Cleveland, OH, 2University of Stuttgart, Stuttgart, Germany

**P – Fri - A - 83**
Temperature Dependent Characterization of Collagen and Methacrylated Collagen

**K. DRZEWIECKI**, J. GAUDET, J. KHAN, D. PIKE, V. NANDA, and D. SHREIBER

1Rutgers, The State University of New Jersey, Piscataway, NJ, 2Robert Wood Johnson Medical School, Rutgers, The State University of New Jersey, Piscataway, NJ

**P – Fri - A - 84**
DNA Circuit Boards for Molecular Computation

**G. CHATTERJEE**, R. MUSCAT, K. STAASS, L. CEZE, and G. SEELIG

1University of Washington Seattle, Seattle, WA, 2Microsoft Research, Redmond, WA

**P – Fri - A - 85**
Design of New Modular Repeat Proteins for Assembly of Large Structures

**F. PARMEGGIANI**, P. HUANG, and D. BAKER

1University of Washington, Seattle, WA

Track: Biomaterials

Spatio-temporal Control of Biomolecules

**P – Fri - A - 86**
Analysis of Sensory Neuron Axon Growth on Two-dimensional Photolithographic Gradients of Covalently Immobilized Chemotactic Factors

**B. JODDAP**, A. T. GUY, H. KAMIGUCHI, and Y. ITO

1RIKEN Advanced Science Institute, Wako, Japan, 2RIKEN Brain Science Institute, Wako, Japan

**P – Fri - A - 87**
Gradients of Stiffness and/or Matrix-Bound Growth Factor on Biopolymeric Films Influence Cell Repose

**J. ALMODOVAR**, F. DALONNEAU, T. BOUDOU, S. SELIMOVIC, H. LORTAT-JACOB, A. KHREIMOSSEHI, and C. PICART

1Grenoble Institute of Technology, Grenoble, France, 2Harvard Medical School, Cambridge, MA, 3Massachusetts Institute of Technology, Cambridge, MA, 4Institut de Biologie Structurale, Grenoble, France, 5Harvard University, Cambridge, MA

**P – Fri - A - 88**
Guided Neurite Outgrowth of Cultured Neurons on a Polyllysine-on-polylysine Microaptramet

**S. JOO** and Y. NAM

1KAIST, Daedeo, Korea, Republic of

**P – Fri - A - 89**
Spatiotemporal Detection of Localized Reactive Oxygen Species in Cell Signaling and Homeostasis

**M. A. GRAN**, K. G. REDDE, N. MURTHY, and M. L. KEMP

1Georgia Institute of Technology and Emory University, Atlanta, GA, 2University of California Berkeley, Berkeley, CA

**P – Fri - A - 90**
Fabrication of Hydrogel-incorporated Nanofiber Scaffold Capable of Independent Release of Multiple Growth Factors and Its Application to Bone Regeneration

**H. LEE**, S. HAN, U. CHUNG, and W-G. KOH

1Yonsei University, Seoul, Korea, Republic of

**P – Fri - A - 91**
Effect of Encapsulated Species on the Transport of Small Molecules through Hydrogels

**R. M. UNRUH** and M. J. McSHANE

1Texas A&M University, College Station, TX

**P – Fri - A - 92**
A Novel System for the Encapsulation and Release of Pro-angiogenic Proteins using Light-triggered Liposomes

**J. PARK**, R. S. STOWERS, and L. J. SUGGS

1University of Texas, Austin, TX

Track: Biomaterials

Biomaterials

**P – Fri - A - 93**
In Vitro and In Vivo Characterization of Porous Dexamethasone Releasing Coatings for Glucose Biosensors

**S. G. VALLEJO-HELION** and W. M. REICHERT

1Duke University, Durham, NC

**P – Fri - A - 94**
Aptamer-Carrying Hydrogels for Detection of Cell Secreted Interferon Gamma

**G. ZHOU**, D-S. SHIN, K. SON, and A. REVZIN

1UC Davis, Davis, CA

**P – Fri - A - 95**
Role of Microenvironmental Stiffness on the Response of Human Neural Cells to Environmental Toxins

**K. RAMAMOORTHY**, C. ITO, and P. ASURU

1Santa Clara University, Santa Clara, CA

**P – Fri - A - 96**
Effect of Variable Tissue ECMs on Cell Function/Behavior

**V. BEACHLEY**, M. GIBSON, C. PARADIMITRIOU, and J. ELISSEEFF

1Johns Hopkins University, Baltimore, MD

**P – Fri - A - 97**
A Comparison of the Water Uptake and Eggshell Mechanical Properties of Two Lizard Species: Sceloporus occidentalis and Sceloporus graciosus

**F. Y. SU**, A. SCHUBAUER, E. J. ORWIN, and S. C. ADOLPH

1Harvey Mudd College, Claremont, CA

**P – Fri - A - 98**
Creep Behavior of Solder Joints Under Combined Tension and Shear Stresses

**M. ALLAM**, G. SELVADURAY, V. VUKACICH, and M. ABTEIV

1San Jose State University, San Jose, CA, 2Sanmina-SCI, San Jose, CA

**P – Fri - A - 99**
Characterization of a Silver Nanoparticle Infused High Strength Tissue Adhesive for Ophthalmic Use

**W. YEE**, G. SELVADURAY, and B. G. HAWKINS

1San Jose State University, San Jose, CA

**P – Fri - A - 100**
The Effect of Surface Treatment on Nickel Leaching from Nitinol

**D. MADAMBA** and G. SELVADURAY

1San Jose State University, San Jose, CA
Track: Biomedical Engineering Education

Best Practices for Interactions with Industry

P – Fri - A - 101
Master of Engineering Design Projects with External Sponsors: Critical Issues and Factors for Successfully Educating Students in Biomedical Development
D. LIPSON1, R. NEWMAN1, AND J. THOMPSON1
Cornell University, Ithaca, NY

P – Fri - A - 102
Engineering, Education and Inclusion: Center for Development and Transfer of Assistive Technology
F. V. CARVALHO2 AND C. C. GARCEZ2
IPTEC, S. Rita Do Sapucai, Brazil

Track: Biomedical Engineering Education

Biomedical Education for the New World

P – Fri - A - 103
Graduate Level Course in Biomedical Engineering for Global Health
L. R. BICKFORD1 AND C. GABLER2
Virginia Tech, Blacksburg, VA

P – Fri - A - 104
Discovering Congenital Defects in the Classroom: an Inquiry-based Approach to Study Embryonic Growth Using Ex-ovo Chicken Culture
J. RICHARDS1, S. ARCHER1, AND J. BUTCHER1
Cornell University, Ithaca, NY

P – Fri - A - 105
The Temperature of Biomedical Entrepreneurship
J. TRANUCCI1
Bucknell University, Lewisburg, PA

P – Fri - A - 106
Evolution of ASU’s Biomedical Product Design and Global Health Technology Center: Building Capacity Toward a Community & Global Partnership, Pathway and Pipeline6
V. PIZZICONI1, J. LA BELLE1, D. FRAKES1, M. CAPLAN1, AND C. TRIPLETT1
Arizona State University, Tempe, AZ

P – Fri - A - 107
A Problem Based Learning Introductory Course to Biomedical Engineering
D. M. GAITAN-LEON1 AND J. C. BRICENO1
Universidad de los Andes, Bogota, Colombia

Track: Biomedical Engineering Education

Fostering Collaborations

P – Fri - A - 108
Becoming a Resident Scientist in a High School Classroom: Fostering Collaborations with High School Educators and Creating Meaningful Curriculum Materials
B. N. MASON1, L. AUSTEN1, S. D. ARCHER1, AND C. A. REINHART-KING1
Cornell University, Ithaca, NY; Elmira City Schools, Elmira, NY

P – Fri - A - 109
Developing Interdisciplinary Research Partners: The Xxxxx by Yyyyy
Neuro Collaboration Research URE
B. B. FASSE1 AND J. SCHWABE1
1Georgia Institute of Technology, Atlanta, GA

Track: Biomedical Engineering Education

Laboratory Modules and Instructional Materials

P – Fri - A - 110
Novel Central Venous Catheterization Simulation for Medical Training
A. BARRETT1, E. BURGHARDT1, J. HODGES1, N. LUEDICKE1, R. THOMAS1, D. DEAN1, AND J. NAGATOMI1
Clemson University, Clemson, SC

P – Fri - A - 111
Interdisciplinary Laboratory Course in Biosignal Measurement
K. MAY-NEWMAN1, R. BANERJEE1, AND Y. K. WONG1
San Diego State University, San Diego, CA

P – Fri - A - 112
A Novel Bioengineering Laboratory Course: Integrating Experimentation with Computational Simulation and Analysis
A. TAYLOR1
University of Washington, Seattle, WA

P – Fri - A - 113
Building Experimental Design Skills Using Learning Modules
A. L. SIEVING1, M. A. POOL1, A. T. DAVIDSON1, K. A. STUART1, AND A. E. RUNDELL1
Purdue University, West Lafayette, IN

P – Fri - A - 114
Integrating Information Literacy into a Situated Learning Preliminary Design Course
M. A. POOL1, A. O. BRIGHTMAN1, C. W. PEAK1, A. L. SIEVING1, AND A. E. RUNDELL1
Purdue University, West Lafayette, IN

P – Fri - A - 115
The Design and Implementation of a Four Year Medical Device Product Design Spine
J. T. LA BELLE1, D. FRAKES1, J. KLEIM1, M. CAPLAN1, K. HAYNES1, A. GARCIA1, S. HELMST-LILLERY1, AND V. PIZZICONI1
Arizona State University, Tempe, AZ

Track: Biomedical Engineering Education

New Approaches to Biomedical Engineering Design

P – Fri - A - 116
Innovation and Translation Training Modules for PhD Students
K. L. BILLIAR1, G. GAUDETTE1, F. HOI1, AND T. A. CAMESANO1
Worcester Polytechnic Institute, Worcester, MA
Track: Biomedical Imaging and Optics

Biomedical Engineering Education

P – Fri - A - 117
Clinical Training for BME Graduate Students
W. OLBrecht1, P. Doerschuk1, Y. WANG1, W. Fraley1, C. Schaffer1, and S. Archer1
1Cornell University, Ithaca, NY, 2Weill Cornell Medical College, New York, NY

P – Fri - A - 118
CANCELED BY AUTHOR

P – Fri - A - 119
Integrating Grant Proposal Development into an Interdisciplinary Graduate Course
E. Seker1
1University of California, Davis, Davis, CA

Track: Biomedical Imaging and Optics

Computer Tomography

P – Fri - A - 121
Numerical Observer Based Quantitative Evaluation Method for CT Reconstruction
M. Wang1, C. Miao1, B. Liu1, and H. Yu1
1VT/WFU School of Biomedical Engineering and Sciences, Wake Forest University Health Sciences, Winston Salem, NC, 2North Carolina State University, North Carolina, People’s Republic of China

P – Fri - A - 122
Cardiac CT Architecture with Lower Radiation Dose and Higher Temporal Resolution
H. Gong1, B. Liu1, O. Ghazemalazadeh1, H. Yu1, G. Wang1, and G. Cao1
1Virginia Polytechnic Institute and State University, Blacksburg, VA, 2Wake Forest University, Winston Salem, NC, 3renselaer polytechnic institute, Troy, NY

P – Fri - A - 123
GPU-based Fast Implementation for Interior Tomography
R. Liu1 and H. Yu1
1Wake Forest University Health Sciences, Winston-Salem, NC

P – Fri - A - 124
Tractography of Rat Brain in Phase-contrast X-ray CT
S. Kokubo1, L. Thet-Thet1, A. Yoneyama1, H. Maruyama1, and T. Takeda1
1Kitsato University, Sagamihara, Kanagawa, Japan, 2Kitsato University, Sagamihara, Kanagawa, Japan, 3Hitachi Ltd, Hatoyama, Saitama, Japan

P – Fri - A - 125
An Electrocardiograph Chip to Rotate Live Cells for Computerized Tomographic Imaging
M. Stanley1, I. S. Elango1, A. Shahbilla1, D. Smith1, P. Linsirichati1, H. Zhu1, H. Wang1, S.-H. Chao1, L. Kelbauskas1, R. H. Johnson1, and D. R. Meldrum
1Biosense Institute-Arizona State University, Tempe, AZ

P – Fri - A - 126
Assessment of Thoracic Deformity in the Transverse Plane Relative to Space Available for the Lung & Cobb Angle in Adolescent Idiopathic Scoliosis
J. A. Harris1, R. M. Campbell1, Jr., and S. Balasubramaniam1
1Drexel University, Philadelphia, PA, 2Children’s Hospital of Philadelphia, Philadelphia, PA

Track: Biomedical Imaging and Optics

Functional Imaging

P – Fri - A - 127
Comparison of Oxygen Kinetics in the Upper Trapezius in Patients with Chronic Neck Pain and Myofascial Trigger Points Before and After Treatment
M. M. Zaazda1, A. Eranko1, L. Gerber1, and S. Skidar1
1George Mason University, Fairfax, VA

P – Fri - A - 128
Molecular Breast Imaging Using a Variable Angle Slant Hole Collimator
O. Göpın1 and D. Gilland1
1University of Florida, Gainesville, FL

P – Fri - A - 129
Non-iterative BIR Reconstructions of Ventilation from a Pairwise Current Injection System
M. F. Montoya1, J. Mueller1, and R. Gonzalez Lima2
1Colorado State University, Fort Collins, CO, 2University of São Paulo, São Paulo, Brazil

P – Fri - A - 130
Quantitative Assessment of Response to Breast Cancer Therapy using a Combined PET/X-ray Scanner
C. Zeng1, L. Pierce1, K. Kanal1, L. MacDonald1, and P. Kinahan1
1University of Washington, Seattle, WA

Track: Biomedical Imaging and Optics

Image-guided Therapy and Drug Delivery

P – Fri - A - 131
The Use of Twinkling Artifact of Doppler Imaging to Monitor Cavitation in Tissue During High Intensity Focused Ultrasound Therapy
T. Li1, O. A. Sapoznikov1, T. Khokhlov1, and J. H. Wang1
1University of Washington, Seattle, WA, 2Moscow State University, Moscow, Russian Federation

P – Fri - A - 132
Creation and Validation of a Tissue Phantom for the Improvement of Ultrasound Thermometry
C.Y. Lai1, D. E. Kruse1, K. W. Ferrara1, and C. F. Caskey1
1University of California at Davis, Davis, CA

P – Fri - A - 133
Non-invasive Determination of Bioheat Transfer Parameters for Improved MRgHIFU Treatment Planning
C. R. Dillon1, D. Christiansen1, and R. Roemer1
1University of Utah, Salt Lake City, UT

P – Fri - A - 134
Blurred Edge Detection using a Gradient-based, Modified Fuzzy K-means Clustering Method
Y. Feng1 and Y. Hu1
1Washington University, Saint Louis, MO
Track: Biomedical Imaging and Optics

Molecular Probes

P – Fri - A - 135
Iron Oxide Based Polymer Nanocomplex for Functional Detection of Atherosclerosis
A. L. Doiron1 and O. Z. Fisher2
1Binghamton University, Vestal, NY; 2Temple University, Philadelphia, PA

P – Fri - A - 136
NanoCluster Beacons as Reporters for Rolling Circle Enhanced Enzyme Activity Detection
J. M. Ojeda1, S. Juul2, J. C. Liu1, R. A. Batson1, B. R. Knudsen1, Y-P. Ho1, K. W. Leong2, and H-C. Yeh2
1University of Texas at Austin, Austin, TX; 2Ohio University, Durham, NC; 3Aarhus University, Aarhus, Denmark

P – Fri - A - 137
Targeting Fibrin for In Vivo Imaging of Cardiovascular Disease
A. C. Brown1, S. Stabenfeldt2, V. Stefanelli2, L. Tucker2, and T. Barker2
1Georgia Institute of Technology, Atlanta, GA; 2Arizona State University, Tempe, AZ; 3Emory University, Atlanta, GA

P – Fri - A - 138
Size-tunable RGD Peptide Functionalized, I251 Labeled, Au Nanoparticles for Thromonotics of Cancer
L. Zhang1, Y. Yang1, C. Zhang1, and L. X. Xu1
1Shanghai Jiao Tong University, Shanghai, China; People’s Republic of

Track: Biomedical Imaging and Optics

MRI

P – Fri - A - 139
Ferumoxylal Iron Oxide Nanoparticle Trafficking from Brain to Lymph Nodes
1Oregon Health & Science University, Portland, OR; 2Portland VA Medical Center, Portland, OR

P – Fri - A - 140
Transition Metal-containing Polyoxometalates: A New Type of Molecular MRI Agents for Cancer Diagnosis
J. Song1, X. Zhang1, J. Mi1, C. Hill1, X. Hu1, and S. Nie1
1Emory University, Atlanta, GA; 2Georgia State University, Atlanta, GA; 3Emory University and Georgia Institute of Technology, Atlanta, GA

P – Fri - A - 141
Quantitative MRI Volumetry in Detection of Hippocampal Atrophy and Pathologies
P. Niu1, Z. Chen1, C. Chen1, Z. Wang1, P. Yang1, Y. Yu1, and J. M. Cavanaugh1
1Fuzhou General Hospital of Nanjing Military Area Command of Chinese PLA, Fuzhou, China; People’s Republic of; 2Wayne State University, Detroit, MI

P – Fri - A - 142
Thermal and Electromagnetic Modelling of a Superconducting RF Coil for Magnetic Resonance Imaging
B. Proniewski1,2 and H. Figiel3
1AGH University of Science and Technology, Krakow, Poland; 2Jagiellonian Centre for Experimental Therapeutics (UCET), Krakow, Poland

P – Fri - A - 143
MR Imaging of Tumor Permeability in Brain Metastases at 7T
1University of California, Davis, CA; 2University of Bergen, Bergen, Norway; 3Northwestern University, Evanston, IL; 4Goethe-University Medical School, Frankfurt am Main, Germany

P – Fri - A - 144
MRI Detection of Osteoporosis
A. Ravikumar1, E. G. Randou1, M. Zaghrou2, R. W. Newcomb3, and V. N. Ikonomidou4
1George Mason University, Fairfax, VA; 2George Washington University, Washington, DC; 3University of Maryland, College Park, MD

P – Fri - A - 145
Fast Directional Interpolation for MR Velocimetry Data
A. Pradeep1, C. Zhao1, D. Soerensen1, H. Babiker3, K. Sundareswaran3, A. Yogananthan3, and D. Frakes1
1Arizona State University, Tempe, AZ; 2Georgia Institute of Technology, Atlanta, GA; 3Thoratec Corporation, Pleasanton, CA

P – Fri - A - 146
Synthesis, Optimization of Mn2+ Loading and In-vitro toxicity assessment of Dextran coated Graphene Nanoplatelets
J. M. Fang1, S. C. Chowdhury1, S. Kanakia1, S. Lee1, and B. Satharaman1
1SUNY Stony Brook University, Stony Brook, NY

Track: Biomedical Imaging and Optics

Ultrasound Imaging

P – Fri - A - 147
Ultrasound Imaging and Therapy via Flow-Focusing Microfluidic Device Generated Albumin-stabilized Microbubbles
A. J. Dixon3, J. L. Chen3, A. H. Dhanalilv3, A. L. Klabinov3, and J. A. Hossack1
1University of Virginia, Charlottesville, VA

P – Fri - A - 148
Longitudinal Evaluation of Mouse Colon Tumors by Endoluminal Ultrasound Biomicroscopy
R. C. Soletti1, K. Z. Alves1, M. A. Britto1, D. G. De Matos1, M. Soldan1, H. L. Borges1, and J. C. Machado1
1Federal University of Rio de Janeiro, Rio de Janeiro, Brazil

P – Fri - A - 149
Evaluation of Circumferential and Longitudinal Strain in a Rabbit Fetal Heart Model Using 4D Echocardiography
V. V. Apte1, A. Han1, L. Tan1, M. Zhu1, M. Asfar1, D. Saah1, and Z. Zhang1
1Oregon Health & Science University, Portland, OR; 2OHSU - Oregon Graduate Institute, Portland, OR

P – Fri - A - 150
The Use of Ultrasound Imaging to Detect the Multi-Function of Muscle Compartments for Upper Extremity Prosthetic Control
H. Zafar1, N. Arklahagi1, K. McDonal1, H. Rangwala1, and S. Sikdar1
1George Mason University, Fairfax, VA

P – Fri - A - 151
Quantitative Measurement of Cerebrospinal Fluid Flow Rate in Ventriculoperitoneal Shunts using Ultrasound Imaging and Contrast Agents
R. Hartman1, S. Agliavoyd, D. Fox1, and S. Emland1
1University of Texas at Austin, Austin, TX; 2University of Texas at Austin, Austin, TX

P – Fri - A - 152
Development of Shaped Solid Ultrasound Contrast Agents
R. Conde1, H. Saffari1, A. Kenneth1, K. Peterson1, G. Gleich1, and L. Pease III1
1University of Utah, Salt Lake City, UT
Track: Cellular and Molecular Bioengineering

Cell Motility

P – Fri - A - 153
Engineered Tissues to Quantify the Biology of Tumor Spread
L. BARNEY, E. DANDEL, AND S. PEYTON
University of Massachusetts, Amherst, Amherst, MA

P – Fri - A - 154
Alteration of Migration Pattern for Mechanics-Induced Colon Cancer Metastasis
X. TANG, Y. JUNG, J. HSU, L. GUAN, AND T. SAIF
University of Illinois at Urbana-Champaign, Urbana, IL

P – Fri - A - 155
Bi-Directional Microfluidic Devices for Leukocyte Migration Study
J. YAN, L. BONESCHANSKER, E. WONG, D. M. BRISCE, AND D. IRIMIA
Massachusetts General Hospital, Boston, MA; Harvard Medical School, Boston; Boston Children’s Hospital, Boston, MA

P – Fri - A - 156
Three-dimensional Computational Model for the Active Deformation and Migration of Circulating Cells
H. LIAO AND D. B. KHOSMATULLIN
Tulane University, New Orleans, LA

P – Fri - A - 157
Incorporating Filopodia Dynamics, Focal Adhesion Dynamics, Cytoskeleton Remodeling, and Degradation of Extracellular Matrix for Predicting Tip Cell Migration in Angiogenesis
M.-C. KIM, P. CHEN, R. KAMMI, AND H. ASADA
Singapore-MIT Alliance for Research & Technology, Singapore, Singapore; National University of Singapore, Singapore; Massachusetts Institute of Technology, Cambridge, MA

P – Fri - A - 158
Directional Motility of Cell Migration on Tubular Conduits: Experiment and Simulation
M.-C. KIM, Y.-H. KIM, D. NEAL, R. KAMMI, AND H. ASADA
Singapore-MIT Alliance for Research & Technology, Singapore, Singapore; Massachusetts Institute of Technology, Cambridge, MA

P – Fri - A - 159
Study of Axon-Guidance Interactions in Controlled Microfluidic Environments
S. MOORJANI, N. BHATTACHARJEE, AND A. FOLCH
University of Washington, Seattle, WA

P – Fri - A - 160
Physical Role of Cell-Cell Contact in Collective Cell Migration
J. MARCHAND, P.-H. WU, M.-H. LEE, AND D. WIRTZ
Johns Hopkins University, Baltimore, MD

P – Fri - A - 161
Collective Migration of a Complex Tissue Studied with “3D Tissue Etching”
M. HAZAR, Y. KIM, W. C. MESSNER, P. R. LE Duc, AND L. A. DAVISON
Carnegie Mellon University, Pittsburgh, PA; Massachusetts Institute of Technology, Cambridge, MA; Tufts University, Medford, MA; University of Pittsburgh, Pittsburgh, PA

P – Fri - A - 162
A Simple and Rapid Method for Neutrophil Enrichment and Chemotaxis Analysis
J. WU AND F. LIN
University of Manitoba, Winnipeg, MB, Canada

P – Fri - A - 163
Elucidating Mechanisms Behind Cell Migration at Polystyrene-hydrogel Interfaces
M-P. PEBWORTH, J. CARLISLE, AND P. ASURI
Santa Clara University, Santa Clara, CA

P – Fri - A - 164
Quantum Dots for the Targeting of HGF Binding Sites and Downstream Targets in Cancer Chemotaxis
S. MCCUTCHEON AND M. VAZQUEZ
The City College of New York, New York, NY

P – Fri - A - 165
The Arp2/3 Complex Mediates Multi-generation Dendritic Protrusions for Efficient Three-dimensional Cancer Cell Migration
A. Giri, J. S. Mirzadeh, N. Trenton, H. Jayatilaka, G. D. Longmore, AND D. Wirtz
Chemical and Biomolecular Engineering, Johns Hopkins University, Baltimore, MD; Johns Hopkins Physical Sciences - Oncology Center, Baltimore, MD; Departments of Medicine and Cell Biology and Physiology and BRIGHT Institute, Washington University, St. Louis, MO

P – Fri - A - 166
Oscillatory Behavior of Neutrophils in Opposing Chemoattractant Gradients
M. BYRNE, Y. KIMURA, A. KAPOOR, F. WANG, P. J. KENIS, AND C. V. RAAD
University of Illinois at Urbana-Champaign, Urbana, IL

P – Fri - A - 167
The Interplay of Duro- and Hapto-taxis in Regulating Stem Cell State
J. H. WEN, J. KARPIAK, A. ALMUTAIRI, AND A. J. ENGLEMANN
UC San Diego, La Jolla, CA

P – Fri - A - 168
Integrin 1 and MT1-MMP Govern Cell Migration in 3D Matrices via ROCK Mediated ERK Activation
J. S. MAFFEI, J. SRIVASTAVA, B. FALLICA, AND M. ZAMAN
Boston University, Boston, MA; University of Texas, Austin, TX

P – Fri - A - 169
A User-friendly Microfluidic Device for Examining Growth Cone Dynamics
A. M. TAYLOR, N. DESOUSA, A. KHAN, AND S. GUPTON
UNC-Chapel Hill, Chapel Hill, NC, NCSU, Raleigh, NC

P – Fri - A - 170
The Influence of Alignment and Suspended Fiber Structural Stiffness on Cancer Cell Migration
P. SHARMA, S. BHATIA, C. HUGHES, AND A. S. NAIN
Virginia Tech, Blacksburg, VA

P – Fri - A - 171
Controlling Bacterial Motility by Quorum Sensing Signal Generation and Transduction
H-C. WU, C-Y. TSAO, D. N. QUAN, K. CARTER, J. TERRELL, AND W. BENTLEY
Institute for Bioscience and Biotechnology Research, University of Maryland, College Park, MD

Track: Cellular and Molecular Bioengineering

Cellular Bioengineering

P – Fri - A - 172
Cell-Surface Affinity - a Metric to Characterize Cell Surface Preference – Adjusted for Cell Specific Response to Protein Patterns
S. G. ROCOUT, G. THOMPSON-STECKEL, J. P. CORREIA, T. E. KENNEDY, AND D. JUNCKER
McGill University, Montreal, QC, Canada
P – Fri - A - 173
Fibroblast Growth Factor-2 Binding to Cell Surface Heparan Sulfate Proteoglycans Increases in Flow Adapted Endothelial Cells
N. Patel, T. Cai, and A. M. Clyne
*Drexel University, Philadelphia, PA

P – Fri - A - 174
Oil Biosynthesis in Microalgae Chlamydomonas reinhardtii
A. Clavel1, C. Xu1, and C. Yan1
Stony Brook University, Stony Brook, NY, Brookhaven National Laboratory, Upton, NY

P – Fri - A - 175
Shear Mediated Monocyte Pro-inflammatory Response to Chlamydia pneumoniae Infection
S. J. Evan1, S. F. Daboll, and A. K. Ramanathan
1University of Texas at San Antonio, San Antonio, TX

P – Fri - A - 176
Anchoring on an Erythroblastic Island
J. Jang1, T. Ulyanova2, K. Gupta2, R. Lucier2, K. Nami2, D-W. Choi2, T. Papawannopoulou2, and D.H. Kim2
1POSTECH, Pohang, Korea, Democratic People’s Republic of; 2University of Washington, Seattle, WA

P – Fri - A - 177
CANCELLLED BY AUTHOR

P – Fri - A - 178
Analysis of CRISPR-Cas Nuclease Specificity, Off-target Cleavage and Mutagenesis
T. J. Craddock1, E. J. Fine1, and G. Bao1
1Georgia Institute of Technology and Emory University, Atlanta, GA

P – Fri - A - 179
PKU Enzyme Replacement Through MSC Based Therapy
S. A. Knupp1 and Q. Xu1
1Tufts University, Medford, MA

P – Fri - A - 180
Engineering Robust Control Over Two-component System Phosphotransfer Using Synthetic Protein Scaffolds and an Engineered Allosteric Histidine Kinase Switch
W. R. Whittaker1, S. A. Davis1, A. P. Arkin1, and J. E. Dubber1
1UC Berkeley, Berkeley, CA, Lawrence Berkeley National Laboratory, Berkeley, CA

Track: Drug Delivery

Drug Delivery in Tissue Engineering

P – Fri - A - 181
Experimental Release and Analytical Modeling of Release from Degradable Poly(ethylene glycol) Microgels
J. Stukel1, S. Thompson, L. Simon, and R. K. Wiltis1
1The University of Akron, Akron, OH, 2New Jersey Institute of Technology, Newark, NJ

P – Fri - A - 182
Microscopic Transport of Bile Salt Micelles in Gastrointestinal Mucus
H. M. Yildiz1, D. Rannetberger Bruenschwig, and R. L. Caillet1
1Northeastern University, Boston, MA

P – Fri - A - 183
Sustained Release of Novel Anti-biofilm Agents from a Poly (2-hydroxyethyl methacrylate) Porous Scaffolds for Implantable Surgery
H. Ma1, L. Zhang1, and J. D. Bryers1
1University of Washington, Seattle, WA

P – Fri - A - 184
Shell-type Multilayered Hydrogel Scaffolds with Heterogeneous Porosity
G. Ahn1, J-Y. Moon1, Y. Kim1, and D. Lee1
1Chung-Ang University, Seoul, Korea, Republic of

P – Fri - A - 185
Preliminary Study of PLGA Drug-delivery Nerve Conducts for Potential Applications in Nerve Regeneration
K M Lin1, B. Gale1, H. Sani1, J. Shea1, W. Sanders1, C. M. Terry1, and J. Agarwal1
1University of Utah, Salt Lake City, UT

P – Fri - A - 186
Antibacterial Nanofibrous Mesh: A Wound Healing Device for Complex Wound Treatment
Z. Xie1, C. B. Paras1, P. Punnakittikashem1, H. Weng1, L-C. Su1, K. Yu1, L. Tang1, J. Yang1, and K. T. Nguyen1
1University of Texas at Arlington, Arlington, TX, 2Pennsylvania State University, University Park, PA, 3University of Texas Southwestern Medical Center, Dallas, TX

P – Fri - A - 187
Long Term Local Release of CCL7 for the Treatment of Urinary Incontinence
E. Rivera-Delgado1, N. X. Wang1, Z. Sadeghi1, M. Kaviran1, A. Huiz1, and H. A. von Recum1
1Case Western Reserve University, Cleveland, OH

P – Fri - A - 188
Novel Bioreactor for 3D Series Perfusion Culture and Drug Testing Studies
N. L. Bay1, D. Kaplan1, and Q. Xu1
1Tufts University, Medford, MA

P – Fri - A - 189
The Effects of PEG Hydrogel Crosslinking Mechanism and Crosslinking Density on Protein Release
S. Lee1, X. Tong1, and F. Yang1
1Stanford University, Stanford, CA

P – Fri - A - 190
Investigation of the Protecting Effect of a Polymeric Carrier on Protein Activity in Electrostim Meshes
A. R. Whittington1, S. Samavedi1, C. J. Fleming1, S. Inkrote1, and A. S. Goldstein1
1Virginia Tech, Blacksburg, VA

P – Fri - A - 191
Biodegradable Polymeric Particles Deliver Peptides for Long-Term Inhibition of Angiogenesis in a Neovascular Age Related Macular Degeneration Mouse Model
R. B. Shimizu1, M. Ohnaka1, A. Miki2, N. B. Panedy1, R. Formica1, J. E. Koskimaki1, J. Kim1, A. S. Popel1, P. A. Campochiaro1, and J. J. Green1
1Johns Hopkins School of Medicine, Baltimore, MD

P – Fri - A - 192
Controlled Release of Glial Cell-Derived Neurotrophic Factor From Biodegradable Poly(ε-caprolactone) Microspheres
A. Aaob1, N. Khadem Mirtaram1, and S. M. Willerth1
1University of Victoria, Victoria, BC, Canada

P – Fri - A - 193
Quantification of the Transport of Live Autonomous Drug Particles (DrugBots) in Tumor Spheroids
M. A. Traore1, A. Sahari1, and B. Behkam1
1Virginia Tech, Blacksburg, VA

P – Fri - A - 194
Optimal Assembly of Permanent Magnets to Obtain Maximum Magnetic Force for Magnetic Drug Targeting In Vivo
J. Sud1, N. Landazuri1, S. Tong1, H. Jo1, G. Bao1, R. Taylor2, and D. Giddens1
1Georgia Institute of Technology, Atlanta, GA, 2Emory university, Atlanta, GA, 3Emory University, Atlanta, GA
A Novel Arborizing Fiberoptic Microneedle Device (FMD) Catheter for CED in the Brain
R. T. ANDRIKIAN1, R. L. HOOD2, J. ROSSMEISLI3, and C. G. NYLANDER1
1Virginia Tech, Blacksburg, VA, 2Virginia-Maryland Regional College of Veterinary Medicine, Blacksburg, VA

DNA-based Transcription Factor Nrf2 Delivery for Acetaminophen Induced Liver Failure
K. LEE1, X. FENG1, M. RAFI1, R. E. ALEI1, R. TANG1, N. LINGAMPALLI1, and N. MURTHY1
1University of California, Berkeley, Berkeley, CA

Delivery of Antitumor Agent Luconathone into U251 Glioblastoma Multiforme Using Oxidized Graphene Nanoribbons
C. A. SUHRLAND1, S. M. CHOWDHURY1, M. NAND2, and B. SITHARAMAN1
1SUNY Stony Brook, Stony Brook, NY

Fiberoptic Microneedle Device for Co-Delivery of Single-Walled Carbon Nanohorns and Laser Energy for Targeted Photothermal Heating of Ex Vivo Porcine Bladder
C. NYLANDER1, E. BRANDON1, J. WHITNEY1, and J. ROBERTSON1
1Virginia Polytechnic Institute and State University, Blacksburg, VA

Track: Drug Delivery

Novel Materials and Self Assembly

Tunable Fatty Acid Based Biomaterials Enable Local and Controlled Drug Delivery
N. ARZI1, M. MIER1, A. FREMANTLE1, K. FAUCHER3, S. CONROY1, D. D. D. ALE15, E. EDLAMAN1, and P. MARTAKUS1
1MIT, HST, Cambridge, 2Brimingham Women’s Hospital, Harvard Medical School, Boston, MA, 3Institut Quimic de Sarria, Universitat Ramon Llull, Barcelona, Spain, 4MIT, HST, Cambridge, MA, 5Ont Braude College, Karmiel, Israel, 6Atrium Medical, Hudson, NH, 7Atrium Medical, Hudson

Modular Synthetic Glycopolymers for Cell Targeting and Drug Delivery
M. MANGANELLO1, E-H. SONG1, A. CONVERTINE1, P. STAYTON1, and D. M. RATNER1
1University of Washington, Seattle, WA

Dendrimers Built of DNA, Nucleodendrimers, Provide Intracellular Delivery and Effects of siRNA
V. MAE1 and S. MURO1
1University of Maryland College Park, College Park, MD

Biopolymer-mediated Drug/Gene Delivery
W. Kim1
1POSTECH, Pohang, Korea, Republic of

Hyperbranched Polyglycerols Coated Polyactic Acid Nanoparticles for Drug Delivery
Y. DENG1, J. SALCUIR-CAWTER1, J. ANDREJECSK1, C. HOMIES1, Y-E. SEO1, J. ZHANG1, N. DUONG3, and M. SALTMAN1
1Virginia Tech, Blacksburg, VA, 2University of Texas at Arlington, Arlington, TX, 3CFO Research Corporation, Huntsville, AL, 4University of Texas Southwestern Medical Center, Dallas, TX

Detoxification of Gold Nanorods for Improved Cytocompatibility and Biofunctionalization
A. P. DHANJALI
1University of Texas at San Antonio, San Antonio, TX

A Novel Encapsulation Method for Ferritin Nanocage
A. E. LORENZ1
1MIT, Cambridge, MA

P = Poster Session
OP = Oral Presentation
**Track: Drug Delivery**

**Targeted Drug Delivery**

**P – Fri - A - 215**

A Systems Approach to Engineering Ti-Conjugated Drug-Encapsulated Nanoparticles

R. Y. CHIU1, T. TSUJI1, S. J. WANG1, J. WANG1, A. B. MASON2, and D. T. KAMEI1

1University of California, Los Angeles, Los Angeles, CA, 2University of Nagoya, Nagoya, Japan

**P – Fri - A - 216**

Inhibiting Metastatic Breast Cancer Cell Migration via Targeted pH-triggered siRNA Delivery and Chemokine Axis Blockade

P. GUO1, D. AUGUSTE2, and J-O. YOO3

1Children Hospital Boston, Boston, MA, 2City College of New York, New York, NY, 3Chungbuk National University, Cheongju, Korea, Republic of Korea

**P – Fri - A - 217**

Synthesis and Characterization of pH-sensitive Hydrogel Carriers for Oral Vaccine Delivery

L. A. SHARPE1, M. DURAN-LOBATO2, and N. A. PEPPAS1

1University of Texas at Austin, Austin, TX, 2University of Seville, Seville, Spain

**P – Fri - A - 218**

Delivery Vectors for Oral Protein Therapeutics: Characterization and Cellular Transport

A. M. DAILY1 and N. PEPPAS1

1University of Texas at Austin, Austin, TX

**P – Fri - A - 219**

An Anti-obesity, Apoptosis-inducing ScFv Fusion Protein Targeting Mature Adipocytes

Y. ROYET1, H. HARPER2, N. RINALDIN, and W. FARN2

1University of Oklahoma, Norman, OK, 2University of Oklahoma, Norman

**P – Fri - A - 220**

Targeted Inhalable Pegylated Lipidic Nanomicelles Containing Fasudil: Formulation and Characterization

N. GUPTA1, B. PATEL1, A. ABHAR1, and P. AHSAN1

1Texas Tech University Health Sciences Center, Amarillo, TX

**P – Fri - A - 221**

Drug Delivery via MR-Guided Focused Ultrasound Induced Hyperthermia in a Pancreatic Cancer Mouse Model

N. FARR1, Y. N. WANG1, S. D. ANDREAS1, F. STARR1, D. LEE2, and J. H. WANG1

1University of Washington, Seattle, WA

**P – Fri - A - 222**

Interaction and Transport of ICAM-1-Targeted Nanocarriers with Components of the BBB and the Brain

J. HSU1, J. RAPPAPORT2, and S. MURUGU3

1University of Maryland, College Park, College Park, MD, 2Institute for Biosciences and Biotechnology Research, College Park, MD

**P – Fri - A - 223**

Targeting of Polymer Therapeutics to Sites of Bone Resorption via Incorporation of Homing Peptide

C. SCHMITT1 and D. S. BENOIT1

1University of Rochester, Rochester, NY

**P – Fri - A - 224**

Evaluation of Pressure Dependent Oxygen Diffusion in an Ex-vivo Tissue Model

A. B. ALLAVALLA1, P. RAO2, G. SELWADURAY2, and J. MANDRUSOV2

1San Jose State University, San Jose, CA

**Track: Drug Delivery**

**Drug Delivery**

**P – Fri - A - 225**

PDT Drug Delivery in Brain Tumors using Biocompatible Micelle/Liposome Based Carriers

S. K. DIXIT1, K. J. MILLER1, P. ZHANG2, M. KENNEY2, and A-M. BROOME1

1Medical University of South Carolina, Charleston, SC, 2Case Western Reserve University, Cleveland, OH

**P – Fri - A - 226**

Assessment of Toxic Properties of Carbon Nanotubes using ADMET Predictor and Effects of MWNT’s on Bacterial Cells

P. NARUL1 and P. PATRA1

1University of Bridgeport, Bridgeport, CT

**P – Fri - A - 227**

A Novel Graphene Nanoribbon Based Targeted Drug Delivery System For Human Papilloma Virus Mediated Cancers

S. MULLICK CHOWDHURY1 and B. SITHARAMAN1

1Stony Brook University, Stony Brook, NY

**P – Fri - A - 228**

Lipid-Coated Biodegradable Nanoparticles for Delivery of Curcumin to Brain

S. MAJD1 and C.F. KUD1

1Penn State University, University Park, PA
**Track: Neural Engineering**

**Brain Injury**

**P – Fri - A - 235**  
Identifying the Shear Material Properties of Brain using Analytical and Finite Element Approaches  
C. D. UNIKROU

**P – Fri - A - 236**  
Glial Activation is Associated with Chronic Behavioral Deficits Following Blast Neurotrauma  
S. SAGA1, W. HUBBARD1, C. HALL1, AND P. VANDEVORD1,  
1Virginia Polytechnic and State University, Blacksburg, VA, 2Veterans Affairs Medical Center, Salem, VA

**P – Fri - A - 237**  
Oxidative Stress and Glial Response Could Lead to Anxiety Following Varied Levels of Blast Overpressure  
W. B. HUBBARD1, S. SAGA1, E. ERIFEJ1, AND P. VANDEVORD1,  
1Virginia Tech, Blacksburg, VA, 2Veterans Affairs Medical Center, Salem, VA

**P – Fri - A - 238**  
Antibacterial Properties of Collagen Scaffolds with Tunable Mechanical Properties  
C. KEELE1, K. CRAWFORD1, M. JIMENEZ1, AND E. ORWIN1  
1Harvey Mudd College, Claremont, CA

**P – Fri - A - 239**  
Starting Stimuli Elicit Fast Hand Flexion and Extension in Stroke Survivors: Implications for Neural Control and Therapy  
C. HONEYCU1, U. A. TRESP2, AND E. J. PERREAULT1,  
1Rehabilitation Institute of Chicago, Chicago, IL, 2Institute of Biomechanics, ETH Zurich, Zurich, Switzerland, 3Northwestern University, Chicago, IL

**P – Fri - A - 240**  
The Impact of Shoulder Abduction Loading on the Ability to Grasp and Release Following Stroke  
Y. LAN1, J. YAO1, AND J. DEWALD1  
1Northwestern University, Chicago, IL

**P – Fri - A - 241**  
Development of a Traumatic Brain Injury Bioreactor  
Z. HELLER1, J. WYATT1, AND J. WOLCHOK1  
1University of Arkansas, Fayetteville, AR

**P – Fri - A - 242**  
Do Primary Blast-shock Waves Cause Mild TBI? Biomechanical Response of Rats Under a Wide Range of Blast Overpressures  
N. CHANDRA1, M. SKOTAK1, AND F. WANG1  
1University of Nebraska-Lincoln, Lincoln, NE

**P – Fri - A - 243**  
Cellular Mechanisms of Shock Wave Generated Blast Neurotrauma  
E. S. ERIFEJ1, C. E. HAMPTON1, C. N. TORPPE1, B. A. RZIGALINSKI1, AND P. J. VANDEVORD1  
1Virginia Tech, Blacksburg, VA, 2Edward Via College of Osteopathic Medicine, Blacksburg, VA

**Track: Neural Engineering**

**Brain-computer Interfaces**

**P – Fri - A - 244**  
Behavioral Parametric Experiments of Waveform Duration, Direction, Asymmetry and Phase Delay in Sensory Intracortical Microstimulation  
A. KOVANISI1 AND K. OTTO2  
1Purdue University, Indianapolis, IN, 2Purdue University, West Lafayette, IN

**P – Fri - A - 245**  
Conducting Polymer Electrodes for EEG Application  
P. LELEUX1, 2, C. BÉNARD1, J.-M. BADIER1, T. HERVE1, P. CHAUVEAU2, AND G. G. MALLARIAS1  
1École des Mines de Saint Etienne, Gardanne, France, Metropolitan, 2INSERM, Marseille cedex 15, France, Metropolitan, 3Microvitec Technologies, Gardanne, France, Metropolitan

**P – Fri - A - 246**  
Biohybrid Neural Tissue Engineered Constructs for Electrical Interface with Peripheral Nerve  
L. STRUZYN1, J. WOLF2, AND D. K. CULLEN1  
1University of Pennsylvania, Philadelphia, PA

**P – Fri - A - 247**  
Histological Correlates to Functionality in 4x4 Utah Electrode Arrays in Rat Cortex  
M. B. CHRISTENSEN1, N. F. NOLTA1, J. L. SKOUSEN1, AND P. A. TRESCO1  
1University of Utah, Salt Lake City, UT

**P – Fri - A - 248**  
Flexible Microprobes Coated with a Fast Degrading Polymer for Chronic Neuronal Signal Acquisition  
M.-C. LO1, S. SINGH1, S. WANG1, J. D. ZAHN1, D. I. SHREIBER1, AND J. KOHN1  
1Rutgers, The State University of New Jersey, Piscataway, NJ

**P – Fri - A - 249**  
Self-regulation of Anterior Insula Cortex in Chronic Smokers Using Real-time fMRI  
M. RAN1, S. RUIZ2, A. MUELECKI, K. BUYUKTURKOGLU1, J. DALBONI DA ROCHA1, S. ECK1, A. BATRA1, N. BIBLAUMER1, AND R. SITARAM1  
1Institute of Med. Psychology & Behavioral Neurobiology, University of Tuebingen, Tuebingen, Germany, 2Pontificia Universidad Catolica de Chile, Santiago, Chile, 3Department of Psychiatry and Psychotherapy, University of Tuebingen, Tuebingen, Germany, 4Institute of Med. Psychology & Behavioral Neurobiology, University of Tuebingen, Tuebingen, Germany, 5Department of Biomedical Engineering, University of Florida, Gainesville, FL, 6Institute of medical psychology and Behavioural neurobiology, Tuebingen University, Tuebingen, Germany, 7Department of Biomedical Engineering, University of Florida, Gainesville, FL

**P – Fri - A - 250**  
EEG Helmet for Measuring Evoked Potential of Visual Area Based on Dry Capacitively-coupled Electrodes  
J. KIM1, H. BAEK1, H. LEE1, Y. LIM2, AND K. PARK1  
1Seoul National University, Seoul, Korea, Republic of, 2Sangji University, Wonju, Korea, Republic of

**Neural Engineering**

**P – Fri - A - 251**  
Carbon Nanotube Fibers Microelectrodes for Neural Recording and Stimulation  
F. VITALE1, C. KEMERE1, AND M. PASQUALI1  
1Rice University, Houston, TX

**P – Fri - A - 252**  
Aligned RGD-MeHA Nanofibers: Adhesive and Topographical Cues for Improving Neural Regeneration  
M. WROBEL1 AND H. SUNDAVARACHA1  
1Wayne State University, Detroit, MI
P – Fri - A - 253
The Effect of Peptoids on All Aggregation and NF- KB Activation in Alzheimer’s Disease
K. MOORE1, L. M. WOLF1, and M. MOSS1
1University of South Carolina, Columbia, SC

P – Fri - A - 254
Classification of Hand and Finger Motions using EMG from the Extrinsic and Intrinsic Hand Muscles
A. ADEWUYI1, L. HARGROVE1,2, and T. KUIKIN1,2
1Northwestern University, Chicago, IL, 2Rehabilitation Institute of Chicago, Chicago, IL

Track: Tissue Engineering

Biomimetics for Tissue Engineering

P – Fri - A - 255
Synergistically Providing Cyclic Mechanical Stimulation and Local TGF-$
\beta$ Delivery Enhances Mechanical Properties and Uniformity of the Fibrin Vascular Constructs
M-S. LIANG1, M. KOUBATAN1, D. D. SWARTZ2, and S. T. ANDREADIS3
1State University of New York at Buffalo, Buffalo, NY

P – Fri - A - 256
Cyclic Chemografts Mimicking the Evolution of Chemografts in Living Tissues
C. A. REINHART-KING1 and S. BAJPAI1
Cornell University, Ithaca, NY

P – Fri - A - 257
Characterization of Localized Antithrombotics for the Treatment of Restenosis
R. A. SCOTT1 and A. PANITCH1
Purdue University, West Lafayette, IN

P – Fri - A - 258
Effects of Mechanical Stimulation on Proliferation, Senescence and Suppression of Osteogenesis in hMSCs
Y. KANG1, S. PARK1, J-S. HYUN1, M-J. OH1, and J-W. SHIN1,2
1Department of Biomedical Engineering, Inje University, Gumi, Korea, Republic of; 2First Research Team Inst. of Aged Life Redesign Cardiovascular and Metabolic Disease Center/ UHRC, Inje University, Gumi, Korea, Republic of

P – Fri - A - 259
In Vitro Citotoxicity Evaluation of PCL Fibers Produced by Forcespinning
G. R. PEREA1, A. A. RODRIGUES2, N. A. BATISTA2, W. D. BELANGERO2, C. C. ZAVAGLIA2, and M. A. D`AVILA1
1UNICAMP Campinas, Brazil

P – Fri - A - 260
Functional Analysis of Cell Aggregation Induction Proline Containing Periodic Peptides
Y. HIRANO1 and Y. FUTAKI1
1Kansai University, Suita, Japan

P – Fri - A - 261
How Curvature is Perceived by a Cell as a Three Dimensional Cure?
J. KIM1, C. YANG1, and J. WONG1
1Boston University, Boston, MA

P – Fri - A - 262
Biomimetic Polyurea for Substantial Nerve Regeneration
D. YUN1, A. FAMILI1, P. JENKINS1, and D. PARK1
1UC Denver/IAMC, Aurora, CO

P – Fri - A - 263
The Effects of Mechanical Stimulation and Neighboring Cells to Mesenchymal Stem Cell Migration
M. V. GARCIA1, S. KIM2, Y. KANG3, J-S. HYUN4, M-J. OH5, and J-W. SHIN6
1Department of Health Science and Technology, Inje University, Gumi, Korea, Republic of; 2Engineering Ceramic Research Group, Functional Materials Division, KIMS, Changwon, Korea, Republic of; 3Department of Biomedical Engineering, Inje University, Gumi, Korea, Republic of; 4First Research Team Inst. of Aged Life Redesign/ Cardiovascular and Metabolic Disease Center/ UHRC, Inje University, Gumi, Korea, Republic of

P – Fri - A - 264
Layer by Layer Assembly of Uniaxially Aligned Biodegradable Nanofibers for Submillimeter Thick Scaffold Towards Guided Tissue Engineering
P-F. JAO1, S-P. FANG1, W. U. HASANAT1, and Y-K. YOON1
1University of Florida, Gainesville, FL

P – Fri - A - 265
Elucidating the Effects of Cytokine Signaling on Hepatic Function in vitro Tissue Mimics
L. VU1 and P. RAJAGOPALAN1,2
1Department of Chemical Engineering Virginia Tech, Blacksburg, VA, 2School of Biomedical Engineering and Sciences Virginia Tech, Blacksburg, VA

P – Fri - A - 266
Cartilage Regeneration using Chitosan-based Anisotropic Hydrogels
K. J. WALKER1 and S. MASON2
1Oklahoma State University, Stillwater, OK

P – Fri - A - 267
Biomimetic Hydrogel Promotes Mesenchymal Stem Cell Osteogenesis for Cartilage Engineering
Y. YUAN1 and F. CHI1
1Eye Ear Nose and Throat Hospital, Fudan University, Shanghai, China, People’s Republic of

P – Fri - A - 268
Hybrid Photoactive-enzymatic Platform for Heterogeneous Hydrogel Patterning
D. R. GRIFFIN1, G. ACOSTA1, J. MACK1, A. SOON1, J. BORRAGO1, V. OSHITA1, and T. SEGURA1
1UC Los Angeles, Los Angeles, CA

Track: Tissue Engineering

Directing Stem Cell Differentiation

P – Fri - A - 269
Osteogenic Differentiation of hMSCs with PEG-Melanin LIKE Gels
C. T. DRINNAN1, A. MEHTA1, and O. Z. FISHER1
1Temple University, Philadelphia, PA

P – Fri - A - 270
The Effect of Two Dimensional Carbon Nanoparticles on the Viability and Differentiation of Adipose Derived Stem Cells
Y. TALLUDAR1, J. T. RASHKOW1, G. LALWANI1, and B. SITHARAMAN1
1State University of New York at Stony Brook, Stony Brook, NY

P – Fri - A - 271
Non-Viral Gene Delivery To Drive Nerve Cell-like Differentiation Of Umbilical Cord Cells For Inner Ear Hair Cell Regeneration
A. J. MELLOTT1, H. SHINOGL1, D. MOORE1, H. STAECCKER1, and M. DETAMORE1
1University of Kansas, Lawrence, KS, 2University of Kansas Medical Center, Kansas City, KS

P – Fri - A - 272
Optimization of Adipocyte Differentiation Culture Media and Development of an in Vitro Type III Diabetic Environment
D. M. MINTSER1, K. G. MARRA1, and J. P. RUBIN1
1University of Pittsburgh, Pittsburgh, PA
Chondrogenesis in a Novel Centrifugal Bioreactor
Synergistic
P – Fri - A -  276
1
N. HAQ-SIDDIO1 and E. LEE1
1New Jersey Institute of Technology, Newark, NJ
A 3D Microfluidic Gel System for Stem Cell Derived Endothelial Cells
L. WONG1, D. GLASER1, and K. MCCLOSKEY1
The University of Florida, Gainesville, FL
L. W. Examining the Effect of Stiffness on Vascular Differentiation
Synergistic Influencces of Mechanical and Bioactive Factors on Chondrogenesis in a Novel Centrifugal Bioreactor
P – Fri - A -  275
A. NAZEMPOUR1, C. R. QUINSENBERRY1, H. KIM2, N. ABU-LAIL1, V. IDONE2, and B. VAIN-WAL1
1Washington State University, Pullman, WA, 2Regeneron Pharmaceutical Corporation, Tarrytown, NY
Collagen-Based Hydrogels Direct Spinal Progenitor Cell Differentiation Toward Oligodendrocytes
S. A. GEISSLER1, Z. Z. KHANG1, and C. E. SCHMIDT1,2
1The University of Texas, Austin, Austin, TX, 2University of Florida, Gainesville, FL
3D Expansion of Mesenchymal Stromal Cells Preserves Progenitor Properties Independent of Scaffold
A. I. HOCH1,2, D. J. WENDT2, J. K. LEACH2,3, and I. MARTIN2
1University of California, Davis, Davis, CA, 2University Hospital Basel, Basel, Switzerland, 3UCDMC, Sacramento, CA
Nanopatterned Hyaluronan Hydrogels Enhance Chondrogenic Differentiation in Dental Pulp Stem Cells
C. NEMETH1, K. JANEBOODIN1,2, A. YUAN1, M. REYES1, and D-H. KIM1
1University of Washington, Seattle, WA, 2Mahidol University, Bangkok, Thailand
Modulation of RHAMM Protein Function Alters Mesenchymal Tissue Differentiation
B. BAHRAMI1, C. TOELG2, M. J. BISSELL1, and E. A. TURLEY2
1Lawrence Berkeley National Laboratory, Berkeley, CA, 2London Health Sciences Centre and Western University, London, ON, Canada
Effect of Expansion Conditions on Stem Cell Marker Expression and Multipotency of Amnionic Fluid-derived Stem Cells
J. PETSOE CONNELL1, E. D. AUGUSTINI1, S. K. CHENG2, R. RUANO3,4, and J. G. JACOT5,6
1Rice University, Houston, TX, 2Baylor College of Medicine, Houston, TX, 3Texas Children’s Hospital, Houston, TX
Stage- and Cell Line-Specific Optimizations for Efficient Derivation of Human and Mouse Endothelial Cells
D. E. GLASER1, W. S. TURNER1, A. B. BURNS1, and K. E. MCCLOSKEY1
1University of California, Merced, Merced, CA
Enhancing hMSC Attachment to Fibrin Microthreads
A. E. CUNHA1, K. J. HANSEN2, I. CICH2, and G. R. GAUDETTE2
1Quinsigamond Community College, Worcester, MA, 2Worcester Polytechnic Institute, Worcester, MA
Analysis of Cell Signaling

P – Fri - B - 1
A Systems Pharmacology Approach to Understanding Differential Responsiveness of Melanoma Cancer Cells to BRAF Inhibition
M. FALLAH-I-SICHANI1, N. J. MOERKE2, A. DASTUR3, C. H. BEN5, and P. K. SORG3
1Harvard Medical School, Boston, MA, 2Massachusetts General Hospital Cancer Center, Charlestown, MA

P – Fri - B - 2
Computational Model of IGF1R Signaling Dynamics in Ovarian Cancer Cells
D. TAN1 and P. K. KREGER1
1University of Wisconsin Madison, Madison, WI

Genomics, Transcriptomics and Proteomics

P – Fri - B - 3
Single Cell Gene Expression Study of Human Peripheral CD8+ T Cells Recognizing Self and Foreign Antigens
N. JIANG1, Y. WONG2, B. KIDD2, S. QUAKE2, and M. DAVIS2
1University of Texas at Austin, AUSTIN, TX, 2Stanford University, Stanford, CA

P – Fri - B - 4
Similarity Measures for Analyzing Head and Neck Cancer Gene Expression Data
C. D. KADDI1 and M. D. WANG1
1Georgia Institute of Technology, Atlanta, GA

P – Fri - B - 5
The Effect of Genome Annotation Complexity on RNA-Seq Gene Expression Estimation
P.Y. WU1, J. H. PHAI1, and M. D. WANG1
1Georgia Institute of Technology, Atlanta, GA

P – Fri - B - 6
Identifying Mechanisms of Drug Resistance in Pancreatic Cancer Using Gene Expression Analyses in a Multi-factor Design
E. M. BLAIS1, S. J. ADAM1, J. M. LINDHE1, T. E. NEVHIO1, T. W. BAUER1, J. T. PARSONS2, and J. A. PAPIN1
1University of Virginia, Charlottesville, VA

P – Fri - B - 7
Intimate Interplay Between TLR4 and Purinergic Receptor Signaling in Activated Macrophages
1University of California, San Diego, La Jolla, CA, 2University of California, San Diego, La Jolla, CA

P – Fri - B - 8
Reconstruction of Glycosylation Reaction Networks: Integration of Glycomics and Enzyme Data with Computer Models
G. LIU1 and S. NEELAMGHAH1
1State University of New York, Buffalo, NY

P – Fri - B - 9
SVD of Transcript Length Distributions Reveals Evolutionary Forces Globally Affecting GBM Metabolism
N. M. BERTAGNOLI1, J. A. DRAKE1, J. M. TENNESSEN1, and O. ALTER1
1Scientific Computing and Imaging (SCI) Institute, University of Utah, Salt Lake City, UT

P – Fri - B - 10
Network Optimization for Pathway Discovery in RNAi Screening
J. WILSON1, S. GOSLINE1, E. FRAENKEL1, and D. LAUFENBURGER1
1Massachusetts Institute of Technology, Cambridge, MA

P – Fri - B - 11
A Comparative Genomics Platform for Efficient Analysis of Genomic Context and Determining its Role in Genotype-to-Phenotype Associations
P. SEITZ1,2, D. MILLER1, and M. FACCIOTTI1,2
1UC Davis, Davis, CA, 2Genome Center, Davis, CA, 3New York University, New York, NY

P – Fri - B - 12
Comparison of Two Types of Barcodes Used for Multiple miRNAs Sequencing in the Ligation Sequencing Platform
J. TU1, L. WANG2, S. WANG3, and Z. LI1
1Southeast University, Nanjing, China, People’s Republic of, 2Peking University, Beijing, China, People’s Republic of

P – Fri - B - 13
Protein Identification in Macrophages
P. M. VARMAN1 and N. HAUERLAND2
1Duchesne Academy, Omaha, NE, 2University of Nebraska Medical Center, Omaha, NE

P – Fri - B - 14
Assessing Inter-study Variability and Resulting Effects on Robust Transcriptome-based Molecular Signatures
S. MA1,2, J. SUNG1, A. MAGIS1,2, Y. WANG1,2, D. GEMANI1, and N. PRICE1,2
1University of Illinois at Urbana-Champaign, Urbana, IL, 2Institute for Systems Biology, Seattle, WA, 3Pohang University of Science and Technology, Pohang, Korea, Republic of, 4Johns Hopkins University, Baltimore, MD

P – Fri - B - 15
Investigation of k-means Clustering for the Analysis of Mass Spectrometry Imaging Data
S. SARKARI1, C. D. KADDI1, and M. D. WANG1
1Georgia Institute of Technology, Atlanta, GA

P – Fri - B - 16
Identifying Signaling Networks and Therapeutic Targets in Glioblastoma Cancer Stem Cells
N. CAMPÌ, P. HOTHÒ, G. FOLÌ2, and A. WOLF-YADLIN1
1University of Washington, Seattle, WA, 2The Ben and Catherine Ivy Center for Advanced Brain Tumor Treatment, Swedois Neuroscience Institute, Seattle, WA

P – Fri - B - 17
Transcriptome Analysis of Multi-cellular Signaling in an Organotypic 3D Liver Model
R. R. RODRIGUES1, A. L. LARKIN1, L. T. VUI1, A. N. TEGGE1, T. M. MURATLI1, and P. RAJAGOPALAN1
1Virginia Tech, Blacksburg, VA

P – Fri - B - 18
Discovery of Common Sequences Absent in the Human Reference Genome Using Pooled Samples from Next Generation Sequencing
Y. LIU1, M. KOYUTURK1, S. MAXWELL1, M. XUANG1, M. VEGIL1, R. COOPER1, B. TAYO1, L. LI1, T. LAFRAMBOISE1, Z. WANG1, X. ZHU1, and M. CHANCE1
1Case Western Reserve University, Cleveland, OH, 2Iowa university, Chicago, IL

P – Fri - B - 19
What Do We Learn from Network-based Analyses of GWAS data?
M. AYATI1, Y. LIU1, M. R. CHANCE1, and M. KOYUTURK1
1Case Western Reserve University, Cleveland, OH
P – Fri - B - 20
The Biological Roles of Inconsistently-Expressed Genes
J. B. SHEPARD1
1University of Memphis, Memphis, TN

P – Fri - B - 21
An Integrated Transcriptomic and Lipidomic Study of Oxidized Lipid Activated RAW 264.7 Macrophages
M. R. MAURYA1, A. R. DINASARAPU2, S. GUPTA1, E. FAHY1, M. SUD1, and S. SUBRAMANI1
1University of California, San Diego, La Jolla, CA

P – Fri - B - 22
A Selected Reaction Monitoring Framework to Quantify Kinase Expression and Phosphorylation Stoichiometry
K. BECK1, M. BEREMAN1, M. MACCOSS1, and A. WOLF-YADLIN1
1University of Washington, Seattle, WA

P – Fri - B - 23
Gene Expression Analysis Highlights the Emergence of Substructures in the Developing Mouse Brain
V. MENON1, C. THOMPSON1, J. HOHMANN1, and M. HAWRYLYCZ1
1Allen Institute for Brain Science, Seattle, WA

P – Fri - B - 24
Discovery of Biologically Meaningful Modules Based on the Co-Expression Network from Multiple RNA-SEQ Datasets
W. LII1, I. K. BLABY1, C. E. BLABY-HAAS1, X. F. WANG2, S. MERCHANT2, and M. PELLEGRINI2
1Shanghai Jiao Tong University, Shanghai, China, People’s Republic of China, University of California Los Angeles, Los Angeles, CA

P – Fri - B - 25
Histological Image Classification Using Biologically Interpretable Shape-Based Features
S. KOTHARI1, J. H. PHAN2, and M. D. WANG2
1Georgia Institute of Technology, Atlanta, GA, 2Georgia Institute of Technology and Emory University, Atlanta, GA

P – Fri - B - 26
Using the Sparse Matrix Transformation for the Estimation and Channelization of the Hotelling Model Observer
G. WEN1,2 and M. K. MARKEY1,2
1The University of Texas at Austin, Austin, TX, 2The University of Texas MD Anderson Cancer Center, Houston, TX

P – Fri - B - 27
A Hierarchical Geodesic Model for Diffeomorphic Longitudinal Shape Analysis
N. SINGH1, J. HINKLE1, S. JOSHI1, and P. T. FLETCHER1
1Scientific Computing and Imaging Institute, University of Utah, Salt Lake City, UT

P – Fri - B - 28
Comparison of Symmetry and Shape of the Normal and A1S Pediatric Human Ribcage Through Geometric Morphometrics
S. REDDY1, L. ROBINSON1, R. M. CAMPBELL1, and S. BALASUBRAMANIAN1
1Drexel University, Philadelphia, PA, 2The Children’s Hospital of Philadelphia, Philadelphia, PA

P – Fri - B - 29
Three-Dimensional Reconstruction of Protein P62IMP2
J. LI1, M. ZHANG1, L. ZHANG1, W. SUN1, G. REN1, W. QIAN1, and J. ZHANG1
1University of Texas at El Paso, El Paso, TX, 2Lawrence Berkeley National Laboratory, Berkeley, CA

P – Fri - B - 30
Autocalibrating CT Reconstruction from C-Arm Fluoroscopy Data
J. D. HINKLE1, A. CHERYAKAV1, R. WHITAKER1, and S. JOSHI1
1University of Utah, Salt Lake City, UT, 2GE Healthcare, Salt Lake City, UT

P – Fri - B - 31
Cerebral Blood Flow Measurement by Inversion of Slow DSA Data
C.Y. HSU1, S. KIM1, and A. LININGER1
1University of Illinois at Chicago, Chicago, IL

P – Fri - B - 32
Modeling Temporal Progression of Alzheimer’s Disease
N. VERMA1 and M. K. MARKEY1,2
1The University of Texas at Austin, Austin, TX, 2UT MD Anderson Cancer Center, Houston, TX

P – Fri - B - 33
Efficient Detection of Macromolecular Complexes in Electron Tomograms Based on Reduced Representation Templates
X.P. XU1, C. PAGE1, and N. VOLKMANN1
1Sanford-Burnham Medical Research Institute, La Jolla, CA

P – Fri - B - 34
Automated High-throughput 3D Neuron Reconstruction Using All-Path-Pruning
H. PENGI
1Allen Institute for Brain Sciences, Seattle, WA

Track: Bioinformatics, Computational and Systems Biology

Modeling in Personalized Medicine

P – Fri - B - 35
Integration of Transcriptomic, Proteomic and Metabolomics Data to Reconstruct Genome Scale Metabolic Models of Commonly Used Breast Cancer Cell Lines
Y. WANG1,2, D. MARGINEANTU1, D. HOCKENBERRY1, and N. PRICE2
1University of Illinois, Urbana-Champaign, Urbana, IL, 2Institute for Systems Biology, Seattle, WA, 3Fred Hutchinson Cancer Research Center, Seattle, WA

P – Fri - B - 36
Relative Gene Expression Levels of Two Interacting and Functionally Related Proteins are Consistent Disease Transcriptomic Signatures
Y. WANG1,2, D. MARGINEANTU1, and N. PRICE1,2
1University of Illinois, Urbana-Champaign, Urbana, IL, 2Institute for Systems Biology, Seattle, WA, 3Fred Hutchinson Cancer Research Center, Seattle, WA

P – Fri - B - 37
Design of Surveillance Intervals for Abdominal Aortic Aneurysms
E. SHERER1
1Louisiana Tech University, Ruston, LA

P – Fri - B - 38
Cross-Platform Validation of a Genomic Pattern for the Prognosis and Assessment of GBM Brain Cancer
K. A. AIELLO1 and D. ALTER1
1Department of Bioengineering and Scientific Computing and Imaging Institute, University of Utah, Salt Lake City, UT

P – Fri - B - 39
Mathematical Comparisons of Cancer Patient-Matched Genomic Profiles Predict Survival and Drug Targets
P. SANKHARAPANAN1, T. E. SCHOMAY1, K. A. AIELLO1, and O. ALTER1
1Department of Bioengineering and Scientific Computing and Imaging Institute, University of Utah, Salt Lake City, UT
Track: Bioinformatics, Computational and Systems Biology

Multiscale Modeling - Cells to the Whole Body

P – Fri - B - 40
Entropy of Acceleration Measurements During Swallowing
N. P. Reddy1 and J. T. Povitzis2 Jr.
1University of Akron, Akron, OH, 2Philips Medical Systems, Cleveland, OH

P – Fri - B - 41
Evidence-driven Reconstruction of a Glioblastoma Metabolic Network: A Platform for Data Integration and In Silico Investigation
J. A. Eddy1 and N. D. Price1
1Institute for Systems Biology, Seattle, WA

P – Fri - B - 42
An In Silico Diagnostic for HIV Coreceptor Selection and Disease Progression
D. Morikis1, G. González-Rivera1, C. A. Kieslich1, A. López de Victoria1, and D. Shen1
1University of California, Riverside, Riverside, CA

Track: Biomechanics

Balance, Gait and Locomotion

P – Fri - B - 45
Multi-resolution Network Modeling of Inhomogeneous Nerve Bundle for Magnetic Stimulation
A. K. RamRakhyani1, F. Khan1, D. J. Warren1, Z. B. Kagan1, R. A. Normann1, and G. Laz1
1University of Utah, Salt Lake City, UT

P – Fri - B - 46
Extreme Pathways and In Silico Determined Steroidogenic Robustness
D. Hala1 and D. Huggett1
1University of North Texas, Denton, TX

P – Fri - B - 47
Agent Based Modeling of Stretched Induced Lung Inflammation
A. Reynolds1, J. Herbert1, R. Heise1, and R. Dapari1
1Virginia Commonwealth University, Richmond, VA

P – Fri - B - 48
An Agent-Based Model of Cancer Stem Cell Seeding
K. A. Norton1 and A. S. Poisel1
1Johns Hopkins University, Baltimore, MD

P – Fri - B - 49
Osmotic Pressure of Bovine Serum Albumin in the Presence of Calcium Chloride with Low Ionic Strength
D. Onelas1, N. U. Ozaki1, and V. G. Rodgers1
1University of California, Riverside, Riverside, CA

P – Fri - B - 50
Linking Ciliary Metachronicity to Dynein Motion - A Multiscale Computational Model
S. Mitran1
1University of North Carolina, Chapel Hill, NC
Track: Biomechanics
Biomaterials and Devices

P – Fri - B - 60
Effects of Hydrogel Layer on Adsorption of Proteins and Lubrication Properties of Articular Cartilage
A. Takai1, Y. Morita1, and E. Nakamachi1
1Doshisha University, Kyotanabe, Japan

P – Fri - B - 61
Developing a Magnetic Tweezer Method for High-Resolution Multiplexed Single Molecule Protein Stretching Measurements
H. J. MAHMoud1, K. JOHNSON1, E. CLEMMENS1, T. OLMSHEAD1, R. KIRKPATRICK1, and W. THOMAS1
1University of Washington, Seattle, WA, 2Harvard University, Cambridge, MA

P – Fri - B - 62
Quantitative Evaluation of Cell Adhesion Toward RAD16RGDS Peptide Coated Substrate
Y. TAGAWA1, Y. MORITA1, Y. HIRAND1, and E. NAKAMACHI1
1Doshisha University, Kyotanabe, Japan, 2Kansas University, Suita, Japan

P – Fri - B - 63
Evaluation of Electrical Impedance Related to Matrix Composition of Articular Cartilage Using the two-electrodes Impedance Measurement
Y. SATO1, Y. MORITA1, and E. NAKAMACHI1
1Doshisha University, Kyotanabe, Japan

P – Fri - B - 64
Evaluation of Chondrocyte Damage Caused by Impact Hydrostatic Pressure
T. YAMAGUCHI1, Y. MORITA1, and E. NAKAMACHI1
1Doshisha University, Kyotanabe, Japan

Track: Biomechanics
Cardiovascular Biomechanics

P – Fri - B - 65
Hemodynamics-Induced Autophagy Modulates Mitochondrial Redox Status in Vascular Endothelium
N. JEN1, K. FANG1, R. LI1, D. ANNI1, and T. HSIAI1
1University of Southern California, Los Angeles, CA, 2City of Hope, Duarte, CA

P – Fri - B - 66
Human AAA Tissue in Strain Controlled Biaxial Loading: Histology and Anisotropic Mechanical Response
F. PANCHERI1, W. LING1, M. D. IAFFRATI1, L. DORFMAN1, and R. A. PEATTIE1
1Tufts University, Medford, MA, 2Tufts Medical Center, Boston, MA

P – Fri - B - 67
Direction-Dependent Failure of the Porcine Ascending Thoracic Aorta in Peel and Lap Testing
H. P. WAGNER1, C. WITZENBURG1, S. B. SHAH1, J. M. GOODRICH1, and V. BAROCAS1
1University of Minnesota, Minneapolis, MN

P – Fri - B - 68
Numerical Study Using Cohesive Elements to Understand the Contribution of Strain Energy during Arterial Dissection
B. N. MERED1, M. SUTTON1, S. LESSNER1, S. AVRIL2, and P. BADEL1
1University of South Carolina, Columbia, SC, 2Ecole Nationale Superieure Des Mines De Saint Etienne, Saint Etienne, France

P – Fri - B - 69
Simulation of Atherosclerotic Plaque Delamination Using the Cohesive Zone Model
X. LENG1, X. CHEN1, X. DENG1, M. A. SUTTON1, and S. M. LESSNER1
1University of South Carolina, Columbia, SC, 2University of South Carolina School of Medicine, Columbia, SC

P – Fri - B - 70
VE-cadherin, b-catenin and F-actin Expression in Endothelial Cells Exposed to Shear In Vitro
P. TREMBLAY1 and L. ROULEAU1, 2
1Universite de Sherbrooke, Sherbrooke, QC, Canada, 2Centre Hospitalier Universitaire de Sherbrooke, Sherbrooke, QC, Canada

P – Fri - B - 71
Spline Based Microstructural Mapping for Soft Biological Tissues: Application to Aortic Valves
A. AGGARWAL1, V. AGULAR1, G. FERRARI1, J. GORMAN1, R. GORMAN1, and M. SACKS1
1UT Austin, Austin, TX, 2UPenn, Philadelphia, PA

P – Fri - B - 72
Endothelial Cell Collective Migration is Enhanced on Soft Substrates
A. C. CANVER1 and A. MORSS CLYNE1
1Drexel University, Philadelphia, PA

P – Fri - B - 73
Measurement of Endothelial Permeability Under Chronic Applied Shear Stress in a Bioreactor
S. GRAY1 and P. WEINBERG1
1Imperial College London, London, United Kingdom

P – Fri - B - 74
Cellular and Extracellular Mechanisms of Arterial Stiffness with Aging
Y. Z. GAO1, R. J. SAPHRISTEIN1, R. A. COHEN1, B. SURI1, and K. G. MORGAN1
1Boston University, Boston, MA, 2Boston University School of Medicine, Boston, MA

P – Fri - B - 75
Differential Response of Mesenchymal Stem Cells from Different Anatomic Locations to Long-term Culture and Mechanical Stimulation
M. KOOBATIAN1, M-S. LIAN1, D. SWARTZ1, and S. ANDREADIS1
1State University of New York at Buffalo, Amherst, NY

P – Fri - B - 76
Reproducing the Mechanical Environment Associated with Vascular Disease in Endothelial Cell Studies
S. ZAMBRANO1, R. S. THOMPSON1, and M. MORENO1
1Texas A&M University, College Station, TX

P – Fri - B - 77
Effect of Strain Rate and Cryopreservation Conditions on Elastic Modulus of Veins
S. A. PASQUESS1 and S. S. MARGuLES1
1University of Pennsylvania, Philadelphia, PA

P – Fri - B - 78
A Method for Quantifying Fiber Orientation in Valvular Tissues with Polarized Spatial Frequency Domain Imaging
B. YANG1, M. SHARMA1, M. R. HILL1, J. TUNNEL1, and M. S. SACKS1
1University of Texas, Austin, TX

P – Fri - B - 79
Simulation of Endovascular Treatments for Cerebral Aneurysms
H. BABIKER1, B. CHONG1, J. RYAN1, F. GONZALEZ2, and D. H. FraKES1
1Arizona State University, Tempe, AZ, 2Mayo Clinic College of Medicine, Phoenix, AZ, 3Thomas Jefferson Medical College, Philadelphia, PA
1:30PM – 5:00PM POSTER SESSION Fri B  

POSTER VIEWING WITH AUTHORS & REFRESHMENT BREAK  |  3:45PM - 4:45PM

**Track: Biomechanics**

**Clinical Biomechanics**

P – Fri - B - 80  
High-Resolution Characterization of Deformation and Material Parameters In Vein Specimens  
A. D. GOMEZ1, B. R. WATSON2, H. LI1, I. S. ZHUPLATOV1, Y-T. E. SHIU1, AND E. W. HSIU  
1University of Utah, Salt Lake City, UT

P – Fri - B - 81  
Studying Atherosclerotic Plaque Formation Using In Vivo Imaging and Computational Fluid Dynamics  
V. MEHTA1, S. M. BOVENS1, J. L. TREMOLEDA1, M. WYLEZINSKA-ARRIDGE1, W. GSSEL1, R. PEDRIGO1, AND R. KRAMS1  
1Imperial College London, London, United Kingdom

**Track: Biomechanics**

**Clinical Biomechanics**

P – Fri - B - 82  
Support Vector Machines are Successful at Classifying Lower Extremity Muscle Fatigue during Walking Using Inertial Sensors  
T. E. LOCKHART1, R. SAOANG1, AND J. ZHANG1  
1Virginia Tech, Blacksburg, VA

P – Fri - B - 83  
A Numerical Investigation on Thoracolumbar Vertebrae Fractures Related to Falls  
H. ZHAO1, H. MAO1, Z. YIN1, R. CHEN1, P. BEGEMAN1, X. JIN1, F. ZHU2, Z. WANG1, AND K. YANG2  
1Institute of Surgery, Chongqing, China; People’s Republic of, 2Bioengineering Center, Detroit, MI

P – Fri - B - 84  
Comparing Human Cadaveric Anterior Cruciate Ligament Biomechanical Properties During Knee Flexion Using Mechanical Testing System  
V. D. NGUYEN1 AND H. V. VO1  
1Mercer University, Macon, GA

**Multiscale Modeling of Biomechanical Processes**

P – Fri - B - 85  
The Implementation of a Simplified Thorax Model to Further the Development of a Full Body Finite Element Model  
N. A. VAVALLE1, D. P. MORENO1, J. D. STITZEL1, AND F. S. GAYZIK2  
1Wake Forest University School of Medicine, Winston-Salem, NC, 2Virginia Tech - Wake Forest University Center for Injury Biomechanics, Winston-Salem, NC

P – Fri - B - 86  
3-D Characterization of Axon Micro-kinematic Behavior in Tissue-Scale Trauma  
S. SINGH1, V. PATEL1, A. PELEGRI1, AND D. I. SHREIBER1  
1Rutgers University, Piscataway, NJ

P – Fri - B - 87  
Multi-Scale Modeling of the Endothelial Glycocalyx Layer  
M. PIKOUA1, C. F. DEWEY2, AND Y. VENTIKOS1  
1University of Oxford, Oxford, United Kingdom, 2Massachusetts Institute of Technology, Cambridge, MA

**Track: Biomechanics**

**Sports Biomechanics**

P – Fri - B - 88  
In Silico Osteocyte Network Demonstrates Cell’s Ability to Control the Entire Remodeling Cycle  
M. P. DUFFY1, D. PARKO2, AND H. FISCHER2  
1Massachusetts General Hospital, Boston, MA, 2RWTH Aachen University Hospital, Aachen, Germany

P – Fri - B - 89  
Pattern Recognition of Adipose Tissue in the Lumbar Para-Spinal Muscles Predicts Gender  
N. V. BATTAGLIA1, M. R. MAHFOUZ2, AND R. D. KOMISTEK1  
1University of Tennessee, Knoxville, TN, 2Institute of Biomedical Engineering, Knoxville, TN

**Tracking: Biomechanics**

**Biomechanics**

P – Fri - B - 90  
Characterization and Experimental Analysis of Concussive Impacts Experienced by Major League Baseball Catchers and Umpires  
S. ROWSON1, J. A. BEYER1, AND S. M. DUMA1  
1Virginia Tech, Blacksburg, VA

P – Fri - B - 91  
A Mechanical Evaluation of Ice Hockey Glove Performance  
C. MAGLARAS1, M. POISSER1, AND A. VALDEVI1  
1Stevens Institute of Technology, Hoboken, NJ

P – Fri - B - 92  
Biomechanical Simulation to Estimate the Load on the Ulnar Collateral Ligament during Pitching  
J. BUHL1 AND W. MURRAY1  
1Northwestern University, Chicago, IL, 2Rehabilitation Institute of Chicago, Chicago

P – Fri - B - 93  
Prediction of Vertical Ground Reaction Forces during Golf Swing of Professional Golfers  
A. CHO1, J. KIM1, AND J. H. MUN1  
1The University of Texas Health Science Center at Houston, Houston, TX, 2Sungkyunkwan University, Suwon, Korea, Republic of

P – Fri - B - 94  
A 3D Finite Element Model of Activated Muscle Explains Achilles Tendon Sliding During Eccentric Contraction of the Plantarflexors  
G. G. HANDSFIELD1, L. A. CHERNIK1, D. G. THELEN1, AND S. S. BLEMMER1  
1University of Virginia, Charlottesville, VA, 2University of Wisconsin, Madison, WI

**Track: Biomechanics**

**Biomechanics**

P – Fri - B - 95  
Kinetics of Relaxed Volunteers, Braced Volunteers, and Hybrid III ATD in Low-Speed Frontal Sled Tests  
S. M. BEEMAN1, A. R. KEMPER1, M. L. MADIGAN2, AND S. M. DUMA1  
1Virginia Tech - Wake Forest University, Blacksburg, VA, 2Virginia Tech, Blacksburg, VA

P – Fri - B - 96  
Response of Isolated Whole Human Spleens in Compression: Effect of Perfusion and Loading Rate  
A. R. KEMPER1, A. C. SANTACI1, J. D. STITZEL1, J. L. SPARKS1, AND S. M. DUMA1  
1Virginia Tech - Wake Forest University, Center for Injury Biomechanics, Blacksburg, VA
P – Fri - B - 97
Torsion-Induced Traumatic Optic Neuropathy
M. A. Reilly1, W. E. Spooner1,2, and R. D. Glickman1,3
1University of Texas at San Antonio, San Antonio, TX, 2WESPA, San Antonio, TX, 3University of Texas Health Science Center at San Antonio, San Antonio, TX

P – Fri - B - 98
The Role of Fetal Offset in Removal Force During Human Delivery
A. Lehni1 and M. C. Leftwich1
1The George Washington University, Washington, DC

P – Fri - B - 99
A Pre- and Post- Dilution Method with Filtration for Removing Cryoprotective Agents
L. Gong1, W. Ding1, X. Hu1, S. Sun2, and D. Gao2
1University of Science and Technology of China, Hefei, China, 2People’s Republic of China, 3University of Washington, Seattle, WA

P – Fri - B - 100
A Non-Segmental Rabbit Mandible Model for Bone Regeneration
T. Guida1, D. T. Silliman2, M. Mongia3, and P. Brownbaer2
1University of Texas at San Antonio, San Antonio, TX, 2US Army Institute of Surgical Research, Fort Sam Houston, TX

P – Fri - B - 101
On Mechanical Origins of Embryonic Brain Torsion
Z. Chen1, D. Guo1, H. Forch1, and L. Taber1
1Washington University in St. Louis, Saint Louis, MO, 2Fuzhou University, Fuzhou, China, People’s Republic of China

P – Fri - B - 102
Method for Estimation of Skull Table Thickness from Clinical CT
E. M. Liller1, J. E. Urban1, A. A. Weaver1, and J. D. Stitzel1
1Wake Forest University, Winston Salem, NC

P – Fri - B - 103
Finite Element Modeling of In Vitro Acupuncture Needling
H. Wagner1, J. R. Hogate2, D. Shreiber3, and V. Barocas1
1University of Minnesota, Minneapolis, MN, 2Rutgers University, Piscataway, NJ

P – Fri - B - 104
FEA Simulation Comparison for Crash Test Modeling of Frontal Impacts Using Hybrid-III ATD
C. M. Weaver1, K. A. Danielson2, A. J. Gollman3, and J. D. Stitzel1
1Wake Forest University, Winston-Salem, NC

Track: Biomedical Imaging and Optics

Imaging Applications (Cardiovascular, Neural, Orthopaedics, Cancer)

P – Fri - B - 105
Distribution and Compatibility of VCAM-1 Targeted Rod-Shaped Viral Nanoparticles in an Atherosclerosis Mouse Model
M. A. Bruckman1, L. N. Randolph1, K. Jang1, E. J. Simpson1, L. G. Luyt1, X. Yu1, and N. F. Steinmetz2
1Case Western Reserve University, Cleveland, OH, 2University of Western Ontario, London, ON, Canada

P – Fri - B - 106
Identification of Optical Changes Preceding Seizure Activation Using Optical Coherence Tomography
M. R. Haddad1, M. C. Oliveira1, M. S. Islam1, G. N. Filatov1, M. S. Hu1, D. K. Binder1, M. Bazhenov2, and B. H. Park3
1University of California Riverside, Riverside, CA

P – Fri - B - 107
An Evaluation of Age-specific Atlas-based MRI Brain Segmentation in Premature Neonates
M. Liu1, J. Scott1, V. Chau2, K. J. Poskitty3, S. Miller4, and C. Studholme1
1University of Washington, Seattle, WA, 2University of British Columbia, Vancouver, BC, Canada

P – Fri - B - 108
Investigating In Vivo Fluorescence Imaging of Microdialysis Sampling
J. Haynie1, C. Sides1, T. Posemo1, J. Havens1, and J. A. Stenken1
1University of Arkansas, Fayetteville, AR

P – Fri - B - 109
Developing a Physical Model for Multi-Modal Mammographic Image Registration in the Temporal Domain
J. T. Macdonald1 and S. Sharma1
1DeVry University Chicago, Chicago, IL

Track: Biomedical Imaging and Optics

Imaging Diagnostics and Sensing

P – Fri - B - 110
OcTree-enhanced Variogram Analysis of Heterogeneity in Rat Lung CT Images of Health and Disease
R. Jacobs1, S. Kabilan2, and J. Carlson2
1Pacific Northwest National Lab, Richland, WA

P – Fri - B - 111
Glucose Detection in the Clinically Relevant Range by Raman Spectroscopy with Low Laser Power and Short Acquisition Time
K. Ma1, J. T. Walsh2, R. P. Van Duyn2, and M. R. Glucksberg3
1Northwestern University, Evanston, IL

P – Fri - B - 112
Polymer-Free Optode Nanosensors for Dynamic, Reversible, and Ratiosometric Physiological Sodium Imaging
T. Ruck1, A. Mehta1, and H. Clark1
1Northeastern University, Boston, MA

P – Fri - B - 113
Optical Redox Imaging of Metabolic Dysfunction in Polycystic Ovary Syndrome
Z. Ghanavi1, S. Maleki1, M. Masoudi-Motalagh1, Z. Bolandnazari2, F. Assadi Porter1, and M. Ranji3
1University of Wisconsin Milwaukee, Milwaukee, WI, 2University of Wisconsin Madison, Madison, WI

P – Fri - B - 114
Blood Analysis on a Cellphone
H. Zhu1, J. Stencai1, J. Wong1, S. Dimitrov1, D. Tseng2, and A. Ozcan1
1University of California Los Angeles, Los Angeles, CA

P – Fri - B - 115
Optical Coherence Tomography Imaged ischemic Insult During Kidney Transplant
H-W. Wang1, P. Andrews2, A. Chen1, and Y. Chen1
1University of Maryland, College Park, MD, 2Georgetown University, Washington, DC

P – Fri - B - 116
Structural Imaging Biomarkers for Early Detection of Alzheimer’s Disease
B. P. Printy1, N. Verma1, and M. K. Markey1,2
1The University of Texas at Austin, Austin, TX, 2The University of Texas MD Anderson Cancer Center, Houston, TX
Disease (AD) based on a Spectral Shape Analysis Framework
T. B. L. S. Kostic
Hydrodynamic Focusing via Single-layered pPlaner Microfluidic Device
A. A. Nawaz

Development of a Novel Imaging Probe for Early Detection of Foreign Body Reactions
T. Tsai, J. Zhou, H. Wen, E. N. Tang, D. Baker, and L. Tang

"Microfluidic Drifting" Based Sub-micron-precision,Three-dimensional (3D) Hydrodynamic Focusing via Single-layered pPlaner Microfluidic Device
A. A. Nawaz, K. Mao, J. Rufo, L. Wang, and T. J. Huang

Development of a Novel Portable Multi-channel Near Infrared Spectroscopy System
M. N. Kostic, J. Garrity, T. Vartanan, and W. S. Grundfest, M.D., FACS

Track: Biomedical Imaging and Optics

Novel Approaches to Biomedical Imaging

P – Fri - B - 111
An In-Depth Study of How Engineered Nanoparticles affect Cells, the True Effects of PEG and Variations with Synthesis Method
D. T. Stark, G. K. Das, and I. M. Kennedy
1University of California, Davis, CA

P – Fri - B - 118
PAS/TIRPAS Refractometry: Refractive Index Measurement of Highly Absorbing Materials
B. Golschmidt1, S. Mehta1, J. Mosley1, C. Walter1, P. J. Whitesides1, H. Hunt1, and J. Aitor2
1University of Missouri-Columbia, Columbia, MO

P – Fri - B - 119
Development of a Novel Imaging Probe for Early Detection of Foreign Body Reactions
Y. T. Tsai, J. Zhou, H. Wen, E. N. Tang, D. Baker, and L. Tang
1University of Texas at Arlington, Arlington, TX

P – Fri - B - 120
"Microfluidic Drifting" Based Sub-micron-precision, Three-dimensional (3D) Hydrodynamic Focusing via Single-layered pPlaner Microfluidic Device
A. A. Nawaz, K. Mao, J. Rufo, L. Wang, and T. J. Huang
1Pennsylvania State University, State College, PA, 2Ascent Bionano, State College, PA

P – Fri - B - 121
Testing and Calibration of a Novel Portable Multi-channel Near Infrared Spectroscopy System
M. N. Kostic, J. Garrity, T. Vartanan, and W. S. Grundfest, M.D., FACS
1University of California, Los Angeles, CA

P – Fri - B - 117
Development of Ultrasound-switchable Fluorescence Imaging Contrast Agents with Polarity-sensitive Dyes and Thermo-sensitive Polymers
B. Chen1, 2, M. Wei1, 2, Y. Liu1, 2, H. Pitta1, 2, K. T. Nguyen1, 2, Y. Hoon1, 2, and B. Yuan1, 2
1University of Texas at Arlington, Arlington, TX, 2University of Texas Southwestern Medical Center at Dallas, Dallas, TX

P – Fri - B - 127
Open Cavity Based Opatoacoustic Sensor Enhanced with High-Compressibility Coupling Media
R. Peterson1, S. Solis1, B. Zhang1, H. Huang1, and J. Ye1
1University of Texas at San Antonio, San Antonio, TX

P – Fri - B - 128
Novel Use of Ultrasound to Characterize Strain Rates in Mock Heart Ventricles
S. K. Metzger1, B. A. Schmitt1, K. T. Carman1, D. E. Carver1, D. B. Reynolds1, and M. P. Anstadt1
1Wright State University, Dayton, OH

P – Fri - B - 129
Acoustic Radiation Force Optical Coherence Elastography For Assessing Tissue Biomechanical Properties
R. Li1, W. Qi1, T. Ma1, Q. Zhou1, K. Shindo2, and Z. Chen1
1University of California, Irvine, Irvine, CA, 2University of Southern California, Los Angeles, CA

P – Fri - B - 112
New Phantoms for Evaluating micro-Magnetic Resonance Elastography
B. L. Schwartz1, S. Kerwell1, V. Sandoval1, K. M. Shah1, K. Yasari1, and R. L. Magin1
1University of Illinois at Chicago, Chicago, IL

P – Fri - B - 123
Towards the Identification of Shape Biomarker(s) for Alzheimer’s Disease (AD) based on a Spectral Shape Analysis Framework
H. Xu1, P. Zhang1, and J. Liu1
1Ohio University, Athens, OH

P – Fri - B - 124
An Identification System for Unstained Cells Using Mie Scattering
K. Tomita1 and K. Tsukada2,3
1Graduate School of Fundamental Science and Technology, Keio University, Yokohama, Japan, 2Department of Applied Physics and Physical-Informatics, Faculty of Science and Technology, Keio University, Yokohama, Japan, 3Korea Research Institute of Standards and Science, Daejeon, Korea, Republic of

P – Fri - B - 125
Development and Modeling of a Wedge Phantom for Label-free Quantification of Hemoglobin Using Hyperspectral Microscopy
D. Stark1, J. Lee2, and J. Hwang1
1National Institute of Standards and Technology, Boulder, CO, 2Korea Research Institute of Standards and Science, Daejeon, Korea, Republic of

Track: Biomedical Imaging and Optics

Optical Imaging and Microscopy

P – Fri - B - 130
Widefield Imaging of Changes in Glucose Metabolism and Extracellular pH in Head and Neck Cancer
Z. Luo1, M. Loja1, G. Farwell1, R. Gandour-Edwards1, and N. Nitin1
1UC Davis, Davis, CA

P – Fri - B - 131
3D Characterization of the Fibronectin Matrix in the Embryonic Heart Using Whole-Mount Confocal Microscopy
Q. Jallerat1 and A. W. Feinberg2
1Carnegie Mellon University, Pittsburgh, PA

P – Fri - B - 132
Raman Micro-Spectroscopy Combined with Advanced Data Mining Methods for Improved Pre-Clinical Anti-Cancer Agent Development and Screening
M. B. Fenn1, 2, M. Guarracino1, 2, S. Calhoun1, 2, J. Py1, 2, M. Ferraro1, 2, and P. M. Pardalos2
1Florida Institute of Technology, Melbourne, FL, 2University of Florida, Gainesville, FL

P – Fri - B - 133
Characterizing Collagen Fiber Angles in Mouse Aortas Using Second-Harmonic Generation Microscopy
S. R. Watson1, M. A. Sutton1, and S. M. Lessner1
1University of South Carolina, Columbia, SC

P – Fri - B - 134
Image Correlation Spectroscopy of Multiple Images Predicts Mechanics During Decellularization of Cardiac Tissue
N. J. Meina1, C. Robertson1, A. La1, and S. C. George1
1University of California, Irvine, Irvine, CA
Track: Biomedical Imaging and Optics

Biomedical Imaging and Optics

P – Fri - B - 135
High Speed Dual-wavelength Photoacoustic Microscopy with an Acousto-optic Tunable Filter
J. P. Dumas1, A. K. Loy9, and T. Buma1
1Union College, Schenectady, NY

P – Fri - B - 136
Dual-wavelength Photoacoustic Microscopy at 532 and 1064 nm with a Cost-effective Microchip Laser
A. K. Loy9, J. P. Dumas1, and T. Buma1
1Union College, Schenectady, NY

P – Fri - B - 137
A Large Field-of-View Nonlinear Microscope for Biological Imaging
J. J. Field1, M. D. Young2, C. Eitel1, S. Tobet1, J. A. Souier3, and R. A. Bartels1
1Colorado State University, Fort Collins, CO, 2Colorado School of Mines, Golden, CO

P – Fri - B - 138
Interferometric Scattering Measurements of Organelle Sizes in Single Cells
R. Qian1, D. W. Shipp1, and A. J. Berger1
1University of Rochester, Rochester, NY

P – Fri - B - 139
Modular Automated Optical Tweezers
B. Reed1, B. Jassmelejado1, and G. Xu1
1University of Central Oklahoma, Edmond, OK

P – Fri - B - 140
Optical Measurement of Muscle Oxygenation Identifies Oxygen Insufficiency in Hemorrhage and Hypoxia
L. S. Arakaki1, W. A. Ciesielski1, D. M. McMullan1, and K. A. Schenkman1
1University of Washington, Seattle, WA

P – Fri - B - 141
In Vivo Imaging of Cerebral Edema with Optical Coherence Tomography
C. Reynolds1, M. M. Eberlein1, J. J. Stov1, M. S. Hsu1, D. K. Binder1, and B. Park1
1University of California Riverside, Riverside, CA

P – Fri - B - 142
Development of a Color-Matched Esophagus Phantom featuring Autofluorescence
V. Hou1, C. Yang1, L. Nelson1, and E. Seibel1
1University of Washington, Seattle, WA

Track: Device Technologies and Biomedical Robotics

Cell Adhesion

P – Fri - B - 147
Adhesion Proteins in Confined Geometries: Does Dimensionality Matter?
D. Leckband1, N. Shashikant2, and J. Newhall2
1University of Illinois, Champaign, IL, 2University of Illinois, Urbana, IL

P – Fri - B - 148
On the Activation of Integrin Ibb 3: "Inside-Out" and "Outside-In" Perspectives
M. Mehrbodd and M. R. Mohrad
1University of California, Berkeley, Berkeley, CA

P – Fri - B - 149
Matrix Adhesiveness and Force Generation in Microvascular Network Formation
A. Garrett1, K. Goodch1, and A. Sarangi-Sieminski1
1Olin College, Needham, MA, 2Ohio State University, Columbus, OH

P – Fri - B - 150
OB-cadherin is a Master Regulator of Mesenchymal Stem Cell Differentiation into Smooth Muscle Cells and Development of Contractile Function In Vivo
S. Alimperti1, H. You1, T. A. George2, S. Agarwali3, and S. Andreadis2
1SUNY at Buffalo, Buffalo, NY, 2SUNY at Buffalo, Amherst, NY, 3Baylor College of Medicine, Houston, TX

P – Fri - B - 151
Micro/Nanoscale Spatial Regulation of Platelet -Granule Secretion and Platelet Adhesion
Y. Sakurai1, Y. Qi1, J. L. Fitch-Tewsk1, B. Ahn2, L. Ding2, P. W. Spearman2, R. Flajmenhaft2, and W. A. Lam1
1Children’s Healthcare of Atlanta/Emory University School of Medicine, Atlanta, GA, 2Georgia Tech and Emory University, Atlanta, GA, 3Beth Israel Deaconess Medical Center, Boston, MA

P – Fri - B - 152
Simulations Relate Cellular Adhesion to Molecular Properties
W. E. Thomas1, M. Whitfield1, and O. Yakovenko1
1University of Washington, Seattle, WA, 2MIT, Boston, MA

P – Fri - B - 153
Integrated Cell Migration Model incorporating Spatiotemporal Kinetics of Focal Adhesion Assembly and Disassembly
M-C. Kim1, C. Tan2, J. Chan1, L. Griffith1, R. Kammi1, and H. Asada1,2
1Singapore-MIT Alliance for Research & Technology, Singapore, Singapore, 2National University of Singapore, Singapore, Singapore, 3Duke NUS - Graduate Medical School Singapore, Singapore, Singapore, 4Massachusetts Institute of Technology, Cambridge, MA

P – Fri - B - 154
Efficient Self-contact Induced Membrane Fusion Depends on E-cadherin
G. Sumida1 and S. Yamada1
1University of California, Davis, Davis, CA

P – Fri - B - 155
Comparative Endothelial Cell Response on Micro- & Nanopatterned Titanium & Silicon
P. Vandrangi1, C. G. Gott1, V. G. Rodgers1, and M. P. Rado1
1University of California-Riverside, Riverside, CA
**Track: Cellular and Molecular Bioengineering**

**Mechanotransduction**

*P – Fri - B - 156*

Cell Adhesion on Micropatterned Surfaces  
Y. LIU 1 AND J. HU 1  
1Lehigh University, Bethlehem, PA

*P – Fri - B - 157*

Cells Sense and Respond to Substrate Viscoelasticity  
A. KOUROUKLIS 1, R. LERUM 1, AND H. BERMUDEZ 1  
1University of Massachusetts, Amherst, MA

*P – Fri - B - 158*

Stem Cell Enrichment with Selectin Receptors: Mimicking the pH Environment of Trauma  
T. M. CAO 1, M. J. MITCHELL 1, J. L. LIESTEVLE 2, AND M. R. KING 1  
1Cornell University, Ithaca, NY, 2University of Rochester, Rochester, NY

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**Poster Session FriB**

**P – Fri - B - 166**  
CANCELLED BY AUTHOR

**P – Fri - B - 167**  
Characterizing the Cooperation Between ErbB2 Signaling and ECM Stiffness in Driving Breast Tumor Progression  
A. KURUP 1, T. TSLTY 1, C. YU 1, AND E. BOTVINICK 1  
1University of California, Irvine, Irvine, CA, 2University of California, San Francisco, San Francisco, CA

**P – Fri - B - 168**  
Effect of Shear Stress and Substrate on Endothelial Wound Recovery, Migration Speed and Direction  
M. F. MAJ 1 AND J. Y. Ji 2  
1Indiana University Purdue University Indianapolis, Indianapolis, IN, 2Indiana University Purdue University Indianapolis, Indianapolis, IN

**P – Fri - B - 169**  
The Effects of Dynamic Shear Stress and Platelets on Endothelial Cell ERK1/2 and NF-κB Activation  
F. ROUF 1, D. A. RUBENSTEIN 1, AND W. YIN 1  
1Oklahoma State University, Stillwater, OK

**P – Fri - B - 170**  
Spatially-segregated Engagement of Multiple Integrin Types Alters Mechanotransduction  
S. R. POLIO 1, D. STAMENOVIC 1, AND M. L. SMITH 1  
1Boston University, Boston, MA

**P – Fri - B - 171**  
The Untapped Effects of Tunable Low Intensity Pulsed Ultrasound on Human Bone Marrow Mesenchymal Stem Cell Functions  
C. M. O’BRIEN 1, M. ALJABOZAH 1, W. ZHU 1, K. SARKAR 1, AND L. G. ZHANG 1  
1The George Washington University, Washington, DC

**P – Fri - B - 172**  
Non-Affine Fiber Network Model Predicts Long-Range Stress Propagation Through Fibrous Gels  
M. AGHAVAMI 1, M. S. RUDDICK 1, H. A. CIRKA 1, H. ZARKOOGH 1, K. L. BILLIAR 1, AND E. A. SANDER 1  
1University of Iowa, Iowa City, IA, 2WPI, Worcester, MA

**P – Fri - B - 173**  
Combinatorial Effects of Matrix Stiffness and Soluble Epidermal Growth Factor (EGF) on Keratinocyte Behavior  
Y. FU 1, P. K. KREEGER 1, AND K. MASTERS 1  
1University of Wisconsin-Madison, Madison, WI

**P – Fri - B - 174**  
ECM Stiffness Regulates the TGF Pathway to Induce Chondrocyte Lineage Selection of hMSCs  
J. RYS 1, C. DUFOY 1, J. ALLEN 1, AND T. ALLISTON 1  
1UC Berkeley - UCSF, Berkeley, CA, 2UCSF, San Francisco, CA

**P – Fri - B - 175**  
The Role of Fibronectin Signaling in Epithelial to Mesenchymal Transition  
L. A. GRIGGS 1, D. BERRIE 1, AND C. LEMMON 1  
1Virginia Commonwealth University, Richmond, VA

**P – Fri - B - 176**  
Endothelial Dynamics During Sprouting Morphogenesis  
D. BAZOU 1, J. SONG 1, AND L. MUNNI 1  
1MGH, Harvard Medical School, Boston, MA

**P – Fri - B - 177**  
Adaptation of ERK Signaling Relative to Collagen Transcription in Response to Continuous Versus Intermittent Cyclic Stretching  
J. B. SCHMIDT 1, K. CHEN 1, AND R. T. TRANQUILLO 1  
1University of Minnesota, Minneapolis, MN
Simulations Involving Three-Dimensional Cell Monolayers in a Parallel Plate Flow Channel Yields Non-Uniform Shear Stress Distributions over Cell Surfaces
D. R. Peterson, S. S. Nidavavolu, and S. Kudernatsch
University of Connecticut Health Center, Farmington, CT

Fractal Dimension of Microtubules: Effects of Stretch Pattern
C. L. Oliveira, H. Parmeswiran, E. Bartolak-Suki, and B. Suki
Boston University, Boston, MA

Deletion of Primary Cilia Ift88 Gene from Osteocytes Reduces Loading-Induced Bone Formation
A. M. Nguyen and C. R. Jacobs
Columbia University, New York, NY

Cell Shape Regulates Epithelial-Myofibroblast Transition
J. W. O’Connor and E. W. Gomez
The Pennsylvania State University, University Park, PA

Effect of Complex Substrate Composition on the Ability of Mesenchymal Stem Cells to Sense Stiffness
J. R. Gerslak and L. D. Black
Tufts University, Medford, MA

Tensile Forces Drive Collective Cell Migration Through Three-Dimensional Extracellular Matrices
Department of Chemical and Biological Engineering, Princeton University, Princeton, NJ; Department of Molecular Biology, Princeton University, Princeton, NJ

Enhanced Contractility with DeoxyATP and EMD 57033 Leads to Reduced Myofibril Structure and Twitch Power in Neonatal Cardiomyocytes
M. L. Rodriguez, M. Regnier, and N. J. Snadecki
University of Washington, Seattle, WA

ColVl and Dcn’s Control Over Cytoskeletal Reorganization To Load in Differentiating hMSCs
J. D. Twomey and A. H. Hsieh
University of Maryland, College Park, MD; University of Maryland, Baltimore, MD

Analysis of Cellular Rigidity Sensing Using a Cell-on-a-Chip Assay
S. Wong, W-H. Guo, and F-L. Wang
Carnegie Mellon University, Pittsburgh, PA

A Quantitative Analysis of Superoxide Dismutase and Catalase Augmented Oxidative Stress in Hyperglycemic Environment
J. Chen, H. Patel, K. C. Das, and M. Kaudia
Wayne State University, Detroit, MI; Texas Tech University Health Sciences Center, Lubbock, TX

Changes in Breast Epithelial Cell Morphology in Three-Dimensional in vitro Cell Culture Due to Mechanical Environmental Cues
D. N. Jomoujni, M. Gredola, A. Tippur, C. Dyck, A. M. Nardulli, Y. S. Ziegler, S. Clare, and K. Hsi
University of Illinois Urbana-Champaign, Urbana, IL; Georgia Institute of Technology, Atlanta, GA; Indiana University School of Medicine, Indianapolis, IN

Novel Method to Generate Surrogate Three-dimensional Cell Monolayer Surfaces for Use in Computational Fluid Dynamic Simulations
C. A. Tokarz, S. Kudernatsch, S. S. Nidavavolu, and D. R. Peterson
University of Connecticut Health Center, Farmington, CT

Cancer Drug Delivery

Designing Nanoparticles to cross the Blood Brain Barrier
S. V. Lopez, M. Navaei, P. Nacharaju, M. Silva, J. Friedman, and D. Spray
Albert Einstein College of Medicine, Bronx, NY

Thermo-sensitive Fluorescent Theranostic Nanoparticles For Cancer Therapy
University of Texas at Arlington, Arlington, TX; UT Southwestern Medical Center, Dallas, TX; Pennsylvania State University, University Park, PA

Development of Microneddles for Treatment of Oral Cancers
Y. Ma, Z. Luo, W. Liu, N. Nitin, and H. S. Gill
Texas Tech University, Lubbock, TX; University of California at Davis, Davis, CA; Davis Senior High School, Davis, CA

Comparison of Tobacco Mosaic Virus Rods and Cowpea Mosaic Virus Icosahedrons in a Spheroïd Model
K. L. Lee, L. Hubbard, S. Henn, M. Gratzi, and N. F. Steinmetz
Case Western Reserve University, Cleveland, OH

Attachment and Uptake of Pendant-Chain Delivery System for Cancer Under Physiological Flow
K. Shah, D. Crovder, R. Calderon, and Y. Yun
The University of Akron, Akron, OH

Drug Encapsulated Polymeric Microspheres in a Temperature Responsive Aerosolized Spray for a Localized, Sequential Brain Tumor Therapy
J. A. Floyd, A. Galperin, R. Ramakrishnan, R. Rostomily, and B. Ratner
University of Washington, Seattle, WA

Self-assembled Micelles of RAFT-synthesized Polymers: In Vitro Characterization of Hydrophobic Drug Delivery
M. P. Baranello, E. M. Bui, and D. Benyi
University of Rochester, Rochester, NY

Folic Acid-Conjugated Lipid-Polymer Hybrid Nanoparticles for Targeted Delivery of Chemotherapy
E. Palmer and T. Porter
Boston University, Boston, MA

Preparation and Characterization of PCL-PEG-PCL Nanoparticles for Paclitaxel Delivery
L. Zhang, H. Sun, C. Song, and D. Kong
Institute of Biomedical Engineering, CAMS and PUMC, Tianjin, China; People’s Republic of China

Delivery of Therapeutics to Treat Angiogenesis in Disease
E. Rivera-Delgado and H. A. von Recum
Case Western Reserve University, Cleveland, OH
1:30PM – 5:00PM POSTER SESSION Fri B

P – Fri - B - 200
A Multi-targeted Drug Delivery Vehicle Approach that Targets, Triggers and Thermally Ablates HER2+ Breast Cancer Cells
J-D. YOU1,2, P. GUO1,2, and D. T. AUGUSTE1,3
1Harvard University, Cambridge, MA, 2Chungbuk National University, Cheongju, Korea, Republic of; 3The City College of New York, New York, NY

P – Fri - B - 201
Tumor Brachytherapy by an Injectable, Radioactive Polypeptide Conjugate that Coacervates at Body Temperature
J. L. SCHAAL1, X. LI1, J. BHATTACHARJYA1, M. ZALUTSKY1, A. CHILKOTI1, and W. LIU1
1Duke University, Durham, NC

P – Fri - B - 202
Improving PhotoDynamic Efficiency by Synthesis of Folic Acid and Protoporphyrin IX Conjugated Persistent Luminescence Nanoparticles as a New Drug Carrier
H. HOMAYONI1, M. MEGHIZADEH1, X. ZOU1, K. JIANG1, and W. CHEN1
1Joint Biomedical Engineering Program, UT Arlington, UT Southwestern Medical Center, Arlington, Dallas, TX, UT Arlington, Physics, Arlington, TX

Track: Drug Delivery
Nucleic Acid Delivery

P – Fri - B - 203
Insight into the Cellular Uptake and Endosomal Release of Lipid Nanoparticle Based Delivery of siRNA/miRNA Using Novel Probes
X. WANG1, B. YU1, R. C. ZHOU1, Z. YANG1, R. J. LEE1, and J. L. LEE1
1The Ohio State University, Columbus, OH

P – Fri - B - 204
Development of a Novel Multifunctional Nanocarrier for siRNA Delivery
M. GUJRATI1, A. MALAMAS1, T. SHIN1, and Z-R. LU1
1Case Western Reserve University, Cleveland, OH

P – Fri - B - 205
Reducible Star Polymers for Gene Delivery
J.K. Y. TAN1, H. WEI1, J. G. SCHELLINGER1, and S. H. PUN1
1University of Washington, Seattle, WA

P – Fri - B - 206
Identification of Adenovirus-Binding Peptides for Use in Self-Assembling Polymer Shields
C. E. WANG1, A. LIEBER1, D. SHAYKHMETOV1, and S. H. PUN1
1University of Washington, Seattle, WA

Responsive Delivery Systems

P – Fri - B - 207
Balloon Perfusion Novel Bi-layer Nanoparticles to Inhibition Restenosis in Animal Models
J. YANG1, H. XIE1, Z. YANG1, Y. CHEN1, C. WANG1, Y. ZENG1, Q. FANG1, X. LENG1, D. KONG1, H. SUN1, and C. SONG1
1Institute of Biomedical Engineering, Chinese Academy of Medical Science & PUMC, Tianjin, China, People’s Republic of; 2Department of Cardiology, Peking Union Medical College Hospital, Beijing, China, People’s Republic of

P – Fri - B - 208
The Dendritic Cell Response to mRNA Transfection
K. LOOMIS1, S. PAI1, and R. BELLANKONDA1
1Georgia Institute of Technology, Atlanta, GA

P – Fri - B - 209
Chitosan Gene Nanoparticles Coated Endovascular Stents: A New Approach for Local Gene Delivery of Restenosis
D. ZHU1, C. SONG1, D. KONG1, and X. LENG1
1Institute of Biomedical Engineering, Chinese Academy of Medical Sciences & Peking Union Medical College, Tianjin, China, People’s Republic of

P – Fri - B - 210
Self-Assembled Nanoparticles of Enzymatically Generated Polymeric siRNA
K. E. SHOPSOWITZ1, J. DENG1, S. W. MORTON1, and P. T. HAMMOND1
1Koch Institute for Integrative Cancer Research at MIT, Cambridge, MA

P – Fri - B - 211
Preparation and Optimization of Dendrimer Functionalized Gold Nanoparticles for Gene Delivery
E. R. FIGUEROA1, A. Y. LIN1, S. J. YAN1, and R. DREZEL1
1Rice University, Houston, TX

P – Fri - B - 212
Influence of Polyplex Morphology on Cellular Uptake, Intracellular Trafficking, and Transgene Expression
J. SHI1, J. L. CHOI1, B. CHOU1, R. N. JOHNSON1, J. G. SCHELLINGER1, and S. H. PUN1
1University of Washington, Seattle, WA

P – Fri - B - 213
Multifunctional DNAzyme Delivery Based on Graphene Oxide for Simultaneous Detection and Knockdown of Hepatitis C Virus NS3 Gene
S. KIM1, S-R. RYOO1, and D-H. MIN1
1Seoul National University, Gwanak-gu, Seoul, Korea, Republic of

P – Fri - B - 214
An Improved Strategy for the Loading, Characterization, and Controlled Delivery of Peptide Nucleic Acid Therapeutics
K. R. BEAVERS1, J. W. MARES1, B. C. EVANS1, S. M. WEISS1, and C. L. DUVALL1
1Vanderbilt University, Nashville, TN

Track: Drug Delivery
Responsive Delivery Systems

P – Fri - B - 215
Release of Anti-inflammatory Therapeutics from Thermosensitive Nanoparticles Encapsulated in Water-Soluble Polymer Films
A. LAWRENCE1, R. A. SCOTT1, and A. PANITCH1
1Purdue University, West Lafayette, IN

P – Fri - B - 216
Development and Characterization of Biodegradable Multi-functional Nanoparticles for Breast Cancer Treatment
D. KAUR1,2, J. U. MENDON1,3, and K. T. NGUYEN1,3
1University of Texas at Arlington, Arlington, TX, 2UT Southwestern Medical Center, Dallas, TX

P – Fri - B - 217
Development and Optimization of a pH-responsive Hydrogel System for the Oral Delivery of High Molecular Weight Protein Therapeutics
S. D. STEICHER1, E. J. FISCHER1, and N. A. PEPPAS2
1The University of Texas at Austin, Austin, TX

P – Fri - B - 218
Injectable Nanocomposite Hydrogel System for Skin Cancer Treatment
T. N. HILL1, P. TAMBE1, J. MENDON1, Y. YANG1, and K. NGUYEN1
1University of Texas at Arlington, Arlington, TX

P – Fri - B - 219
Vascular Smooth Muscle Responses Under Influence of Stretch and Biological Factors
T. N. HILL1, P. TAMBE1, P. JAIDEJA1, T. KADAPURE1, J-C. CHIAO1, C-J. CHUONG1, and K. NGUYEN1
1University of Texas at Arlington, Arlington, TX

P – Fri - B - 220
Photothermally Controlled Gene/Delivery Using a Functionalized Graphene Oxide
H. KIM1 and W. J. KIM1
1POSTECH, Pohang, Korea, Republic of
Track: Neural Engineering

Deep Brain Stimulation

P – Fri - B - 225
Charge Steering DBS Accommodates Non-optimal Targeting
A. WILLIS1* and A. D. DORVAL1
1University of Utah, Salt Lake City, UT

P – Fri - B - 226
AC Stimulated Schwann Cells Increase NGF Secretion and Promote Greater Neurite Outgrowth
L. ZHANG1, A. N. KOPPES1, and D. M. THOMPSON1
1RIPL, Troy, NY

P – Fri - B - 227
Exploring the Mechanisms of Response Time and Action Suppression Deficits Correlated With Parkinson’s Disease and Deep Brain Stimulation
C. J. ANDERSON1 and A. D. DORVAL, II1
1University of Utah, Salt Lake City, UT

Track: Neural Engineering

Engineering the Neural Environment

P – Fri - B - 228
Elucidation of Fast Axonal Transport in Neurons by Using a Novel Axon Isolation Cell Culture Chamber
H. H. CAICEDO1, G. PIGNO1, and S. BRADY1
1University of Illinois at Chicago, Chicago, IL

P – Fri - B - 229
The Effect of Surface Roughness of Flexible Neural Implants On Glia and Neuron Viability
M. L. KHRIAICH1, 2, S. DAMLE1, P. NGUYEN1, S. REISS1, G. A. SILVA1, 2, and G. CAUWENBERGHS1, 2
1UCSD, La Jolla, CA, 2Institute of Engineering in Medicine, La Jolla, CA

P – Fri - B - 230
Isolated Treatment of CNS Axons and Somata Reveals a Complex Elongation Response to Netrin-1
A. BLASIUK1, D. KILINC1, and G. U. LEE1
1University College Dublin, Dublin, Ireland

P – Fri - B - 231
Neuronal Distribution Around a Biodissolvable Delivery Vehicle for the Insertion of an Ultra-compliant Neural Probe
Z. GUGEL1, T. D. KOZAI1, P. J. GILGUNN1, R. KLUWAN1, O. B. OZDOGANLAR2, G. K. FEDDER1, D. J. WEBER1, X. LI1, and X. T. CUI1
1University of Pittsburgh, Pittsburgh, PA, 2Carnegie Mellon University, Pittsburgh, PA

P – Fri - B - 232
Directed Neuronal Growth Using Magnetic Gradients and Nanoparticles
A. KUNZE1, P. TSENKO1, and D. DI CARLO1
1UCLA, Los Angeles, CA

P – Fri - B - 233
In Vitro Modeling for Central Nervous System Migratory Disorders
A. R. SHORT1, C. ZEISLER1, T. NELSON1, J. LANNUTTI1, J. WINTER1, and J. OTERO1
1The Ohio State University, Columbus, OH

P – Fri - B - 234
Development of Multi-taxi Environment in a Microfluidic Platform to Investigate the Activation and Migration Pattern of Microglia
S. AHN1, J-S. PARK1, S. SONG1, and J. H. SHIN1
1KAIST, Daejeon, Korea, Republic of

Track: Neural Engineering

Motor Neuron Injury

P – Fri - B - 235
Low-Intensity Infrared Stimulation of Xenopus Sciatic Nerve Activates Fast Fibers
D. M. PAGE1, M. D. KELLER1, and G. A. CLARK1
1University of Utah, Salt Lake City, UT, 2Lockheed Martin Aculight, Bothell, WA

P – Fri - B - 236
Visual Evoked Potential Characterization of Rabbit Animal Model For Retinal Prosthesis Research
M. L. KHRIAICH1, A. AKININ1, G. CAUWENBERGHS1, 2, and G. A. SILVA1
1UCSD, La Jolla, CA, 2UCSD, La Jolla, CA

P – Fri - B - 237
Detection of Epileptic Seizures from ECoGs: Time-Frequency Analysis and Artificial Neural Networks
J. PACE1, R. BOSSEMEYER1, P. FISHBACK2, K. ELISEVICH2, and S. RHODES1
1Grand Valley State University, Grand Rapids, MI, 2Grand Valley State University, Allendale, MI, 3Spectrum Health Medical Group, Grand Rapids, MI

P – Fri - B - 238
Evaluating Supervision Methods for Lower-Limb Prosthesis Adaptation
J. SPANIAS1, L. HARGROVE1, and E. PERREault1
1Northwestern University, Chicago, IL

P – Fri - B - 239
Side-by-side Experiments and Simulations of Neuronal Circuitry and Responses to Stimuli
K. M. FITZGERALD1, T. SHINBORI1, and B. L. FIRESTEIN1
1Rutgers University, Piscataway, NJ

P – Fri - B - 240
Neural Recording System with a 24 bit High-resolution Analog-to-digital Converter for Fast Neural Spike Recovery After Electrical Stimulations
H. JUNG1 and Y. NAM1
1KAIST, Daejeon, Korea, Republic of
Track: Neural Engineering

Neural Engineering: From Basic Studies to Translation

P – Fri - B - 245
Epideral Stimulation and/or Pharmacological Neuromodulation Facilitate Standing in Spinal Rats
M. RATH1,2, P. GAO1, J. CHO1, V. EDGERTON1, R. R. ROY1, H. ZHONG1, and Y. GERASIMENKO1,2
1UCLA, Los Angeles, CA; 2Pavlov Institute of Physiology, St. Petersburg, Russian Federation

P – Fri - B - 246
Electrical Stimulation Induces Enhanced Myelination in a Novel Microfluidic Platform
H. LEE1, N. THAKOR1,2, and I. YANG1,2
1National University of Singapore, Singapore, Singapore; 2Johns Hopkins University, School of Medicine, Baltimore, MD

P – Fri - B - 247
Component based EEG Indices for the Time-on-Task Effect and Workload in Realistic Simulated ATC Tasks
D. DASARI1, G. SHOU1, and L. DING2,3
1School of Electrical and Computer Engineering, University of Oklahoma, Norman, OK; 2Center for Biomedical Engineering, University of Oklahoma, Norman, OK

Track: Tissue Engineering

Cardiovascular Tissue Engineering

P – Fri - B - 251
Injectable Matrix Embedded Endothelial Cells (MEEC) for Vascular Therapy
A. FREIMANN1,2, M. M. SPERRY3, E. EDELMAN1,2, and N. ARTZ1,2
1MIT, Cambridge, MA; 2Og Braude College, Karmiel, Israel; 3Harvard Medical School, Boston, MA

P – Fri - B - 252
Photocrosslinking Kinetics and Matrix Stiffness/Adhesion Differentially Regulate Human Mesenchymal Stem Cell Phenotype within 3D Printed Heart Valves
L. A. HOCKADAY1, B. DUAN1, E. KAPETANOVIC1, K. H. KANG2, P. ARMSTRONG1, L. LEE2, and J. T. BUTCHER1
1Cornell University, Ithaca, NY
2University of Utah, Salt Lake City, UT

P – Fri - B - 253
Enhanced Action Potential Phase 2 Produced in Novel Anisotropic Model of Adult Guinea Pig Cardiomyocyte Monolayer Using Nanopatterned Substrata
R. JOSHI-MUKHEERJEE1, J. MACADANGDANG1, G. KOSTECKI2, N. TROSPER3, D. YUE4, D. H. KIM2, and L. TUNG1
1Johns Hopkins University, Baltimore, MD; 2University of Washington, Seattle, WA

P – Fri - B - 254
Impact of Pericytes on Vessel Formation and Anastomosis in Prevascularized Tissues
L. TIAY1, A. ALEJIA1, A. HUGHES1, and S. GEORGE1
1University of California, Irvine, Irvine, CA

P – Fri - B - 255
Vascularization of Fibrin(PolyEthylene Glycol)-based Hydrogels using Amniotic Fluid-Derived Stem Cells
O. M. BENAHIDES1, J. QUINT1, J. P. CONNELL1,2, R. RUANO2,3, and J. G. JACOY1,2
1Rice University, Houston, TX; 2Baylor College of Medicine, Houston, TX; 3Texas Children’s Hospital, Houston, TX

P – Fri - B - 256
Fatigue Properties of Electrospun Tri-Layered Vascular Graft Scaffolds
C. H. LEE1, B. N. BLACKSTONE1, M. T. NELSON1, J. J. LANNUTTI3, and H. M. POWELL1
1The Ohio State University, Columbus, OH
**POSTER SESSION Fri B 1:30PM – 5:00PM**

**POSTER VIEWING WITH AUTHORS & REFRESHMENT BREAK | 3:45PM - 4:45PM**

**FRI, SEPT 27, 2013**

<table>
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<tr>
<th>P – Fri - B - 257</th>
<th>Induction of Mesenchymal Stem Cell Antithrombogenicity with Laminar Flow</th>
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<tbody>
<tr>
<td>L. A. MEIER1, M. H. CHEN1, AND R. T. TRANQUILLO1</td>
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<td>1University of Minnesota, Minneapolis, MN</td>
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**P – Fri - B - 258**

**Mechanical Characterization of Cellularized and Decellularized Tissue Constructs**

B. ZHOU1, M. G. GABRIEL1, S. KLATT2, W. TWAL3, T. SHAZY1, S. M. LESSNER1, AND W. S. ARGRAVES3

1University of South Carolina, Columbia, SC, 2Medical University of South Carolina, Charleston, SC

**P – Fri - B - 259**

**Controlled Nutrient Gradients Enhance Smooth Muscle Cell Repopulation of an Acellular Vascular Scaffold**

A. B. VAN DE WALLÉ1 AND P. S. MCFETRIDGE1

1University of Florida, Gainesville, FL

**P – Fri - B - 260**

**Development of a Small Diameter Vascular Graft Using Adipose-Derived Stem Cells**

J. H. ARRIZABALAGA1 AND M. U. NOLLER1

1University of Oklahoma, Norman, OK

**P – Fri - B - 261**

**Effect of Glycidyl Methacrylate Conjugation and Crosslinking on Chitosan Material Properties**

A. M. JACOB1 AND H. W. MATTHEW2

1Wayne State University, Detroit, MI

**P – Fri - B - 262**

**The Effect of Cell Shape on Foam Cell Formation**

T. D. SMITH1, T. WANG2, J. SUHALIM1, A. ALFONSO GARCIA1, E. O. POTMA2, AND W. F. LIU1

1University of California, Irvine, Irvine, CA

**P – Fri - B - 263**

**Towards Large-scale Micro-vessel Networks Via Microfluidic Tissue Engineering**

M. XU1, Y. XIAO2, Q. ZHENG2, R. FAN1, AND J. ZHOU1

1Yale University, New Haven, CT, 2Fudan University, Shanghai, China, People’s Republic of China

**P – Fri - B - 264**

**Development of a Hydrogel System to Present EphrinB2 and EphB4 Signals for Controlling Arterial/Venous Differentiation of Stem Cells**

T. B. DORSEY1 AND G. DAI1

1Rensselaer Polytechnic Institute, Troy, NY

**P – Fri - B - 265**

**Evaluating Pericyte-like Behaviors of Stem Cells on Excised Microvessels**

E. L. NYBERG1, S. SEAMAN1, AND S. M. PEURCE1

1University of Virginia, Charlottesville, VA

**P – Fri - B - 266**

**Collagen Immobilized Nanowire Surfaces for Cardiovascular Applications**

V. LESZCZAK1 AND K. C. POPP1

1Colorado State University, Fort Collins, CO

**P – Fri - B - 267**

**Coculture with Cardiac Cells Demonstrated Cardiogenic Potential in Amniotic Fluid-Derived Stem Cells**

Y. GAO1, R. RUAN2,3, AND J. G. JACOT1

1Rice University, Houston, TX, 2Texas Children’s Hospital, Houston, TX, 3Baylor College of Medicine, Houston, TX

**P – Fri - B - 268**

**Utilizing IPS Derived Endothelial Cells on Bioprosthetic Venous Valves**

C. M. JONES1, K. L. MIRZA1, A. M. DILLIER1, D. PAVCN1,4, AND M. T. HINDS5

1Oregon Health & Science University, Portland, OR

**P – Fri - B - 269**

**Functional Consequences of a Tissue-Engineered Myocardial Patch for Cardiac Repair in a Rat Infarct Model**

J. S. WENDEL1, L. YE1, P. ZHANG1, R. T. TRANQUILLO1, AND J. ZHANG1

1University of Minnesota, Minneapolis, MN

**P – Fri - B - 270**

**Cardiac Tissue Constructs with Perfusable Hierarchical Vasculature**

M. ROBERTS1, C. MURRY1, AND Y. ZHENG1

1University of Washington, Seattle, WA

**P – Fri - B - 271**

**Antigen Removal for the Production of Immunoacceptable Xenogeneic Scaffolds for Myocardial Patch Tissue Engineering**

A. PAPALAMPROU1 AND L. GRIFFITHS1

1University of California Davis, Davis, CA

**P – Fri - B - 272**

**Characterization of Diabetic and Aged Adipose-Derived Stem Cells For Tissue Engineered Blood Vessels**

J. T. KRAIWI1, J. A. PHILLIPS1, B. J. PHILLIPS1, C. M. ST. CROX1, S. C. WATKINS1, T. G. GLEASON1, J. P. RUBIN1, AND D. A. VORP1

1University of Pittsburgh, Pittsburgh, PA

**P – Fri - B - 273**

**In Vitro Self-assembly of Tissue Constructs Containing Capillary-like Vascular Networks**

C. A. CZAJKA1 AND C. J. DRAKE1

1Medical University of South Carolina, Charleston, SC

**P – Fri - B - 274**

**Carbon Nanotube-Embedded PGS:Gelatin Fibrous Scaffolds for Cardiac Tissue Engineering**

M. KURAZHA1,2, J. SHIN1,2, M. NIKKHAH1,2, S. N. TOPKAYA1,2, N. MASDOUM1,2, M. R. DOKMECI1,2, AND A. KHADEMHOSSEINI1,2

1Harvard Medical School, Cambridge, MA, 2Harvard-MIT Division of Health Sciences and Technology, Cambridge, MA

**P – Fri - B - 275**

**Estimating Effective Conducivities Of Engineered Cardiac Monolayers**

T. GORKHALE1 AND C. HERNIGUER1

1Duke University, Durham, NC

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**Track: Tissue Engineering**

**Dental Tissue Engineering**

**P – Fri - B - 276**

**Microenvironment Effects on Self-renewal and Differentiation of Dental Epithelial Stem Cells**

M. G. CHAVEZ1, T. VO1, O. D. KLEIN1, AND T. A. DESAI1

1University of California, San Francisco, San Francisco, CA

**P – Fri - B - 277**

**Effects of Hydrogel Photoencapsulation on the Viability of Primary Salivary Gland Cells**

A. D. SHUBIN1, T. FELONG1, C. E. OVITT1, AND D. S. BENOTT1

1University of Rochester, Rochester, NY
**Track:** Tissue Engineering

**Skin and Adipose Tissue Engineering**

**P – Fri - B - 278**

*In Vivo and In Vivo Investigations of Poly (L-lactic Acid)/Ibuprofen Nanofibers for Skin Wound Healing Applications*

M. Mohiti-Asl†, S. V. Murphy‡, S. Saha*, B. Pourdeyhimi*, A. Atala†, and E. G. Loboa†,‡

†North Carolina State University, Raleigh, NC, ‡Wake Forest Institute of Regenerative Medicine, Winston-Salem, NC, *North Carolina State University & University of North Carolina at Chapel Hill, Raleigh, NC

**P – Fri - B - 279**

*Leveraging Anti-Cancer Properties of Tannic Acid Cross-Linked Scaffolds*

B. Inskeep° and K. Burg†

†Clemson University, Clemson, SC

**P – Fri - B - 280**

*Printable Skin Graft in Athymic Nude Mouse Model*

M. G. Yanez∥, J. Rincon∥, A. Jones∥, R. Gonzales∥, and T. Boland∥

∥The University of Texas at El Paso, El Paso, TX
Track: Tissue Engineering
OP - Fri - 2 - 1 - Room 6B
Cardiovascular Tissue Engineering III
Chairs: Marsha Rolle

1:30PM
Cardiac Fibroblasts Alter the Structure and Function of 3D Engineered Cardiac Tissues in an Age-dependent Manner
Y. Li1, B. Liao2, R. Kirkton1, and N. Bursac1
1Duke University, Durham, NC

1:45PM
Asynchronous Dual Electrical and Mechanical Stimulation Improves the Calcium Handling Dynamics in Engineered Cardiac Tissue
K. Y. Morgan1 and L. D. Black1
1Tufts University, Medford, MA

2:00PM
Plug & Play Bioreactor with Electrical Stimulation and Perfusion for Cardiac Tissue Engineering
N. Tandon1, E. Cimetta1, E. de Bernardinis1,2, and G. Vujjak-Novakovic1
1Columbia University, New York, NY; 2Cooper Union, New York, NY; 3Politecnico di Milano, Milano, Italy

Track: Biomaterials
OP - Fri - 2 - 2 - Room 6C
Biomaterial Scaffolds II
Chairs: Lakshmi Nair, Yun Wang

1:30PM
Biodegradable Citric-Acid Based Polymers Have Intrinsic Antioxidant and Metal Chelating Properties
R. Van Lith1, E. Gregory1, M. Kibbe1, and G. Ameer1
1Northwestern University, Evanston, IL

1:45PM
Designing Safe Long-Circulating Tracers for the New Magnetic Particle Imaging (MRI) Modality
A. P. Khandhar1, H. Aramp1, R. M. Ferguson1, and K. M. Krishnan1
1University of Washington, Seattle, WA

2:00PM
Biodegradable Magnesium Vascular Stent with Low Inflammatory Response and Reduced In-Stent Restenosis
L. Mao1, M. Kvaj1, L. Shen1, R. Fan1, and G. Yuan1
1Shanghai Jiaotong University, Shanghai, China; People’s Republic of; 2Yale University, New Haven, CT; 3Fudan University, Shanghai, China; People’s Republic of

Track: Translational Biomedical Engineering
OP - Fri - 2 - 3 - Room 606
Cell-based Products for Regenerative Medicine
Chairs: Adam Engler, Jeffrey Jacot

1:30PM
Thin-Film Cell Encapsulating Devices for Type 1 Diabetes
C. Nyitrai1, G. Faleo1, Q. Tang1, and T. Desai1
1University of California, San Francisco, San Francisco, CA

1:45PM
Enhancing Immunomodulatory Secretion of Mesenchymal Stem Cells by Pre-Conditioning through Environmental Conditions
J. A. Zimmermann1 and T. C. McDevitt1,2
1Georgia Institute of Technology & Emory University, Atlanta, GA; 2Georgia Institute of Technology, Atlanta, GA

2:00PM
Innovative Strategy for the Recruitment of Progenitor Cells Using Tissue-Engineered 3D-Endothelial Cells
L. Indolfi1, C. Iaconetti1, C. Indolfi1, and E. R. Edelman1
1MIT, Cambridge, MA; 2Magra Graecia University, Catanzaro, Italy

2:15PM
Harnessing Native Signaling Pathways to Improve the Function and Survival of β-cells for a Bioartificial Pancreas
S. Duncanson1 and A. Sambanis1
1Georgia Institute of Technology, Atlanta, GA

Track: Biomechanics
OP - Fri - 2 - 4 - Room 607
Biomaterials and Devices
Chairs: David Vorp, Leo Wan

1:30PM
Design and Implementation of Vacuum Assisted Anchorage for Uniaxial Tensile Testing of Soft Tissues
K. Blose1,2, J. Pichamuthu1,3, and D. Vorp1,2
1University of Pittsburgh, Pittsburgh, PA; 2Center for Vascular Remodeling & Regeneration, Pittsburgh, PA; 3McGowan Institute of Regenerative Medicine, Pittsburgh, PA

1:45PM
Capturing the Local Mechanical Environment and Single Fiber Response in PCL Scaffolds
D. Gutschick1, H. Paranjape1, A. M. De Jesus1, E. Sander1, H. M. Powell1, and P. M. Anderson1
1The Ohio State University, Columbus, OH; 2The University of Iowa, Columbus, OH; 3The University of Iowa, Iowa City, IA

2:00PM
Novel Silk-Based Fabrication Techniques to Prepare High Strength, Complex Geometry Calcium Phosphate Ceramic Scaffolds via Machining or Injection Molding
S. L. McNamara1, T. J. Lo1, and D. L. Kaplan1
1Tufts University, Medford, MA
2:15PM
Using Microcantilevers to Study Interactions Between Tissue Mechanics and Cell Function During Remodeling of 3D Microtissues
R. Zhao1, T. Boudu1, W-G. Wang1, C. S. Chen2, and D. H. Reich1
1Johns Hopkins University, Baltimore, MD, 2University of Pennsylvania, Philadelphia, PA

Track: Tissue Engineering
OP - Fri - 2 - 5 - Room 608
Cell Delivery and Cell Homing Technologies
Chairs: Laura Suggs

1:30PM
Tissue Growth and Cellular Organization are Influenced by Flow Rate and Pressure in Decellularized Liver Perfusion Bioreactors
E. C. Moran1, P. M. Baptista1, J. L. Sparks2, and S. Soker2
1Wake Forest University, Winston-Salem, NC, 2Wake Forest Institute for Regenerative Medicine, Winston Salem, NC, 3Miami University, Oxford, OH

1:45PM
Progenitor Cell Recruitment via SDF-1-Cocorecvor-absorbed in Vascular Grafts
K.W. Lee1, N. Johnson1, J. Gao1, and Y. Wang1
1University of Pittsburgh, Pittsburgh, PA, 2McGowan Institute for Regenerative Medicine, Pittsburgh, PA

2:00PM
A Cell-friendly Process to Fabricate Hydrogels with Microchannel-like Porosity for Tissue Engineering
L-H. Han1, J. Hammer2, X. Tong1, and F. Yang1
1Stanford University, Stanford, CA, 2Arizona State University, Phoenix, AZ

2:15PM
Human Integration-free iPSC-derived Neural Crest Stem Cells for Peripheral Nerve Regeneration
C-W. Huang1, W-C. Huang1, J. Xiu1, F. Yuan1, J. Wang1, R. Chen1, D. Isra1, S. Patel1, M-M. Pod1, and S. Li1
1UC Berkeley, Berkeley, CA, 2UC Berkeley-UCSF, Berkeley, CA
3Huazhong University of Science and Technology, Wuhan, China, People’s Republic of China

Track: Cancer Technologies
OP - Fri - 2 - 6 - Room 609
Bioengineering Models of Cancer II
Chairs: Pamela Kreeger, Shilpa Sant

1:30PM
3D In Vitro Tumor Models for The Evaluation of Nanoparticle-Based Cancer Therapeutics
X. Xu1 and X. Jia2
1Department of Materials Science & Engineering, University of Delaware, Newark, DE, 2Biomedical Engineering Program, University of Delaware, Newark, DE

1:45PM
Interfacial Mechanics in an Electrospun Fiber Mat-Hydrogel Composite Brain Cancer Model
M. Calhoun1, A. Short1, T. Nelson1, A. Sarkar1, J. Lannutti1, and J. Winter1
1The Ohio State University, Columbus, OH, 2Gesinger Medical Center, Danville, PA

2:00PM
“Prevascularized Tumors”: Tissue Engineering a Multicellular Model of Solid Human Tumor Spheroids Perfused by Microvessels
S. M. Ehsani1, L. Alonzo2, M. L. Waterman1, C. C. Hughes1, and S. C. George1
1University of California, Irvine, Irvine, CA

2:15PM
Tissue-Engineered Models of the Tumor Microenvironment to Study Inflammation, Hypoxia, and Angiogenesis
P. Delneri1, B. Kwee1, S. Verbridge2, M. Lane3, B. Humpedt4, and C. Fischbach1
1Cornell University, Ithaca, NY, 2Virginia Tech-Wake Forest, Blacksburg, VA, 3Weill Cornell Medical School, New York, NY

Track: Cardiovascular Engineering
OP - Fri - 2 - 7 - Room 612
Microvascular and Lymphatic System
Chairs: Scott Diamond, Sara Nunes

1:30PM
An Engineered Model to Evaluate Natural Killer Cell Mediated Therapeutic Intervention of Lymph Node Micrometastases
S. Chandrasekar1, M. J. McGuire1, and M. R. King1
1Cornell University, Ithaca, NY

1:45PM
Design and Fabrication of a Microfluidic Platform to Replicate Low Shear Stress Recirculation Seen in Atherosclerosis Lesion Susceptible Regions
P. K. Patibandla1, R. Estrada1, M. Kannan1, C. Bhikha1, Y. Lian1, and P. Sethu1
1University of Louisville, Louisville, KY

2:00PM
Caged Fluorescein Linked Albumin Reveals Regional Heterogeneity During Thrombus Formation in Mice
J. D. Welsh1, T. J. Stalker1, R. Vordonov1, R. Muthard1, S. L. Diamond1, and L. F. Brass1
1University of Pennsylvania, Philadelphia, PA

2:15PM
The Contributory Role of Impaired Neutrophil Fluid Shear Mechanotransduction in Hypercholesterolemia-Related Dysregulation of Microvascular Blood Flow
X. Zhang1, R. Cheng1, D. Rowe1, P. Sethu1, G. Yu1, A. Daugherty1, and H. Y. Shin1
1University of Kentucky, Lexington, KY, 2Paul L. Dunbar High School, Lexington, KY, 3University of Louisville, Louisville, KY

Track: Cellular and Molecular Bioengineering
OP - Fri - 2 - 8 - Room 604
Cell Adhesion II
Chairs: Mohammad Mofrad, Todd Sulchek

1:30PM
Direct Evidence of Simultaneous Conformational Change Between the Closing of the Hinge Interdomain Angle and the Opening of the Binding Pocket in L-selectin
P. Cardenas Lizardo1, J. Lou1, and C. Zhu1
1Georgia Institute of Technology / Emory University, Atlanta, GA, 2Chinese Academy of Science, Beijing, China, People’s Republic of China, 3Georgia Institute of Technology, Atlanta, GA

1:45PM
Dynamics of Cell-ECM Interactions Under Acute Shear Stress By Modulation of Integrin Affinity
A. Fuhrmann1 and A. J. Engler1
1University of California San Diego, La Jolla, CA
2:00PM
The Shear Rate Dependence of Nitric Oxide Inhibition of Platelet Aggregation
J. L. SYLVEST1, S. M. LANTIT1, M. M. REYNOLDS2, and K. B. NEEVES3,1
1Colorado School of Mines, Golden, CO, 2Colorado State University, Fort Collins, CO,
3University of Colorado, Denver, Denver, CO

2:15PM
Myofiber Depletion Increases Adhesion and Adhesin Adhesion Proteins in Breast Cancer Cells
B. N. BLACKSTONE1, R. LI1, M. BECHEL1, J. J. WILLARD1, W. E. ACKERMAN1,
S. N. GHADG1, H. M. POWELL1, and D. A. KNIS1
1The Ohio State University, Columbus, OH

Track: Stem Cell Engineering
OP - Fri - 2 - 9 - Room 611
Bioprocessing of Human Cells

Chairs: Sharon Gerecht, Raj R. Rao

1:30PM
Engineering Stable Bone Tissue Substitutes From Human Pluripotent Stem Cells (Invited)
G. M. DE PEPP1, J. MARCOS CAMPOS2, D. KAHLER1, D. ALSALMAN1, L. SHANG1,
G. VIJNUK NOVAKOVIC2, and D. MAROLT1
1The New York Stem Cell Foundation, New York, NY, 2Columbia University, New York, NY

1:45PM
A Defined, Scalable 3D Culture System for Producing Human Pluripotent Stem Cells and Their Progenies
Y. LEI1 and D. SCHAEFFER1
1University of California, Berkeley, Berkeley, CA

2:00PM
Rapid and Scalable Expansion of Human IPS Cells in Chemically Defined and Xeno-Free Suspension Culture System
Y. WANG1, B.-K. CHOU1, S. DOWEY1, S. GERETH1, and L. CHENG2
1The Johns Hopkins University, Baltimore, MD, 2The Johns Hopkins University School of Medicine, Baltimore, MD

2:15PM
Xeno-Free Expansion and Directed Differentiation of Human Pluripotent Stem Cells in Scalable Microcarrier Bioreactors
Y. FAN1, M. HSIUNG1, C. CHENG1, and E. S. TZANAKAKIS1
1SUNY-Buffalo, Buffalo, NY

Track: Device Technologies and Biomedical Robotics
OP - Fri - 2 - 10 - Room 602
Implantable Devices

Chairs: Keefe Manning, Sarah Vigmastad

1:30PM
Computational Simulations of IVC Filter Impantation in Patient-Specific Geometries
K. I. AVCI1, E. M. FOX1, S. M. SASTRY1, J. KIM1, S. M. SHONTZ1, F. C. LYNCH1,
B. A. CRAVEN1, and K. B. MANNING1
1The Pennsylvania State University, University Park, PA, 2University of Utah, Salt Lake City, UT,
3Mississippi State University, Starkville, MS, 4Penn State Hershey Medical Center, Hershey, PA

1:45PM
An Implantable Vascular Coupling Device for End-to-End Anastomosis
H. LI1, C. GEHRKE1, H. SANT1, B. GALE1, and J. AGARWAL1
1University of Utah, Salt Lake City, UT

2:00PM
Micromachined Multielectrode Microprobes for Sensing of Glutamate and Dopamine In Vivo
T. C.-C. TSENG1, V. TOLOSA1, K. WASSUM1, N. MAIDMENT1, and H. MONBOUGUETTE2
1National Taiwan University of Science and Technology, Taipei, Taiwan, 2Lawrence Livermore National Laboratory, Livermore, CA, 3UCLA, Los Angeles, CA

2:15PM
Early Detection of Biofilm-Related Infections by Impedance Monitoring in Central Venous Port Prototypes.
J. PAREDES1,2, A. AGUINADA3, J. L. DEL POZO3, and S. ARANA4,1
1CEIT and Tecun (University of Navarra), Donostia-San Sebastián, Spain, 2CIC microGUNE,
Arrasate-Mondragon, Spain, 3Clinica University of Navarra, Pamplona, Spain

track sponsored by Medtronic

Track: Bioinfomatics, Computational and Systems Biology
OP - Fri - 2 - 11 - Room 615
Multiscale Spatiotemporal Modeling and Simulation

Chairs: Michael R. King, J. Nathan Kutz

1:30PM
Simulation of Platelet, Thrombus and Erythrocyte Hydrodynamic Interactions in a 3D Arteriole with In Vivo Comparison (Invited)
W. WANG1, T. G. DIACOVO1, J. CHEN2, J. B. FREUND3, and M. R. KING1
1Cornell University, Ithaca, NY, 2Columbia University, New York, NY, 3University of Illinois at Urbana-Champaign, Urbana, IL

2:00PM
Motifs for Encoding/Decoding of Neuro-Sensory Information (Invited)
J. KUTZ1
1University of Washington, Seattle, WA

Track: Biomedical Engineering Education
OP - Fri - 2 - 12 - Room 616
Teaching Outside the (Classroom) Box

Chairs: John Desjardins

1:30PM
Development of Trouble-Shooting Workshop for Clinically Relevant Equipment in Low-Resource Settings
Z. CHANELL1, B. GRANT1, A. ORDONEZ2, E. PUCKETT2, E. ALEMAYEHU2, G. ALEMU3,
S. JACOUES2, R. RICHARDS-KORTUM2, and A. SATERN2
1Rice University, Houston, TX, 2Texas Children’s Hospital, Houston, TX, 3Jimma University,
Jimma, Ethiopia, 4Tegare-id Polytechnic College, Addis Ababa, Ethiopia

1:45PM
A BME Outreach Experience: Development of an Inquiry-based Optics Module for Middle School Students
K. WANG1, R. DORAN2, S. SHAKED3, S. ARCHER1, C. FISCHBACH1, and D. GOURDON1
1Cornell University, Ithaca, NY, 2Newfield Central School, Newfield, NY, 3Ithaca College,
Ithaca, NY

2:00PM
Virtual Engineering Internships: Increasing the Participation of Women and Minorities through Epistemic Games
D. E. TETRICK1, G. ARADTOPOUL1, A. RUSS1, D. W. SHAFFER1, and N. C. CHESLER1
1University of Wisconsin-Madison, Madison, WI
2:15PM  
Teaching Pre-College Students to Solve "Wicked" Design Problems  
C. MORAES1, S. BLAIN-MORAES1, S. MORELL-TOMASSON1, and R. GORBET2  
1University of Michigan, Ann Arbor, MI, 2University of Waterloo, Waterloo, ON, Canada

Track: Biomedical Imaging and Optics  
OP - Fri - 2 -13 - Room 618  
Positron Emission Tomography  
Chairs: Anthony J. McGoron  
1:30PM  
Methylphenidate and [18F]-fallypride Striatal Binding in Mice Using Positron Emission Tomography  
X. NIE1, K. PATRICK2, M. CDEBAC3A, C. RILEY III1, D. WILSON1, and A-M. BROOME1,2  
1Radiology and Radiological Science, Medical University of South Carolina, Charleston, SC; 2Center for Biomedical Imaging, Medical University of South Carolina, Charleston, SC; 3Department of Drug Discovery and Biomedical Sciences, Medical University of South Carolina, Charleston, SC; 4Triad Isotopes Inc., Charleston, SC

1:45PM  
Collecting Depth of Interaction Information Using Phosphor Coated Crystals for High Resolution Positron Emission Tomography  
V. VISWANATH1, E. RONCALI1, and S. R. CHERRY1  
1University of California, Davis, Davis, CA

2:00PM  
Measurement of Regional Pulmonary Perfusion from Early 18F-FDG Kinetics Imaged with PET  
T. J. WELLMAN1, T. WINKLER1, N. DE PROST1, and M. VIDAL MELO1  
1Massachusetts General Hospital, Boston, MA

2:15PM  
Improving Breast Cancer Lesion Detectability in 18F-FDG PET Imaging  
K. WANGERIN1,2, M. MUZI1, B. ELSTON2, R. HARRISON2, and P. KINAHAN3,2  
1Bioengineering, University of Washington, Seattle, WA, 2Radiology, University of Washington, Seattle, WA

Track: Nano to Micro Technologies  
OP - Fri - 2 -14 - Room 619  
Nanobiointerfaces II  
Chairs: Carlos Rinaldi, Marissa Rylander  
1:30PM  
Utilizing an Imidazole Ring Polymer for Stabilization of Quantum Dots on Single Walled Nanohorns  
A. M. PERKANEN1, D. INGLEFIELD1, M. R. DEWITT1, T. E. LONG1, and M. N. RYLANDER1  
1Virginia Tech, Blacksburg, VA

1:45PM  
Magnetic Intracellular Manipulation with Customizable Bioactive Superparamagnetic Nanoparticles  
J. KONG1, C. MURRAY1, P. TSENG2, and D. DI CARLO1  
1University of California Los Angeles, Los Angeles, CA

2:00PM  
Photopatterned SU-8 Derived Carbon Nanofibers for Neural Engineering Applications  
P-F. JAO1, E. FRANCA1, G. J. KIM1, B. WHEELER1, and Y-K. YOON1  
1University of Florida, Gainesville, FL

BMES 2013 155
2:15PM
L1 Coating Improves Neural Electrode Integration as Revealed by Multi-photon Microscopy
T. D. KOZAI¹, N. SNYDER¹, A. L. VAZQUEZ², C. F. LAGENAUR¹, S-G. KIM¹, and X. CUI¹
¹University of Pittsburgh, Pittsburgh, PA

Track: New Frontiers and Special Topics
OP - Fri - 2 -17 - Room 614
Emerging Technology II

Chairs: Elain Fu, Chris Jewell

1:30PM
Photoactivation of Micropatterned Antibodies for T-cell Activation
W. JIN¹, D. DUTTA¹, S. SIL¹, and L. KAM¹
¹Columbia University, New York, NY

1:45PM
Lymph Node Delivery as a Platform for Studying the Interactions Between Biomaterials and Lymph Nodes
L. H. TOSTANOSKI¹, J. I. ANDORKO¹, and C. M. JEWELL¹
¹University of Maryland, College Park, MD

2:00PM
Tunable Time-delays for Paper Microfluidic Devices
B. TOLEY¹, B. MCKENZIE¹, and E. FU¹
¹University of Washington, Seattle, WA

2:15PM
Detection and Measurement of Micronutrients in Blood Based Samples
E. LO¹, M. J. STEIN¹, D. G. CASTNER¹, and B. D. RATNER¹
¹University of Washington, Seattle, WA

OP - Fri - 2 -18 - Room 6E
Health Disparities: Innovative Approaches to Improved Health

Chairs: Gilda Barabino, Cato Laurencin
This session will define concepts and issues surrounding racial and ethnic Health Disparities in healthcare. New concepts and views on diversity in the context of creating solutions in science and technology and in healthcare in particular will be presented. A discussion of efforts to address workforce diversity as a means for insuring innovation and excellence in science will be explored. The session is designed to help participants gain a broader understanding of the complexities and implications of health disparities and inequities and the role that biomedical engineers can play in combating them.

Moderator: Gilda Barabino, City College of New York

Speakers:
Cato Laurencin
University of Connecticut
Jean Bonhomme
Morehouse School of Medicine
Randall Morgan
W Montague Cobb/National Medical Association Health Institute
Angelika Domshke
Technology Consultant
Roderic Pettigrew
National Institutes of Health
Friday, September 27, 2013

2:45PM – 3:45PM

**Track: Tissue Engineering**
**OP - Fri - 3 – 1 – Room 6B**

**Cardiovascular Tissue Engineering IV**

**Chairs:** Hak-Joon Sung

**2:45PM**
**Tubular Heart Valves Fabricated From Decellularized Engineered Tissue**
L. A. Meier, Z. H. Syedain, and R. T. Tranquillo

*University of Minnesota, Minneapolis, MN*

**3:00PM**
**Elastomeric Cellularized Constructs for Ventricular Outflow Tract Reconstruction: Fate and Function of Integrated Cells In Vivo**
N. J. Amoroso, T. Yoshizumi, H. Jian, K. Takanari, Y. Hong, K. Tobita, and W. R. Wagner

*University of Pittsburgh, Pittsburgh, PA*

**3:15PM**
**Peripheral Blood EPCs from Coronary Artery Disease Patients as an Endothelial Source for Small Caliber Tissue Engineered Human Blood Vessels**
C. E. Fernandez, G. A. Truskey, and W. M. Reichert

*Duke University, Durham, NC*

**3:30PM**
**Hypertrophic Stimulation of Engineered Cardiac Muscle from Human Pluripotent Stem Cells**
K. L. Kreuziger, K. Dao, M. Razumova, M. Regnier, and C. E. Murry

*University of Washington, Seattle, WA*

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**Track: Biomaterials**
**OP - Fri - 3 – 2 – Room 6C**

**Bioinspired Materials**

**Chairs:** Tracy Hookway, Hyun Joon Kong

**2:45PM**
**Bio-inspired Design of Potent and Selective siRNA Nanomaterials in Rodents and Nonhuman Primates**
Y. Dong, R. Langert, and D. Anderson

*Massachusetts Institute of Technology, Cambridge, MA*

**3:00PM**
**Biologically Inspired Engineering of Underwater Adhesives with Synthetic Biology**
C. Zhong, A. Cheng, and T. Lu

*MIT Synthetic Biology Center, Cambridge, MA; Research Laboratory of Electronics, MIT, Cambridge, MA*

**3:15PM**
**Mechano-Responsive Hydrogels for Tissue Repair and Regeneration**
L. Xiao and X. Jia

*University of Delaware, Newark, DE*

**3:30PM**
**Nanoparticle-Templated Phospholipid Layers Facilitate Understanding of Protein Recognition**
S. Reed

*University of Colorado Denver, Denver, CO*

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**Track: Translational Biomedical Engineering**
**OP - Fri - 3 – 3 – Room 606**

**Translation in Regenerative Medicine**

**Chairs:** Karen Christman, Shyni Varghese

**2:45PM**
**Engineering Articular Neocartilage Using Costochondral Cells: A Combinatorial Stimuli Approach**
M. K. Murphy and K. A. Athanasiou

*University of California Davis, Davis, CA*

**3:00PM**
**Magnetic Resonance Characterization of ECM Integrated Scaffolds for Bone and Cartilage Tissue Engineering**
P. Pothirajav, S. Rayndhan, and M. Kotecha

*University of Illinois at Chicago, Chicago, IL*

**3:15PM**
**In Vitro Maturation and Integration of Engineered Fibrocartilage Through Collagen Enhancement and Crosslinking**
E. A. Makris, R. F. MacBain, J. Yu, and K. A. Athanasiou

*University of California, Davis, Davis, CA; University of Thessaly, Larisa, Greece*

**3:30PM**
**Preclinical Assessment of a Regenerative Medicine Approach to Temporomandibular Joint Meniscus Reconstruction in a Porcine Model**
B. N. Brown, W. L. Chung, J. Cheetham, and S. F. Badylak

*University of Pittsburgh, Pittsburgh, PA; Cornell University, Ithaca, NY*

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**Track: Biomechanics**
**OP - Fri - 3 – 4 – Room 607**

**Sports Biomechanics**

**Chairs:** Aditiya Belawdi, Andrew Kemper

**2:45PM**
**Head Impact Exposure in Youth Football: Elementary School Ages 7 to 8 Years and the Effect of Returning Players**
T. J. Young, R. W. Daniel, S. Rowson, and S. M. Duma

*Virginia Tech - Wake Forest University, Blacksburg, VA*

**3:00PM**
**Head Impact Exposure in Youth Football: Elementary School Ages 9 to 12 Years and the Effect of Practice Structure**

*School of Biomedical Engineering & Sciences, Virginia Tech-Wake Forest University, Blacksburg, VA; School of Biomedical Engineering & Sciences, Virginia Tech-Wake Forest University, Winston-Salem, NC; Wake Forest University School of Medicine, Winston-Salem, NC*

**3:15PM**
**Head Impact Exposure in Middle School Football**
R. W. Daniel II, S. Rowson, and S. Duma

*Virginia Tech - Wake Forest University, Blacksburg, VA*

**3:30PM**
**Head Impact Exposure Measurements in Pediatric Populations**

*Virginia Tech - Wake Forest University, Blacksburg, VA*
Track: Tissue Engineering
OP - Fri - 3 – 5 - Room 608

Neural Tissue Engineering: Brain, Motor Neurons, Eye

Chairs: X. Tracy Cui

2:45PM
Neurotrophic Factor Gradient Delivery for Migration Guidance of Schwann Cells
K. KRICK1, Y.-J. HUANG2, R. MARTIN3, P. SEARSON4, A. KHADEM-HOSSEINI5, A. HOK6, and H-Q. MAO7
1Johns Hopkins School of Medicine, Baltimore, MD, 2Johns Hopkins University, Baltimore, MD, 3Massachusetts Institute of Technology, Cambridge, MA

3:00PM
Direct Conversion of Fibroblast to Neurons via Nanochannel Electroporation
D. GALLEGO-PEREZ1, J. MA1, C. CZISLER1, P. GYGLI1, T. W. SHERWOOD1, X. WANG1, A. ADLER1, Y. WU1, K. LEONG1, C. ASKWITII1, J. OTERO1, and L. J. LEE1
1The Ohio State University, Columbus, OH, 2Duke University, Durham, NC

Track: Cardiovascular Engineering
OP - Fri - 3 – 7 - Room 612

Vascular Mechanics I

Chairs: Michael Davis, Anthony Passerini

2:45PM
The Combined Effect of Matrix Stiffness and Nanotopography on the Regulation of Vascular Smooth Muscle Cell Function
S. CHATER1, P. KIM1, H. J. LEE1, K. GUPTA1, J. LEE1, A. B. BAKER1, and D. H. KIM2
1The University of Texas at Austin, Austin, TX, 2University of Washington at Seattle, Seattle, WA

3:00PM
The Interaction Between Fluid Wall Shear Stress and Solid Circumferential Strain Affects Endothelial Gene Expression
R. A. AMAR1 and J. M. TARBEIl
1The City College of The City University of New York, New York, NY

3:15PM
Aging Endothelial Cells Exhibit Decreased Response to Steady Shear Stress
T. CHEUNG1, J. FU1, L. CAO1, and G. TRUSKEY1
1Duke University, Durham, NC

3:30PM
An Ex Vivo Bio-Assay Chamber for Studying Inflammatory Response in the Mouse Femoral Artery
A. K. BALDWIN1, R. P. GERSC1, B. M. DOUGLAS1, A. NASSER1, T. K. ROSENGART1, and M. D. FRAME1
1Stony Brook University, Stony Brook, NY, 2Baylor University, Houston, TX

Track: Cancer Technologies
OP - Fri - 3 – 6 - Room 609

Biomedical Engineering Modalities for Personalized Cancer Therapy

Chairs: Parijat Bhatnagar, Michael Heller

2:45PM
A 96-well, Plate-based Microfluidic Device for Multiplexed Chemosensitivity Testing on Intact Tissues
C. CHANG1, A. M. MIKHEEV1, R. J. MONNAT, JR.1, R. C. ROSTOMILY1, and A. FOLCH1
1University of Washington, Seattle, WA

3:00PM
Microfluidic 3D Cancer-Type Specific Platform for EMT Blocking Agents Screening
J. BAI1, T.-Y. TU1, J.-P. THERY1, and R. D. KAMMA2,3
1Singapore-MIT Alliance for Research and Technology, Singapore, Singapore, 2Institute of Molecular and Cell Biology (IMCB), 3A*STAR, Singapore, Singapore, 4Massachusetts Institute of Technology, Cambridge, MA

3:15PM
Isolation of Adherent Tumor-Derived Cells: Probing the Biophysical Properties of Human Malignant Cells
T. A. ALCOSIER1, S. VAIRMA2, C. M. KHANING-RUSH1, S. J. SHIN2, and C. A. REINHART-KING1
1Cornell University, Ithaca, NY, 2Weill Cornell Medical College, New York, NY

Track: Cellular and Molecular Bioengineering
OP - Fri - 3 – 8 - Room 604

Translational Cellular and Molecular Biointering

Chairs: Charles Gersbach, Krishanu Saha

2:45PM
Endothelial Glycocalyx and Apoptosis in the Brachiocephalic Artery of a High Fat Fed ApoE/- Mouse
L. M. CANCEL1, E. E. EBONG1,2, and J. M. TARBEIl
1The City College of New York, New York, NY, 2Albert Einstein College of Medicine, New York, NY

3:00PM
Matrix Elasticity Controls Bone Formation by Stem Cells Deployed from Void-Forming Hydrogels
H. H. LEE1, K. LEE1, M. MEHTA2, C. M. MA2, M. M. XU2, X. ZHAO1, O. CHAUDHURI1, W. KIM1,2, K. ALIM2, A. MAMMOTO1,2, D. E. INGBER1,2, G. DUDA1,2, and D. J. MOONEY1
1Harvard University, Cambridge, MA, 2Harvard-MIT Division of Health Sciences and Technology, Cambridge, MA, 3Duke University, Durham, NC, 4Chung-Ang University, Seoul, Korea, Republic of, 5Children’s Hospital, Boston, MA, 6Julius Wolff Institute, Charite, Berlin, Germany
Track: Orthopaedic and Rehabilitation Engineering
OP - Fri - 3 – 9 - Room 611
Rehabilitation and Human Applications
Chairs: David Corr, Spencer Lake

2:45PM
Contact Mechanics in Normal, Dysplastic and Retroverted Human Hips
C. R. HENAK1, A. E. ANDERSON1, M. D. HARRIS1, E. D. RICHTER1, B. J. ELLIS1, C. P. PETERS1, AND J. A. WEISS1
1University of Utah, Salt Lake City, UT, 2University of Denver, Denver, CO, 3University of California, San Diego, La Jolla, CA

3:00PM
Thoracic Pedicle Dimensions: Variation in Normal and AIS Pediatric Subjects
J. R. PETERS1, C. CHANDRASEKARAN1, L. WALTZ1, AND S. BALASUBRAMANIAN1
1Drexel University, Philadelphia, PA

3:15PM
Design of a 16-bit Custom Waveform Spinal Stimulation
T. MARTIN1, S. UPHURCH1, R. KEYNOS1, S. HARKE1, R. EDGERTON1, J. BURDICK1, AND J. NABER1
1University of Louisville, Louisville, KY, 2University of California, Los Angeles, Los Angeles, CA, 3California Institute of Technology, Pasadena, CA

3:30PM
Dynamic Gait Training on Body Weight Support and Weight Training for People with Spinal Cord Injury
C. GARCZ1, A. C. GRUETER1, F. V. CARVALHO1, AND R. A. DE SOUZA1
1INATEL, S. Rita Do Sapucai, Brazil

Track: Device Technologies and Biomedical Robotics
OP - Fri - 3 – 10 - Room 602
Implantable Orthopedic Devices and Assistive Technologies
Chairs: David Kaplan, Tingrui Pan

2:45PM
Controlling Stand-to-Sit Maneuver after Spinal Cord Injury Using a Hybrid Neuroprosthesis
S. R. CHANG1, R. KOBETC1, AND R. J. TRIOLI2
1Case Western Reserve University, Cleveland, OH, 2Louis Stokes Cleveland VA Medical Center, Cleveland, OH

3:00PM
Droplet-Based Pressure Sensor Array for Artificial Skin Application
B. NIE1, R. LI1, J. D. BRANDY1, AND T. PAN1
1University of California, Davis, Davis, CA, 2University of California, Davis, Sacramento, CA

3:15PM
Soft Exo-Skeletal Arm for C4-C5 Trauma Induced Spinal Cord Injuries
M. BRAUDDW1, E. CALAMARI1, S. LJKIND1, B. LEONE1, C. MOLICA1, A. PISCORIELLO1, W. TERRY1, M. A. DELPY1, E. TORRES-JARA1, M. B. POPVIC1, E. A. CLANCY1, AND G. S. FISCHER1
1Worcester Polytechnic Institute, Worcester, MA

3:30PM
R-ARM: Robotic Assistive Reaching Mechanism
M. NOJOOMI1, S. GONZALEZ1, N. MITTAL1, AND A. SATRIK1
1Rice University, Houston, TX

Track: Bioinformatics, Computational and Systems Biology
OP - Fri - 3 – 11 - Room 615
Image-Based Modeling
Chairs: Michael Hawrylycz, Christopher R. Johnson

2:45PM
A High Resolution Spatiotemporal Atlas of Gene Expression of the C57Bl/6 Developing Mouse Brain (Invited)
M. HAWRYLYCZ1, L. NOG1, AND C. THOMPSON1
1Allen Institute for Brain Science, Seattle, WA

3:15PM
Image-Based Biomedical Modeling, Simulation, and Visualization (Invited)
C. R. JOHNSON1
1University of Utah, Salt Lake City, UT

Track: Biomedical Engineering Education
OP - Fri - 3 – 12 - Room 616
Innovative Hands on Approaches
Chairs: Damir Khismatullen, Alyssa Taylor

2:45PM
Integrating 3D Additive Manufacturing Technologies into a Tissue Engineering Lab Course
A. W. FEINBERG1
1Carnegie Mellon University, Pittsburgh, PA

3:00PM
An Active Learning Approach to Developing Manufacturing Literacy in Biomedical Engineering Students
J. R. GOLDBERG1
1Marquette University, Milwaukee, WI

3:15PM
Integrating Practical Instrumentation Control Skills Into a Laboratory Module Teaching the Fundamentals of Ultrasound Imaging
T. E. ALLEN1
1University of Virginia, Charlottesville, VA

3:30PM
Implementation of Flipped Classroom Model in Medical Electronics Course
J-M. MAINE1
1University of Southern California, Los Angeles, CA
Track: Biomedical Imaging and Optics
OP - Fri - 3 – 13 - Room 618

MRI Methods and Applications

Chairs: Walter O'Dell

2:45PM
A Hybrid Method for Automatic Reconstruction of 3D Tissue Displacement Fields from MRI
A. D. GOMEZ1, S. S. MERCHANT2, and E. W. HSU3
1University of Utah, Salt Lake City, UT

3:00PM
Optimizing MRI Pulse Parameters for T1 Estimation to Minimize the Cramer-Rao Lower Bound
Y. LIU1, J. R. BUCK1, and V. N. IKONOMIDOU2
1University of Massachusetts Dartmouth, North Dartmouth, MA, 2George Mason University, Fairfax, VA

3:15PM
Genetically Engineered Molecular Sensors for Non-Invasive Imaging of Glutamate in MRI
G. L. SUN1, D. V. SCHAFER1, and M. G. SHAPIRO1
1University of California, Berkeley, Berkeley, CA

3:30PM
In Vivo Monitoring of Chondrogenic Differentiation in a Biomimetic ECM-Incorporated Scaffold via MRI
A. YE1, Z. YIN1, T. K. YASARI1, A. KHAN1, and R. MAGIN1
1University of Illinois at Chicago, Chicago, IL

Track: Nano to Micro Technologies
OP - Fri - 3 – 14 - Room 619

Manobio interfaces III

Chairs: Edward Botchwey, Dal-Hee Min

2:45PM
Engineered MicrOScale Flagellar Motion Powered by Cardiomyocytes
B. J. WILLIAMS1, S. V. ANAND2, and T. SAIFF3
1University of Illinois at Urbana-Champaign, Urbana, IL

3:00PM
Using Microfluidics to Evaluate the Differential Effect of SIP Receptor Targeting Drugs on Endothelial Cell Sprouting
A. DAS1, S. LENZ1, and E. BOTCHWEY2
1University of Virginia, Charlottesville, VA, 2Georgia Institute of Technology, Atlanta, GA

3:15PM
Development of Graphene Oxide Based Multiplexed Helicase Activity Assay Platform for Anti-viral Drug Screening
H. JANG1, S-R. RYOO1, and D-H. MIN1
1Seoul National University, Seoul, Korea, Republic of

3:30PM
Controlling Cell Shape in Three Dimensions with Microfabricated Protein Matrices
C. MORAES1, B. KIM1, X. ZHU1, K. MILLS1, A. R. DIXON1, M. D. THOULESS1, and S. TAKAYAMA1
1University of Michigan, Ann Arbor, MI

Track: Respiratory Bioengineering
OP - Fri - 3 – 15 - Room 620

Surfactants and Mucus

Chairs: Donald Gaver, Carrie Perlman

2:45PM
The Unusual Symmetric Reopening Effect Induced by Pulmonary Surfactant
E. YAMAGUCHI1, M. J. GIANNETTI2, M. J. VAN HOUTEN3, O. FOROUGAN1, S. S. SHEVKOPLIYAS3, and D. P. GAVER1
1Tulane University, New Orleans, LA

3:00PM
Fluid Dynamics of Mucus Plug Rupture
Y. HU1, S. BIAN1, S. TAKAYAMA1, and J. B. GROTBER1
1University of Michigan, Ann Arbor, MI

3:15PM
Simulations Identify Optimal Mechanical Ventilation Parameters for Surfactant Uptake in Occluded Pulmonary Airways
J. E. PILLERT1, H. FUJIOKA1, D. HALPERN2, and D. P. GAVER3
1Tulane University, New Orleans, LA, 2University of Alabama, Tuscaloosa, AL

3:30PM
Direct Surfactant Application in Edematous Alveoli Lowers Ventilation Injury
Y. WU1 and C. E. PERLMAN1
1Stevens Institute of Technology, Hoboken, NJ

Track: Neural Engineering
OP - Fri - 3 – 16 - Room 613

Deep Brain Stimulation

Chairs: Chuck Alan Dorval, Matthew Johnson

2:45PM
Computational Modeling of an Intracranial Transvascular Approach to Neural Stimulation
B. A. TEPLITZY1, A. T. CONNOLLY1, J. A. BAJWA2, and M. D. JOHNSON3
1University of Minnesota, Minneapolis, MN, 2National Neuroscience Institute, King Fahad Medical City, Saudi Arabia

3:00PM
Neurolgal Circuit Dynamics in Simulated Deep Brain Stimulation
V. TIRUVAD1,2
1Emory University School of Medicine, Atlanta, GA, 2Georgia Institute of Technology, Atlanta, GA

3:15PM
Cost Efficient Animal Tracking System Used for the Study of Beta and Gamma Waves from Primary Motor Cortex During Movement in Parkinsonian Rats
C. POLAR1 and A. D. DORVAL1
1University of Utah, Salt Lake City, UT

3:30PM
Neural Information in Globus Pallidus Degrades with Increasing Parkinsonian Severity
A. D. DORVAL1, A. L. JENSEN2, K. B. BAKER2, and J. L. VITEK2
1University of Utah, Salt Lake City, UT, 2University of Minnesota, Minneapolis, MN
Saturday, September 28, 2013

8:00AM – 9:30AM
PLATFORM SESSION – SAT – I

Track: Tissue Engineering

OP - Sat - 1 – 1 - Room 6B

Musculoskeletal and Orthopedic Tissue Engineering II

Chairs: Alejandro Jose Almarza, Robert Mauck

8:00AM
Bioactive Microsphere-Incorporated Cartilage Sheets for Treatment of Rabbit Osteochondral Defects
L. D. SOLORIO1, C. W. CHENG1, D. CORREA1, L. M. PHILLIPS1, and E. ALSBERG2
1Case Western Reserve University, Cleveland, OH

8:15AM
Preclinical Assessment of Mesenchymal Stromal Cell (MSC) Transplantation to Treat Type II (age-related) Osteoporosis
J. J. KIERNAN1, J. E. DAVIES1, and W. L. STANFORD1, 2
1University of Toronto, Toronto, ON, Canada, 2Ottawa Hospital Research Institute, Ottawa, ON, Canada

8:30AM
Tissue-Engineering of Functional Human Skeletal Muscle
L. R. MADDEN1, M. JUHAS1, C. CHENG1, W. E. KRAUS1, G. A. TRUSKEY1, and N. BURSAC1
1Duke University, Durham, NC

8:45AM
MicroRNA-133a and MicroRNA-696 Joint Inhibition Increases Specific Force Output of Tissue-Engineered 3D Human Skeletal Muscle Constructs
C. S. CHENG1, L. MADDEN1, W. E. KRAUS1, N. BURSAC1, and G. A. TRUSKEY1
1Duke University Biomedical Engineering, Durham, NC, 2Duke University Medical Center, Durham, NC

9:00AM
Effects of Mild Heating on the Osteogenesis of Mesenchymal Stem Cells During Inflammation
K. SUNDERIC1, D. DAWKINS1, and S. WANG1
1City College of New York, New York, NY

9:15AM
Tissue Engineering Cartilage Using Naturally Derived Multi-Layer ECM Scaffolds
A. CALLANAN1, 2, S. MCCULLEN1, J. STEELE1, R. NAI1, and M. M. STEVENS1
1Departments of Materials and Biomechanics, Institute of Biomedical Engineering, Imperial College London, London, United Kingdom, 2Institute for Materials and Processes, School of Engineering, University of Edinburgh, Edinburgh, United Kingdom

Track: Tissue Engineering

OP - Sat - 1 – 2 - Room 6C

Tissue Engineered Models for Study of Disease and Drug Discovery II

Chairs: Darja Marolt, Walter L. Murfee

8:00AM
Co-culture Model of Tumor Metastasis Reveals Short-Range Paracrine Interactions
K. H. SPEICHER1 and E. E. HUI1
1University of California-Irvine, Irvine, CA
8:15AM
Development of Hydrogel Scaffolds for Studying Glioblastoma Multiforme Invasion in 3D
R. W. SIRINANN\textsuperscript{1,2}, J. M. HEFFERNAN\textsuperscript{1,2}, and D. J. OVERSTREET\textsuperscript{1}
\textsuperscript{1}Barrow Neurological Institute, Phoenix, AZ; \textsuperscript{2}Arizona State University, Tempe, AZ

8:30AM
The Use of Wicking Fibers to Distinguish Cell Types
S. TABBA\textsuperscript{3} and K. J. BURG\textsuperscript{1}
\textsuperscript{1}Clemson University, Clemson, SC

8:45AM
In Vitro Fabrication of Scaffold-Free Skeletal Muscle Tissue with Defined 3D Structure Using a Thermoresponsive, Nanotopographically-Defined Platform
A. JIAO\textsuperscript{1}, N. E. TROSPER\textsuperscript{1}, J. H. TSUI\textsuperscript{1}, D-H. KIM\textsuperscript{1}, and C. E. MURRY\textsuperscript{1}
\textsuperscript{1}University of Washington, Seattle, WA

9:00AM
Computational Modeling and Mechanical Stimulation for Enhanced Bioengineered Skin Mechanics
B. N. BLACKSTONE\textsuperscript{1}, F. SHEEP\textsuperscript{1}, S. N. GHADIALI\textsuperscript{1}, and H. M. POWELL\textsuperscript{1}
\textsuperscript{1}The Ohio State University, Columbus, OH

9:15AM
In Vitro Tumor Model Generated Using a Flow Perfusion Bioreactor
M. SANTORO\textsuperscript{1}, S-E. LAMHAMEDI CHERRADI\textsuperscript{2}, F. K. KASPER\textsuperscript{1}, J. A. LUDWIG\textsuperscript{1}, and A. G. MIKOS\textsuperscript{1}
\textsuperscript{1}Rice University, Houston, TX; \textsuperscript{2}University of Texas MD Anderson Cancer Center, Houston, TX

Track: Biomaterials
OP - Sat - 1 – 3 - Room 606

Biomaterials for Controlling Cell Environment I

8:00AM
Biomaterials for Intelligently Manipulating Cells (Invited)
B. RATNER\textsuperscript{1}
\textsuperscript{1}University of Washington, Seattle, WA

8:30AM
Engineered 3D Hybrid Hydrogels Simulate Early Calcific Aortic Valve Disease
J. HJORTNAES\textsuperscript{1}, G. CAMCI-UNAL\textsuperscript{1,4}, C. GOETTSCH\textsuperscript{4}, K. SCHERER\textsuperscript{1}, L. LAX\textsuperscript{1}, F. J. SCHOPEN\textsuperscript{1}, J. KLINT\textsuperscript{5}, E. AIKAWA\textsuperscript{6,7}, and A. KHADMERSIENSE\textsuperscript{1,4}
\textsuperscript{1}Center of Excellence in Vascular Biology, Department of Medicine, Brigham and Women’s Hospital, Boston, MA; \textsuperscript{2}Department of Cardiac Surgery, University Medical Center Utrecht, Utrecht, Netherlands; \textsuperscript{3}Division of Biomedical Engineering, Brigham and Women’s Hospital, Harvard Medical School, Cambridge, MA; \textsuperscript{4}Harvard-MIT Division of Health Sciences and Technology, MIT, Cambridge, MA; \textsuperscript{5}Center for Interdisciplinary Cardiovascular Sciences, Brigham and Women’s Hospital, Boston, MA; \textsuperscript{6}Department of Pathology, Brigham and Women’s Hospital, Harvard Medical School, Boston, MA

8:45AM
Tuning PEG Hydrogel Mechanics Independent of Density to Control Tubulogenesis
R. M. SCHWELLER\textsuperscript{3} and J. L. WEST\textsuperscript{1}
\textsuperscript{1}Duke University, Durham, NC

9:00AM
Dynamic and Reversible Surface Topography Influences Cell Morphology
J. D. KIANG\textsuperscript{1}, J. H. WEN\textsuperscript{1}, J. C. DEL ALAMO\textsuperscript{1}, and A. J. ENGLER\textsuperscript{1,2}
\textsuperscript{1}UC San Diego, La Jolla, CA; \textsuperscript{2}Sanford Consortium for Regenerative Medicine, La Jolla, CA

9:15AM
PEG-based, Crosslinkable Microribbons for Forming Macroporous Scaffolds with Decoupled Biochemical and Mechanical Properties
L-H. HAN\textsuperscript{1}, X. TONG\textsuperscript{1}, and F. YANG\textsuperscript{1}
\textsuperscript{1}Stanford University, Stanford, CA

Track: Biomechanics
OP - Sat - 1 – 4 - Room 607

Computer-Aided Biomechanical Analysis

8:00AM
Finite Element Fluid-Solid Interaction Simulation of Pulse Wave Propagation on Human Abdominal Aortic Aneurysm
D. SHAHMRZADI\textsuperscript{1}, I. JOURARD\textsuperscript{1}, and E. E. KONOFAGIOU\textsuperscript{1}
\textsuperscript{1}Columbia University, New York, NY

8:15AM
Finite Element Analysis of the Lower Extremity Due to Anti-Vehicle Blasts
R. BERTUCCI\textsuperscript{1}, R. PRABHU\textsuperscript{1}, M. F. HORSTMEMEYER\textsuperscript{1}, J. SHENQ\textsuperscript{1}, J. LIAO\textsuperscript{1}, and L. N. WILLIAMS\textsuperscript{1}
\textsuperscript{1}Mississippi State University, Mississippi State, MS; \textsuperscript{2}U.S. Army Tank Automotive Research, Development and Engineering Center, Warren, MI

8:30AM
Measurement of Skin Deformation of the Breast associated with Position Change through 3D Digital Image Correlation
H. KHATAMI\textsuperscript{1}, M. C. FINGERLEY\textsuperscript{1}, G. P. REECE\textsuperscript{1}, M. K. MARKEY\textsuperscript{1}, and K. RAY-CHANDAR\textsuperscript{1}
\textsuperscript{1}University of Texas at Austin, Austin, TX; \textsuperscript{2}MD Anderson Cancer Center, Houston, TX

8:45AM
Inverse Finite Element Modeling for Viscoelastic Biomechanical Properties of Spinal Cord
M. B. PANZER\textsuperscript{1}, B. R. BIGLER\textsuperscript{1}, A. W. YU\textsuperscript{1}, N. M. KLOPPENBORG\textsuperscript{1}, C. R. BASS\textsuperscript{1}, G. R. PASKOFF\textsuperscript{1}, and B. S. SHENDER\textsuperscript{1}
\textsuperscript{1}Duke University, Durham, NC; \textsuperscript{2}NAVIR, Patuxent River, MD

9:00AM
Primary Blast-Induced Ocular Trauma
M. A. REILLY\textsuperscript{1}, D. SHERWOOD\textsuperscript{1}, R. WATSON\textsuperscript{1}, B. J. LUND\textsuperscript{1,2}, W. E. SPOKSE\textsuperscript{1,2}, K. THOE\textsuperscript{1}, R. D. Glickman\textsuperscript{1,2}, and W. GRAY\textsuperscript{1}
\textsuperscript{1}University of Texas at San Antonio, San Antonio, TX; \textsuperscript{2}Bodyodynamic Research Corporation, San Antonio, TX; \textsuperscript{3}US Army Institute of Surgical Research, San Antonio, TX; \textsuperscript{4}WESPA, San Antonio, TX; \textsuperscript{5}University of Texas Health Science Center at San Antonio, San Antonio, TX

9:15AM
Multiscale Model of Shear Induced Platelet Activation and Pseudopod Formation
S. POTHAPRAGADA\textsuperscript{1}, P. ZHANG\textsuperscript{1}, M. LIVELLI\textsuperscript{1}, J. SHERIFF\textsuperscript{1}, Y. DENG\textsuperscript{1}, and D. BLUESTEIN\textsuperscript{1}
\textsuperscript{1}Stony Brook University, Stony Brook, NY

Track: Stem Cell Engineering
OP - Sat - 1 – 5 - Room 608

Directing Stem Cell Differentiation

8:00AM
Mesenchymal Morphogenesis of Embryonic Stem Cells Modulates the Dynamics of 3D Multicellular Mechanics (Invited)
M. KINNEY\textsuperscript{1}, R. SAEED\textsuperscript{1}, and T. C. MCDONEL\textsuperscript{1}
\textsuperscript{1}Georgia Institute of Technology, Atlanta, GA
**8:00AM-9:30AM PLATFORM SESSIONS Sat-1**

2013 | SEPTEMBER 28 | SATURDAY

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**8:30AM**

Novel and Scalable Derivation of Neuroepithelium and Ventral Progenitors of Defined Spinal Cord Position

E. S. Lippmann, M. Estevé-Silva, and R. S. Ashton

*University of Wisconsin, Madison, WI*

**8:45AM**

Defined Extracellular Matrix Components are Necessary for -cell Precursor Induction

H. Taylor-Weiner, J. E. Schwarzbauer, and A. J. Engler

*University of California, San Diego, La Jolla, CA; Princeton University, Princeton, NJ*

**9:00AM**

Intramuscular Myofibers from Human Stem Cells and Their Innervations by Human Sensory Neurons

X. Guo, S. Spradling, A. Mazza, S. Lambert, and J. J. Hickman

*University of Central Florida, Orlando, FL*

**9:15AM**

Directed In Vitro Myogenesis of Human Embryonic Stem Cells and Their In Vivo Engraftment (Invited)

Y. Huang

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

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**Track: Cardiovascular Engineering**

**OP - Sat - 1 – 7 - Room 612**

**Vascular Mechanics II**

Chairs: Jane Grande-Allen, Elisa Konofagou

**8:00AM**

Phenotypic Diversity of Cells within the Intraluminal Thrombus and Vascular Wall of Abdominal Aortic Aneurysm

B. N. Brown, J. Rao, E. L. Opstun, J. D. Humphries, and D. A. Vorip

*University of Pittsburgh, Pittsburgh, PA; Yale University, New Haven, CT*

**8:15AM**

Aortic Valve Morphology Predicts Spatially-Distinct Fiber Architecture in Ascending Aortic Aneurysm


*University of Pittsburgh, Pittsburgh, PA; Fondazione Ri.MED, Palermo, Italy*

**8:30AM**

Multi-Modality Imaging of Type-B Aortic Dissection Using a Novel Hemodynamic Model


*Methodist DeBakey Heart & Vascular Center, Houston, TX*

**8:45AM**

Mechanical Model on Role of “Radially-Running” Collagen in Dissection Properties of Ascending Aorta

S. Pal, A. Tsamis, S. Pasta, A. D’Amore, T. G. Gleason, and S. Maiti

*University of Pittsburgh, Pittsburgh, PA; Fondazione Ri.MED, Palermo, Italy*

**9:00AM**

Prediction of Stretch and Wall-Shear Stress Abnormalities in the Bicuspid Aortic Valve Ascending Aorta

K. Cad and P. Sucsky

*University of Notre Dame, Notre Dame, IN*

**9:15AM**

The Role of Bicuspid Aortic Valve Hemodynamics in the Development of Acute Aortic Dilation

S. Ratley, K. Cad, L. Sun, and P. Sucsky

*University of Notre Dame, Notre Dame, IN*

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**Track: Cellular and Molecular Bioengineering**

**OP - Sat - 1 – 8 - Room 604**

**Cell Biomechanics I**

Chairs: Adam Engler, Jeffrey Jacot

**8:00AM**

Single Cell Traction Microscopy within 3D Collagen Matrices

M. S. Hall, K. Feng, Y. Huang, R. Long, C. Y. Hui, and M. Wu

*Cornell University, Ithaca, NY; University of Alberta, Edmonton, AB, Canada*
8:15AM
TGF-β1 Induced Stiffening of Mesenchymal Stem Cells Depends on PDGF-BB Signaling
D. Ghosh1, L. Lilli1, D. McGrail1, L. V. Matyunina1, J. McDonald1, and M. R. Dawson1
1Georgia Institute of Technology, Atlanta, GA

8:30AM
Focal Adhesion Dynamics Coupled with Cytoskeletal Stresses and Reorganization Under Flow
D. Verma1, F. Meng1, and S. Z. Hua1
1State University of New York at Buffalo, Buffalo, NY

8:45AM
Cellular Force Modulation Through Zyxin Rearrangement in a Fused-fiber Nanonet Environment
C. Ng1, B. Koons1, and A. S. Nain1
1Virginia Tech, Blacksburg, VA

9:00AM
A Multiscale Framework for Modeling and Investigating Cell Mechanics in 3D Extracellular Matrix Environments
V. Rajagopal1, Q. Zhang1, and R. D. Kam1,2
1Singapore-MIT Alliance for Research and Technology Center, Singapore, Singapore, 2University of Cambridge, Cambridge, MA

9:15AM
Live-Cell Subcellular Study of Force-Mediated Focal Adhesion Morphogenesis Using Elastomeric Micropost Force Sensors
S. Weng1 and J. Fu1
1University of Michigan, Ann Arbor, MI

Track: Nano to Micro Technologies
OP - Sat - 1 – 10 - Room 602
Microphysiology Systems

8:00AM
Low-Voltage Electroosmotic Flow and DNA Shearing Using Ultrathin Nanoporous Silicon Membranes
T. Gaborski1, R. Carter1, J. Snyder2, and J. McGrath2
1Rochester Institute of Technology, Rochester, NY, 2University of Rochester, Rochester, NY

8:15AM
Hormone and Drug-Mediated Modulation of Glucose Metabolism in a Microscale Model of the Human Liver
M. Davidson1, M. Lehrer1, and S. Khetani1
1Colorado State University, Fort Collins, CO

8:30AM
Multiple Myeloma Cancer Niche Reconstructed by 3D Microfluidic Tissue Culture
W. Zhang1, J. Zilberberg1, D. Siegel1, H. Wang1, and W. Lee1
1Stevens Institute of Technology, Hoboken, NJ, 2Hackensack University Medical Center, Hackensack, NJ

8:45AM
Generating Physiological Microfluidic Flow Patterns with Magnetocaloric Sponges
S. Hong1, R. Yen1, G. A. Truskey1, and X. Zhao1
1Duke University, Durham, NC

9:00AM
Geometric Control of Hepatic and Vascular Engineered Tissue Architecture In Vivo
K. R. Stevens1, R. R. Chaturvedi1, J. D. Baranski2, R. E. Schwartz1, M. D. Ungrin1, J. S. Miller1, C. S. Chen1, and S. N. Bhatia1
1Massachusetts Institute of Technology, Cambridge, MA, 2University of Pennsylvania, Philadelphia, PA

9:15AM
Exclusion of CD45 from Vicinity of T Cell Receptor
J.-H. Lee1, M. L. Dustin2, and L. C. Kam1
1Columbia University, New York, NY, 2Skirball Institute of Biomolecular Medicine, New York, NY

9:54AM
Programmed Flows for Precise Solution Transfer Around Particles and Cells
D. E. Go1, E. Sollier1, H. Amini1, P. Sandoo2, and D. Di Carlo1
1UCLA, Los Angeles, CA

164 BMES 2013
Track: Bioinformatics, Computational and Systems Biology
OP - Sat - I – 11 - Room 615

Computational Bioengineering I

Chairs: Evrim Acar, Michael A. Saunders, Lawrence Sirovich

8:00AM
Structure-Revealing Data Fusion Model with Applications in Metabolomics (Invited)
E. ACAR1, A. J. LAVAEI2, M. A. RASMUSSEN1, and R. BRO1
1University of Copenhagen, Frederiksberg C, Denmark

8:30AM
Numerical Linear Algebra and Optimization Tools for Bioinformatics (Invited)
M. A. SAUNDERS1, S. AXLI1, D. MAI1, Y. SUN1, R. M. FLEMMING1, and I. TIELE2
1Stanford University, Stanford, CA, 2University of Luxembourg, Esch-sur-Alzette, Luxembourg

9:00AM
Reduction and Analysis of Large Scale Systems (Invited)
L. SIROVICH1
1Rockefeller University, New York, NY

Track: Biomedical Imaging and Optics
OP - Sat - I – 12 - Room 616

Vascular and Pulmonary Imaging

Chairs: Qifa Zhou

8:00AM
Permittivity Reconstructions of Perfusion in a Human Chest from EIT Data
C. N. LARA HERRERA1, J. MUELLER1, and R. GONZALEZ2
1Colorado State University, Fort Collins, CO, 2University of Sao Paulo, Sao Paulo, Brazil

8:15AM
Quantification of 3D Pulmonary Vascular Morphology in Pediatric Patients with Pulmonary Vascular Disease
W. O’DELL1, S. PRABHAKARAN1, and S. HEGGE1
1University of Florida, Gainesville, FL

8:30AM
In Vivo Detection of Hyperoxia-Induced Pulmonary Endothelial Cell Death Using 99mTc-Duramycin
S. H. AUDI1, E. R. JACOBS1, M. ZHAD1, S. T. HAWORTH1, D. L. ROERIG1, and A. V. CLOUGH1
1Marquette University, Milwaukee, WI, 2Zablocki VA Medical Center, Milwaukee, WI
3Northwestern University, Chicago, IL, 4Medical College of Wisconsin, Milwaukee, WI

8:45AM
Quantitative Measure of Remotely Detected Human Pulse in Visible Spectrum
B. KAUP1, V. A. HODGKIN1, J. A. HUTCHINSON1, J. K. NELSON1, and V. N. IKONOMIDOU2
1US Army Night Vision and Electronic Sensors Directorate, Fort Belvoir, VA, 2George Mason University, Fairfax, VA

9:00AM
Infrared Spectroscopy with PLS Regression Predicts Elastin Content in Aorta Samples
R. CHEHELJIAN1, J. RAO1, D. A. VORF1, M. KIANI1, and N. PLESHKO1
1Temple University, Philadelphia, PA, 2University of Pittsburgh, Pittsburgh, PA

9:15AM
Detection of Spinal Cord Ischemia Using a Novel Optical Monitor
A. D’SOUZA1, R. MESQUITA1, T. BLOOM1, R. GALLER1, A. YODH1, and T. FLOYD1
1SUNY Stony Brook, Stony Brook, NY, 2University of Pennsylvania, Philadelphia, PA

Track: Biomedical Imaging and Optics
OP - Sat - I – 13 - Room 618

Novel Approaches

Chairs: Richard Price

8:00AM
Tissue Fractionation by Ultrasonic Atomization
J. C. SIMON1, O. A. SAPIOZNIKOVA2, V. A. KHOKHLOVA1, Y. N. WANG1, L. A. CRUM1, and M. R. BAILEY1
1University of Washington, Seattle, WA, 2Moscow State University, Moscow, Russian Federation

8:15AM
Flow Cytometry as Dual Sizing and Shell Characterization Tool for Targeted and Non-Targeted Microbubbles.
C. PEREZ1, J. SWAIWELL1, J. TUP1, A. BRAZMAN1, and T. J. MATULA1
1Department of Bioengineering, University of Washington, Seattle, WA, 2Center for Industrial and Medical Ultrasound—Applied Physics Laboratory, University of Washington, Seattle, WA, 3Nanjing University, Nanjing, China, People’s Republic of

8:30AM
Nanocrystal Loaded Polymeric Microbubbles for Multimodal Imaging
N. TERAPHANGPHOM1, P. CHHOUR1, P. C. NAHA1, W. WITSCHUY1, D. P. CORMODE2, and M. A. WHEATLEY1
1Drexel University, Philadelphia, PA, 2University of Pennsylvania, Philadelphia, PA

8:45AM
Estimating Pedicle Screw Fastening Strength via a Virtual Modeling and Templating Technique for Spine Surgery Planning
C. A. LINTE1, J. CAMP1, K. AUGUSTINE1, D. HOLMES1, and R. ROBB1
1Mayo Clinic, Rochester, MN

9:00AM
Chemical Imaging of Human Breast Cancer Tissue Using ToF-SIMS
B. BLUESTEIN1, M. ROBINSON1, F. MRRISH1, D. HOCKENBERRY1, P. PORTER1, and L. J. GAMBLE1
1University of Washington, Seattle, WA, 2Fred Hutchinson Cancer Research Center, Seattle, WA

9:15AM
BioGames — A Crowd-Sourced Gaming Platform for Distributed Tele-pathology and Training of Experts
S. MARIANDLO1, S. FENG1, P. YU1, S. DIMITROV1, R. YU1, and A. OZCAN1
1University of California, Los Angeles, CA

Track: Drug Delivery
OP - Sat - I – 14 - Room 619

Targeted Delivery I

Chairs: Guillermo Ameer, Jian Yang

8:00AM
Hemodynamic Targeting of Atheroprone Vasculature for Diagnostic Imaging and Prophylactic Drug Delivery (Invited)
L. H. HOFMEISTER1, S. LEE1, W. CHEN1, T. GIROGIO2, D. HARRISON1, and H-J. SUNG1
1Vanderbilt University, Nashville, TN
8:30AM  
**Periventilatory Delivery of a Retinoid via Biodegradable Nanonets for the Inhibition of Neointimal Hyperplasia in Prosthetic Vascular Grafts**

J. Yang¹, K. Baler¹, J. J. Wang¹, J. Zhang¹, and G. A. Amert,²

¹Northwestern University, Evanston, IL, ²Northwestern University, Chicago, IL

8:45AM  
**Matrix Rigidity Controls Nanoparticle Uptake By Endothelial Cells via Alterations in Apical Membrane Mechanics**

C. Huang¹, P. J. Butler¹, S. Tong¹, H. S. Mudanja¹, G. Bao¹, and S. Zhang¹

¹The Pennsylvania State University, University Park, PA, ²Georgia Institute of Technology and Emory University, Atlanta, GA, ³University of California San Diego, La Jolla, CA

9:00AM  
**Bio-Inspired Approach to Avoid Mononuclear Phagocytic System Clearance in Systemic Treatments**

A. Parodi¹ and E. Tasciotti²

¹The Methodist Hospital Research Institute, Houston, TX

9:15AM  
**Elongated Viral Nanoparticles for Enhanced Thrombus Targeting**

A. M. Wen¹, Y. Wang¹, C. A. Yang¹, H. Gao¹,², D. I. Simon¹,², and N. F. Steinmetz¹

¹Case Western Reserve University, Cleveland, OH, ²University Hospitals Case Medical Center, Cleveland, OH

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**Track: Respiratory Bioengineering**

**OP - Sat - 1 – 15 - Room 620**

**Ventilation and Ventilation-Induced Injury**

**Chairs:** Kostantin Birokov, Rebecca Heise

8:00AM  
**Mechanical Induction of Group V Phospholipase A2 Causes Lung Inflammation and Acute Lung Injury**

A. A. Birukova¹, A. Y. Meliton¹, N. M. Munoz¹, A. R. Leff¹, and K. G. Birukov¹

¹University of Chicago, Chicago, IL

8:15AM  
**Inhibiting the Rho Kinase Pathway to Reduce Cell Injury and Inflammation During Cyclic Airway Reopening**

H. Higuita-Castro¹, K. Nelson¹, D. J. Hansford¹, and S. N. Ghadiali²

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

8:30AM  
**Computational Analysis of Dynamic Pressure-Volume Observations to Assess Lung Injury Status**

B. J. Smith¹ and J. H. Bates¹

¹University of Vermont, Burlington, VT

8:45AM  
**Quantifying Stress-Induced Pulmonary Epithelial Damage During Airway Reopening**

J. Ryan¹, H. W. Glindmeyer IV¹, J. Pillert², B. Smith², and D. P. Gaver III¹

¹Tulane University, New Orleans, LA, ²University of Vermont, Burlington, VT

9:00AM  
**Model-Based Estimation of Ventilatory Control Dynamics during Sleep in Pediatric Obesity**

L. Nava-Guerra¹, P. Chalacheva¹, W. Tran¹, S. Ward¹, T. Keens¹, and M. Khoo¹

¹University of Southern California, Los Angeles, CA, ²Children’s Hospital Los Angeles, Los Angeles, CA

9:15AM  
**The Effect of Age on the Severity of Ventilator Induced Lung Injury in an Aging Mouse Model**

J. Herbert¹, A. Venkatasubramanian¹, R. Pidaparti¹, A. Reynolds¹, and R. L. Heise¹

¹Virginia Commonwealth University, Richmond, VA

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**Track: Neural Engineering**

**OP - Sat - 1 – 16 - Room 613**

**Neural Engineering: From Basic Studies to Translation**

**Chairs:** Christopher Passaglia, Sarah Pixley

8:00AM  
**Magnesium Metal as a Scaffold for Peripheral Nerve Regeneration**

T. Hopkins¹, J. Vennebrewer¹, D. Minteer¹, K. Little¹, M. Hershcovitch¹, D. Hom¹, K. Marra¹, and S. K. Priley¹

¹University of Cincinnati, Cincinnati, OH, ²University of Pittsburgh, Pittsburgh, PA, ³Cincinnati Children’s Hospital, Cincinnati, OH

8:15AM  
**Development and Characterization of a System for High-Content Screening of Functional NMJs In Vitro**

A. S. Smith¹, C. J. Long¹, K. Phozi², and J. J. Hickman¹

¹University of Central Florida, Orlando, FL

8:30AM  
**Microparticles and Hydrogels for Delivery of Biomolecules into the Spinal Cord after Injury**

Z. Z. Khaing¹,², G. Plumton¹, P. Allen¹, A. Ellington¹, and C. E. Schmidt¹,²

¹The University of Texas at Austin, Austin, TX, ²University of Florida, Gainesville, FL

8:45AM  
**Ability of Polyphenols to Attenuate Alzheimer’s Disease by Reducing Nuclear Factor-kB Activation**

K. M. Pate¹, M. Rogers¹, J. Clegg¹, and M. A. Moss¹

¹University of South Carolina, Columbia, SC

9:00AM  
**Towards a System for Intraocular Pressure Regulation**

C. Passaglia¹, S. Bello¹, R. Tzekov¹,², and S. Malavade¹

¹University of South Florida, Tampa, FL, ²Roskamp Institute, Sarasota, FL

9:15AM  
**Thermal Mechanisms of Millimeter Wave Neural Stimulation**

M. G. Shapiro¹, M. F. Priest¹, P. H. Siegel¹, and F. Bezanilla¹

¹University of California at Berkeley, Berkeley, CA, ²University of Chicago, Chicago, IL, ³California Institute of Technology, Pasadena, CA
Track: Translational Biomedical Engineering
OP - Sat - I – 17 - Room 6A
Translational Therapeutics and Imaging

Chairs: Harvinder Gill, Kent Leach

8:00AM
Blockade of Placental Growth Factor/Neuropilin 1 Pathway Inhibits Growth and Spread of Medulloblastoma
T. Peterson1,2, M. Snuderl1,2, A. Batista1, N. Kirpatrick1,2, C. Ruiz de Almodovar1, L. Riedemann1,2, P. Carmeliet3, and R. Jain1,2
1Harvard Medical School, Boston, MA, 2Massachusetts General Hospital, Boston, MA, 3VIB-KU Leuven, Leuven, Belgium

8:15AM
Engineering Gene Targeting and Editing Molecules to Treat Monogenic Thalassemia Diseases
F. Reza1 and P. M. Glazer1
1Yale University, New Haven, CT

8:30AM
Living without Breathing: Intraperitoneal Administration of Oxygen Microbubbles Significantly Extends Life in Hypoxic Rodents
J. Feisthauer1, N. Legband2, B. Terry2, and M. Borden1
1University of Colorado, Boulder, CO, 2University of Nebraska, Lincoln, NE

8:45AM
Interactions of Peptide Triazoles and Gold Nanoparticle Conjugates with gp120 Induce Irreversible Inactivation of HIV-1 Virions
A. Rosemary Bastian1, M. Contarino1, K. Kimene1, K. Freedman1, C. Duffy1, and I. Chaiken1
1Drexel University, Philadelphia, PA

9:00AM
Gold Nanoparticle-M2e Conjugate as a Platform for Universal Influenza Vaccine
W. Tuo1, K. Ziemer2, and H. S. Gill1
1Texas Tech University, Lubbock, TX, 2Northeastern University, Boston, MA

9:15AM
Morphological Characterization to Inform Complex Surgical Decisions in Chronic Tetralogy of Fallot
A. S. Rao1 and P. G. Menon1
1University of Buffalo, State University of New York, Buffalo, NY, 2Carnegie Mellon University, Pittsburgh, PA

Track: Cellular and Molecular Bioengineering
OP - Sat - I – 18 - Room 6E
Molecular Bioengineering

Chairs: Matthew J. Lazzara, Casim Sarkar

8:00AM
Light Activated Protein Clustering and Signaling Activation in Mammalian Cells
L. Bugaj1, A. Goks1, C. Mesuda1, R. Kane2, and D. Schaffer1
1University of California Berkeley, Berkeley, CA, 2Rensselaer Polytechnic Institute, Troy, NY

8:15AM
Engineering Transcriptional Factor Runx2 to Target Vascular Calcification
T. M. Chen1, N. B. Nguyen1, K. V. Eaton1, C. M. Giachelli1, and M. Y. Speer1
1University of Washington, Seattle, WA

8:30AM
Developing And Screening A Library Of Activatable Recognition Proteins
S. K. Gupta1, R. Nguyen1, J. Gleixner1, L. Wentland1, A-Y. Tu1, and W. E. Thomas1
1University of Washington, Seattle, WA

8:45AM
Multivalent Ligands to Control Stem Cell Fate
A. Conway1 and D. V. Schaffer1
1University of California, Berkeley, CA

9:00AM
Modulating CSGP Biosynthesis in Reactive Astrocytes to Enhance Neuronal Regeneration
V. P. Swarup2, V. M. Tray1, M. Kalita1, M. V. Quintero1, V. Hlad1, and K. Balagurunathan1
1University of Utah, Salt Lake City, UT, 2University of Utah, Salt Lake City

9:15AM
Selective Dihydropryridines Inhibit Amyloid- Aggregation and Alter the Morphology of Amyloid- Aggregates Associated with Alzheimer’s Disease
J-H. Tseng1, J. Chapman1, and M. Moss1
1University of South Carolina, Columbia, SC
Saturday, September 28, 2013
9:30AM – 1:00PM
POSTER SESSION -SAT – A

Track: Biomechanics

Cellular and Molecular Biomechanics

P – Sat - A - 1
Biomechanical Modulation of Hepatocyte Dysfunction in Overly Produced ECM Microenvironment
S. SUN1, Z. SON2, and M. CHO1
1University of Illinois at Chicago, Chicago, IL

P – Sat - A - 2
Effects of Blocking Cell-Cell and Cell-Matrix Interactions on Mechanical Properties of Cardiomyocytes
A. DESAI1, S. BREITZ1, and D. DEAN1
1Clemson University, Clemson, SC

P – Sat - A - 3
Mechanical Properties of Bone Marrow and Adipose Stem Cells during Vascular Smooth Muscle Cell Differentiation
R. CHEN1 and D. DEAN1
1Clemson University, Clemson, SC

P – Sat - A - 4
The Effects of Different Size Nanoparticles on the Mechanical Properties of Vascular Smooth Muscle Cells
T. KIEU1, W. MCLLISTER1, K. KITCHEN1, and D. DEAN1
1Clemson University, Clemson, SC

P – Sat - A - 5
Schwann Cell Dynamics on Substrates of Varying Stiffness
C. LOPEZ-FASUNDO1, E. BARR-KOCHBA1, C. OH1, L. LI1, D. HOFFMAN-KIM1, and C. FRANCX1
1Brown University, Providence, RI

P – Sat - A - 6
Localized Lipid Packing of Transmembrane Domains Impedes Integrin Clustering
M. MEHRBOD2 and M. R. MOFID2
1University of California, Berkeley, Berkeley, CA

P – Sat - A - 7
Effect of Mounting Technique for Tissue Mechanics Measurements Using Atomic Force Microscopy
J. T. MORESTAN1, V. K. RAGHUNATH1, C. J. MURPHY1, and P. RUSSELL1
1University of California, Davis, Davis, CA

P – Sat - A - 8
Course-grained Molecular Dynamics Simulation of Diffusion and Vesiculation in Defective Erythrocyte Membrane
H. LI1 and G. LYKOTRAFITIS1
1University of Connecticut, Storrs, CT

P – Sat - A - 9
Modeling the Hydrodynamic Interaction and Lateral Migration of Circulating Cells in a Microchannel
H. LIAN1 and D. B. KHATMATULLIN1
1Tulane University, New Orleans, LA

P – Sat - A - 10
Development of Mechanical Stability of Primitive Erythroblasts During Mammalian Erythropoiesis
L. F. DELGADILLO1, Y. S. HUANG1, R. E. WAUGH1, and J. PALIS1
1University of Rochester, Rochester, NY, 2University of Rochester Medical Center, Rochester, NY

P – Sat - A - 11
Inhibition of Shear-sensitive MicroRNA, miR-712, Atypical MicroRNA Derived from Pre-ribosomal RNA, Decreases Endothelial Dysfunction and Atherosclerosis
D. J. SON1, S. KUMAR1, W. TAKABE1, C. KIM1,2, N. ALBERTS-GRILL1, J. W. SEO1, K. W. FERRARA1, and H. JO1,2
1Georgia Institute of Technology and Emory University, Atlanta, GA, 2Ewha womans University, Seoul, Korea, Republic of, 3University of California, Davis, Davis, CA

P – Sat - A - 12
In Vitro Model of Blunt Impact Injury
R. MCCulloch1 and T. O'Shaughnessy1
1Naval Research Laboratory, Washington, DC

P – Sat - A - 13
Altered Stiffness and Mechanical Response to Force on Integrins is a Consequence of TGF- Induced Epithelial to Mesenchymal Transition
L. D. OSBORNE1, G. L1, M. KARTHKEYAN1, E. O'BRIEN1, G. BLOB1,2, and R. SUPERFINE1
1University of North Carolina at Chapel Hill, Chapel Hill, NC, 2Duke University, Durham, NC

P – Sat - A - 14
Mechanical Factors Affect Fiber Alignment and Fibroblast Remodeling of Collagen and Fibrin Gels
A. M. DE JESUS1, Z. C. SEIKEL1,2, and E. A. SANDER1
1University of Iowa, Iowa City, IA

P – Sat - A - 15
Optimized Compliant In Vitro Models for Endothelial Mechanobiological Studies
P. TREMBLAY1, D. DUDE1, and L. ROULEAU1,2
1Université de Sherbrooke, Sherbrooke, QC, Canada, 2Centre hospitalier universitaire de Sherbrooke, Sherbrooke, QC, Canada

P – Sat - A - 16
Clathrin-coated Pit Dynamics in Response to the Geometry of the Adhesive Microenvironment
X. TAN1 and A. LIU1
1University of Michigan, Ann Arbor, MI

P – Sat - A - 17
Nanomechanics of Engineered, Native and Pellet Cartilage Tissues
C. R. QUENEBERRY1, A. NAZEMPUR1, B. VAN WIL1, and N. ABOULAIL1
1Washington State University, Pullman, WA

P – Sat - A - 18
Modeling the Structural Mechanics of Cilia and Flagella
M. GUY1 and G. XU1
1University of Central Oklahoma, Edmond, OK

P – Sat - A - 19
Influence of Mechanical Environment on Vascular Smooth Muscle Functional Contractility
K. E. STEUCKER1, P. A. VOIGT1, E. S. HALL1, and P. W. ALFORD1
1University of Minnesota, Minneapolis, MN

P – Sat - A - 20
The Contribution of Platelets to Clot Stiffness Through the Formation of Fibrin "Macro-Fibers"
M. J. PEREZ1, C. WANG1, B. HELMKE1, F. VIOLA1, and M. LAWRENCE1
1University of Virginia, Charlottesville, VA
P – Sat - A - 21
Identifying Key Paratope Residues and Their Partners in the Interface Between GPVI and 10B12 Through Molecular Dynamics Simulation
Y. FANG1, W. LIU1, AND J. WU1
1South China University of Technology, Guangzhou, China, People’s Republic of

P – Sat - A - 22
Platelet Control of Clot Stiffness Assessed by Microrheological Approaches
C. W. WANG1, M. PEREZ2, B. HELMKE1, AND M. LAWRENCE1
1University of Virginia, Charlottesville, VA

P – Sat - A - 23
Flexibility Serves as a Mechanical Regulator of Antimicrobial Activity for Amphipathic Cationic -Helical Antimicrobial Peptides
L. LIU1, Y. FANG1, AND J. WU1
1South China University of Technology, Guangzhou, China, People’s Republic of

P – Sat - A - 24
In Vitro Atomic Force Microscopy-based Analysis of Fibroblast-produced Type I Collagen
T. D. RICHARDSON1, J. HOLMAN1, AND J. M. WALLACE1,2
1Indianapolis University Purdue University Indianapolis, Indianapolis, Indiana, IN, 2Purdue University, West Lafayette, IN

P – Sat - A - 25
Photokinesis in Algae and Unanimated Microspheres. Do They Follow Different Mechanisms?
R. STAHLBERG1
1University of Washington, Seattle, WA

P – Sat - A - 26
Advanced Cell Culture Well for Mechanobiology
K. L. BILLIAR1, J. M. PRUDEN1, J. M. MANN1, D. GARCIA1, AND J. S. KELLEY1
1Worcester Polytechnic Institute, Worcester, MA

Track: Biomechanics

Neuromuscular Biomechanics and Physiology

P – Sat - A - 27
Development of an Involuntary Eccentric Contraction Training System
J. SON1, D. LEE1, AND Y. KIM1
1Yonsei University, Wajju, Korea, Republic of

P – Sat - A - 28
Neck Muscle Mechanical Demand During Tablet PC Use
A. N. VASAVADA1, D. D. NEVINS1, S. MONDAI1, AND D. C. LIN1
1Washington State University, Pullman, WA

Track: Biomechanics

Orthopaedic and Dental Biomechanics

P – Sat - A - 29
Facet Joint Response to Loading at High Frequencies
E. NOONAN1, H. SIDOTI1, A. RITTER1, T. ERRICO1, AND A. VALDEVI1
1Stevens Institute of Technology, Hoboken, NJ, *NYU Langone Medical Center, New York, NY

P – Sat - A - 30
Facet Joint Strain at Elevated Frequencies May be a Predisposition for Low-back Pain
H. SIDOTI1, E. NOONAN1, A. RITTER1, T. ERRICO1, AND A. VALDEVI1
1Stevens Institute of Technology, Hoboken, NJ, *NYU Langone Medical Center, New York, NY

P – Sat - A - 31
Facet Joint Stiffness Response to Loading Frequencies
R. CHUNG1, E. NOONAN1, H. SIDOTI1, A. RITTER1, T. ERRICO1, AND A. VALDEVI1
1Stevens Institute of Technology, Hoboken, NJ, *NYU Langone Medical Center, New York, NY

P – Sat - A - 32
Porcine Eye Response to Blast Overpressure
V. D. ALPHONSE1, A. R. KEMPER1, C. MCLANNY1, I. P. HERRING1, P. J. BROWN2, J. D. STITZEL1, AND S. M. DUMA1
1Virginia Tech, Blacksburg, VA, *Wake Forest University, Winston-Salem, NC

P – Sat - A - 33
Cadaveric Thumb-tip Forces Produced by Extrinsic and Intrinsic Thumb Muscles are More Sensitive to Joint Angles than Muscle Moment Arms and Bone Lengths
J. TOWLES1 AND V. HENTZ2
1University of Wisconsin-Madison, Madison, WI, 2Stanford University, Palo Alto, CA

P – Sat - A - 34
Influence of Age and Gender on Lumbar Impact Response and Injury Tolerance
S. D. SHIYADA1 AND N. MERRIER1
1Biomechanical Consultants of CA, Davis, CA

P – Sat - A - 35
Impact Response and Injury Tolerance Corridors of the Lumbar Spine
S. D. SHIYADA1 AND N. MERRIER1
1Biomechanical Consultants of CA, Davis, CA

P – Sat - A - 36
Comparison of One-Piece Metacarpophalangeal/Phalangeal Total Joint Replacements: A Computational and Numerical Study
A. C. WEEMS1 AND H. VO1
1Mercer University, Macon, GA

P – Sat - A - 37
Comparison of Surface Arthroplasty Metacarpophalangeal/Phalangeal Total Joint Replacements: A Computational and Numerical Study
A. C. WEEMS1 AND H. VO1
1Mercer University, Macon, GA

P – Sat - A - 38
The Biomechanical Effect of Different Screw Angle Configurations with Locking Compression Plates on Stability of Femoral Shaft Fracture Fixation
B. N. NGUYEN1, V. NGUYEN1, D. BAPTISTE1, AND H. V. VO1
1Mercer University, Macon, GA

P – Sat - A - 39
The Risk of Thoracic Injury in Direct Steering Wheel Impacts in Vehicles Equipped with Advanced Airbags
R. CHEN1 AND H. C. GABLER1
1Virginia Tech, Blacksburg, VA

P – Sat - A - 40
Structural and Morphologic Properties of the Mouse Femur are Rapidly Compromised by High Fat Diet
A. H. YANG1, B. NGUYEN1, B. ADLER1, E. M. CHAN1, AND C. Rubin1
1State University of New York at Stony Brook, Stony Brook, NY

P – Sat - A - 41
Contact Pressure/Area and Strain Distribution of Total Knee Arthroplasty Developed Newly for Reduction of a Risk of Failure
D. LIM1, Y. JANG1, P. HAN1, O. YOOP1, K-Y. LEE1, H. JUN1, AND J. KIM1
1Sejong University, Seoul, Korea, Republic of, 1Corentec Co., Ltd., Seoul, Korea, Republic of
P = Sat - A - 42
Evaluating Bending Stiffness Sensitivity through Parametric Models of the Human Ulna
B. GARVEN1, E. ELLERBROCK1, L. BOWMAN1, A. B. LOUCKS1, and J. R. COTTON1
1Ohio University, Athens, OH

P = Sat - A - 43
Effect of Coring Conditions on Temperature Rise in Bone
M. M. ISLAM1, R. HANSBERGER1, J. JAMES1, and X. WANG1
1University of Texas at San Antonio, San Antonio, TX

P = Sat - A - 44
Low Intensity Vibrations Improve the Compromised Bone Mechanical Property of Obese Mice, Potentially by Altering the Spatial Distribution of Bone Mineral Density
B. NGUYEN1, D. NGUYEN1, M. E. CHAN1, and C. RUBIN1
1Stony Brook University, Stony Brook, NY

P = Sat - A - 45
Evaluating Orthopedic Implants: A Comparative Study of LC-DCP/rod and CRIF/rod Fixation
C. A. DAVIS1, S. T. BAKER1, G. A. BONIN1, A. A. HILDEBRANDT1, D. A. HULSE1, S. C. KERNW1, W. B. SAUNDERS1, and M. R. MORENO1
1Texas A&M University, College Station, TX

P = Sat - A - 46
Development of Age and Gender-Specific Thorax Finite Element Models
S. L. SCHOLL1, A. A. WEAVER1, and J. D. STITZEL1
1Virginia Tech-Wake Forest University Center for Injury Biomechanics, Winston-Salem, NC

P = Sat - A - 47
Investigating the Effects of a Hyperbolic Expansion Section on Shock Tube Blast Testing
C. RZEZNIK1, K. MATTHEWS1, J. SHRIDHARANI1, G. WOOD1, B. BIGLER1, C. RICH1, M. B. PANZER1, and C. R. BASS1
1Duke University Injury Biomechanics Laboratory, Durham, NC, 2University of Virginia, Charlottesville, VA

Track: Cellular and Molecular Bioengineering

Cell Biomechanics

P = Sat - A - 48
Active Transport of Vesicles in Neurons is Modulated by Mechanical Tension
W. AHMID1 and T. SAIF1
1Univ of IL, Urbana, IL

P = Sat - A - 49
Elastic Stiffness of Glioblastoma Cells Migrating in Confined Microfluidic Channels
J. WRIGHT1, T. BLESENER1, S. BHATTARI1, R. BACHDO1, D. DAVE1, Y-T. KIM1, S. MOHANTY1, and C-J. CHUNG1
1University of Texas at Arlington, Arlington, TX, 2University of Texas Southwestern Medical Center, Dallas, TX

P = Sat - A - 50
Numeric Reconstruction Of Actin Networks From Substrate Displacements With A Topology Optimization Method
W. S. NISHIT1, R. C. CARBONARI1, and A. M. ALENCAR1
1Universidade do Sao Paulo, Sao Paulo, SP, Brazil, 2Universidade Federal do ABC, Santo Andre, SP, Brazil

P = Sat - A - 51
Nuclear Stiffening Inhibits Invasive Melanoma Cells
A. J. RIBERO1, P. KHANNA1, A. SUKUNAR1, K. N. DAHL1, and C. DONG1
1Carnegie Mellon University, Pittsburgh, PA, 2The Pennsylvania State University, University Park, PA

P = Sat - A - 52
How Cytoskeletal Forces Determine Nuclear Shape
D. B. LOVETT1, R. B. DICKINSON1, and T. P. LELE1
1University of Florida, Gainesville, FL

P = Sat - A - 53
CANCELLED BY AUTHOR

P = Sat - A - 54
Characterization of Molecular and Mechanical Phenotypes of Freshly Isolated Liposarcoma Cells
M. KANTILAL1 and E. M. DARLING1
1Brown University, Providence, RI, 2Brown University, Providence

P = Sat - A - 55
Spatial Control of Cell Seeding in 2-D Engineered Tissues
Z. WIN1, G. D. VILA1, E. N. SEVICK1, and P. W. ALFORD1
1University of Minnesota, Minneapolis, MN

P = Sat - A - 56
Responses of C2C12 Cells on Asymmetric Nanostructured Surfaces
Q. LIU1, J. JIANG1, X. LI1, X. S. WEI1, B. XP1, M. GRIGOL1, C. DYC1, P. WANG1, G. L. LUI1 and K. J. HSU1
1Zhejiang University, Hangzhou, China, People’s Republic of, 2University of Illinois at Urbana-Champaign, Urbana, IL, 3Tsinghua University, Beijing, China, People’s Republic of

P = Sat - A - 57
Oxidative Stress Comprised the Cytoskeleton Structure of Muscles Cells In Vitro
S. WONG1, K. K. LEE1, and A. F. MA1
1The Chinese University of Hong Kong, Hong Kong, Hong Kong

P = Sat - A - 58
Fibroblast Growth Factor-2 Did Not Restore Endothelial Cell Plasminogen Activator Levels
S. B. I. AN, J. L. HAK1, R. B. DUNN1, J. E. KIM1, and D. E. DUGAN1
1University of Minnesota, Minneapolis, MN

P = Sat - A - 59
Calcium Regulates Intracellular and Extracellular Cleavage of VWF by ADAMTS13
S. GOOGIA1, K. M. DAYANAND1, and S. NEELAMEGHAM1
1State University of New York at Buffalo, Buffalo, NY

P = Sat - A - 60
The Role of Chlamydia pneumonia Infection in Monocyte Biomechanics
A. K. SAHA1, S. J. EVANI1, T. GUARD1, and A. K. RAMASUBRAMANIAN1
1University of Texas at San Antonio, San Antonio, TX

P = Sat - A - 61
The Role of Furin Processing in Notch Signal Transduction Mechanics
S. RAVINDRANATH1, A. A. MUSS1, G. WUNDERER1, and E. BOTVINICK2
1University of California, Irvine, Irvine, CA, 2University of California, Los Angeles, Los Angeles, CA

P = Sat - A - 62
Venous Phlebitis: The Effect of Pressure Contact on Endothelial Cells Activation
D. WEISS1 and S. EINA2
1Tel Aviv University, Tel Aviv, Israel, 2Stony Brook University, Stony Brook, NY

P = Sat - A - 63
Using Microneedle Manipulation to Study Nuclear Envelopathies
G. R. FEDORCHAK1, M. KEITEM1, and J. LAMMERTING1
1Cornell University, Ithaca, NY, 2The Netherlands Cancer Institute, Amsterdam, Netherlands

P = Sat - A - 64
Substratum Stiffness Regulates Neurite Outgrowth: The Potential Involvement of Brain Zinc Finger proprotein 179
Y-T. HSIEH1, Y-C. LEE1, S-Y. CHOU1, and Y-K. WANG1
1Taipei Medical University, Taipei City, Taiwan

P = Poster Session
OP = Oral Presentation
Track: Cellular and Molecular Bioengineering

Molecular Bioengineering

P – Sat - A - 65
Reducing Nuclease I by Interphase Protrusion
L. HE1, W.-T. CHEN1, P.H. WU1, and D. WIRTZ1
1Johns Hopkins University, Baltimore, MD

P – Sat - A - 66
Actin Filaments Regulate Migration Time of Cells Through a Microfluidic Constriction Channel
V. SRINIVASARAGHAWAN1, H. BABAHOSSEINI1, E. M. SCHMELZ1, P. C. ROBERTS1, and M. AZAHI1
1Virginia Tech, Blacksburg, VA

P – Sat - A - 67
Elevated Sphingosine 1-phosphate Contributes to the Pathophysiology of Sickle Cell Disease
A. D. AVVIDJOJO1, P. KEELGAN1, F. AHMED1, M. O. PLATT1, and E. A. BOTCHNEY
1Georgia Institute of Technology, Atlanta, GA

P – Sat - A - 68
Confirmation-Dependent Inhibitory Binding of Green Tea Catechins to Amyloid-β in Alzheimer’s Disease
S. E. CHASTAIN1, K. PATZ1, and M. MOSS1
1University of South Carolina, Columbia, SC

P – Sat - A - 69
Simplicity of Design Principles underlying Tunable cis-Interactions within Shp2 Revealed
Y. WANG1 AND J. SUN1
1UCSD, La Jolla, CA, 2UIC, Urbana, IL

P – Sat - A - 70
Concatameric Nicotinic Acetylcholine Receptors to Study Receptor Mediated Internalization of Amyloid Beta Peptide
T. A. MURRAY1
1Louisiana Tech University, Ruston, LA

P – Sat - A - 71
Improved TALEN Performance with Changes in non-RVD, Repeat Amino Acids
Y. LIN1,2, T. J. CRADICK1, and G. BAO1
1Georgia Institute of Technology, Atlanta, GA, 2Emory University, Atlanta, GA

P – Sat - A - 72
Inactivation of the FokI Catalytic Domain of TALEN Monomer Can Reduce Nuclease Off-target Activity
C. J. ANTECH1, T. J. CRADICK1, H. DESHMUKH1, E. J. FINE1, E. KILDEECK1, M. H. PORTEUS1, D. B. ROTH1, and G. BAO1
1Georgia Institute of Technology, Atlanta, GA, 2Stanford University, Palo Alto, CA, 3University of Pennsylvania, Philadelphia, PA

P – Sat - A - 73
Developing Rationally Designed FRET-based Molecular Tension Sensors
B. D. HOFFMAN1, A. LACOHDE1, and M. A. SCHWARTZ2
1Duke University, Durham, NC, 2Yale University, New Haven, CT

P – Sat - A - 74
Ultraspecific DNA and RNA Hybridization Probes and Primers
D. Y. ZHANG1 and P. YIN2
1Rice University, Houston, TX, 2Harvard University, Boston, MA

P – Sat - A - 75
Electrical Potential Measurements of the Interfacealulk Water Complex Using a Hydrophilic Nanoflon Surface
R. DAS1
1University of Washington, Seattle, WA

P – Sat - A - 76
Increasing Sensitivity in Identifying TALEN Off-target Cleavage by Co-expression of Exonucleases
C. J. KRUEGER1, C. J. ANTICO1, E. J. FINE1, Y. LIN1, T. J. CRADICK1, and G. BAO1
1Georgia Institute of Technology, Atlanta, GA

P – Sat - A - 77
In Situ Site-specific Labeling and Bioconjugation of Recombinant Proteins Using N-myristsoyl Transferase and “Click” Chemistry
C. KULKARNI1,2, D. A. TIRRELL1, and T. L. KINZER-URSEM1,3
1California Institute of Technology, Pasadena, CA, 2Pfizer, Inc., Groton, CT, 3Purdue University, West Lafayette, IN

P – Sat - A - 78
Engineering Robust Control Over Two-component System Phosphotransfer Using Synthetic Protein Scaffolds and an Engineered Allosteric Histidine Kinase Switch
W. R. WHITAKER1, S. A. DAVIS1, A. P. ARRICK2,3, and J. E. DUEBER1,2
1UC Berkeley, Berkeley, CA, 2Lawrence Berkeley National Laboratory, Berkeley, CA

P – Sat - A - 79
Specific Interactions Underlie the Auto-inhibitory Mechanism of von Willebrand Factor A1 Domain
G. INTERLANDI1, O. YAKOVENKO1, A. TU1, and W. THOMAS1
1University of Washington, Seattle, WA

Track: Cellular and Molecular Bioengineering

Translational Cellular and Molecular Bioengineering

P – Sat - A - 80
Disrupted Levels of miR-103 during Obesity-induced Type II Diabetes in Parallel to Increased Glucose Intolerance and Low Intensity Vibration as a Potential Treatment
V. S. PATEL1, M. E. CHAN1, and C. T. RUBIN1
1Stony Brook University, Stony Brook, NY

P – Sat - A - 81
cAMP Diminishes Vascular Endothelial Growth Factor-induced Microvessel Hyperpermeability and Tumor Cell Adhesion via Reinforcing Endothelial Junction Strands
B. M. FU1, J. YANG2, S. SHEN2, B. CAI2, W. YEN2, L. ZHANG2, and M. ZENG1
1The City College of the City University of New York, New York, NY, 2University of Nevada, Las Vegas, Las Vegas, NV

P – Sat - A - 82
Development of FRET Technologies for Quantitative Systems Biology Research of SUMOylation Pathway
J. LIAO1, Y. SONO1,2, Y. LIU1,2, H. M. KUR1, A. N. SARVEDA1, and H. WIRYAWAN1
1University of California at Riverside, Riverside, CA, 2University of Pennsylvania, Philadelphia, PA, 3California Institute of Biomedical Research, La Jolla, CA

P – Sat - A - 83
Microinjection-based delivery of β-globin-targeting TALENs into K562 cells for gene modification
R. N. COTTL1, D. ARCHER1, and G. BAO1
1Georgia Institute of Technology, Atlanta, GA, 2Emory School of Medicine, Atlanta, GA
Poster Session Sat A 9:30 AM – 1:00 PM
Poster Viewing With Authors & Refreshment Break | 9:30 AM - 10:30 AM

Track: Cellular and Molecular Bioengineering

Cellular and Molecular Bioengineering

P - Sat - A - 86
Computational and Experimental Models of Microparticle Transport and Deposition
C. L. Hall1, Y-H. Lee2, and V. T. Turitto2
1The College of New Jersey, Ewing, NJ; 2Illinois Institute of Technology, Chicago, IL

P - Sat - A - 88
Immunization of Subunit Vaccine rAapG5 Protected Mice Against Staphylococcus epidermidis Implant Infections
L. Yan1 and J. Byers1
1University of Washington, Seattle, WA

Track: Tissue Engineering

Cell Delivery and Cell Homing Technologies

P - Sat - A - 98
Investigation of Hyaluronan-Methylcellulose Hydrogel as a Muscle Stem Cell Delivery Vehicle
S. Davoudi1 and P. M. Gilbert1
1University of Toronto, Toronto, ON, Canada

P - Sat - A - 97
Light Stimulated Control Release of Therapeutic Cells as Regenerative medicine
M. K. Bhuyan1, T. Boland2, and T. T. Tseng1
1Department of Mechanical Engineering, University of Texas at El Paso, El Paso, TX; 2Material Science and Biomedical Program, University of Texas, El Paso, El Paso, TX, TX, ‘Industrial, Manufacturing and System Engineering, University of Texas, El Paso, El Paso, TX

Advanced Cell-Scaffold-Bioreactor Systems for Tissue Engineering

P - Sat - A - 91
Incorporating Microchannels to Promote Cell Migration through Stacked Electrospun Scaffolds
C. M. Cohn1, R. Nohrrix1, K. Rundel1, S. L. Leung1, and X. Wu1
1University of Arizona, Tucson, AZ; 2Tucson Magnet High School, Tucson, AZ

P - Sat - A - 92
Compressive Bioreactor Based Engineering of Ex Vivo Derived TMJ Disc Graft: Comparison of Three Defined Stimulation Profiles Efficacy to Modulate Cellular Integration and Functionalization
C. M. Jurian1 and P. S. Mcthereid1
1University of Florida, Gainesville, FL

P - Sat - A - 93
Fortified Nanofibrous Tubular Scaffold Made by Combination of Electrospinning and Rapid Prototyping
M-J. Oh1, S. Park2, S. Park1, Y. Kang1, J-S. Hyun1, J-W. Shin1, and J-W. Shin1,2
1Department of Biomedical Engineering, Inje University, Gimhae, Korea, Republic of; 2Korea Institute of Machinery and Materials (KIMM), Daegu, Korea, Republic of; ‘First Research Team/Inst. of Aged Life Redesign/Cardiovascular and Metabolic Disease Center/UHRC, Inje University, Gimhae, Korea, Republic of

P - Sat - A - 94
Engineering Bone Tissue Constructs using Hydroxyapatite-doped, hMSC Encapsulated, Alginate Beads
M. O. Wang1, J. A. Thompson1, and J. P. Fisher1
1University of Maryland College Park, College Park, MD

P - Sat - A - 95
D. Alzebeh1 and H. Matthew1
1Wayne State University, Detroit, MI

P - Sat - A - 96
Tetra-PEG Cartridges for Cell Encapsulation
Y. Hedo1, S. Iwana1, and S. Takeuchi1
1The University of Tokyo, Tokyo, Japan

Track: Tissue Engineering

Neural Tissue Engineering (Brain, Motor Neurons, eye)

P - Sat - A - 99
Bioactive Borate Glass for Nerve Regeneration
L. M. Marquardt1, D. Day1, S. E. Sato-Nara-Elbert2, and A. B. Harkins1
1Washington University in St. Louis, St. Louis, MO; 2Missouri University of Science and Technology, St. Louis, MO, ‘Saint Louis University, St. Louis, MO

P - Sat - A - 100
Restoring Brain Circuitry Using Micro-Tissue Engineered Neural Networks
L. Strausyn1, J. Wolf2, C. Mietus1, J. Morand1, and D. K. Cullen1
1University of Pennsylvania, Philadelphia, PA

P - Sat - A - 101
Extended Protein Release from Microspheres Incorporated in Electrospun HA to Support Nerve Repair
T. Whitehead and H. Sundaramahajan
1Wayne State University, Detroit, MI

P = Poster Session
OP = Oral Presentation

University of Florida, Gainesville, FL

Milwaukee School of Engineering, Milwaukee, WI

Wayne State University, Detroit, MI

University of Texas, El Paso, El Paso, TX

Georgia Institute of Technology, Atlanta, GA

University of Washington, Seattle, WA

The City College of New York, New York, NY

University of Maryland College Park, College Park, MD

University of Arizona, Tucson, AZ, The City College of New York, New York, NY

University of Florida, Gainesville, FL
P – Sat - A - 102
3D Tissue-engineered Model of the Neurovascular Unit for Study of Neurological Disease and Drug Treatments
1Tufts University, Medford, MA

P – Sat - A - 103
Highly Aligned Conducting Polymer Nanotubes Improves Axonal Regeneration
G. YANG, A. GREEVER, AND M. R. ABIDIAN
1Pennsylvania State University, State College, PA

P – Sat - A - 104
Co-axial Electrospun Aligned Microfibrous Scaffolds With Rosette Nanotubes for Nerve Regeneration
W. ZHU, D. FRAUCHIGER, H. FENNER, AND L. ZHANG
1The George Washington University, Washington, DC, 2University of Alberta, Edmonton, AB, Canada

P – Sat - A - 105
An Aligned Electrospun Fiber Matrix with Local Release of Paclitaxel for Spinal Cord Injury Repair
J. A. ROMAN, A. HURTADO, AND H-Q. MAD
1Johns Hopkins University, Baltimore, MD, 2Kennedy Krieger Institute, Baltimore, MD

P – Sat - A - 106
Synergistic Effects of Substrate Morphology and Shear Stress on Neuronal Differentiation of hMSCs
J. C. MARQUEZ, K-J. JEHNF, S. PARKY, Y. KANG, J-S. HUNY, M-J. OH, AND J-W. SHIN
1Department of Health Science and Technology, Inje University, Gimhae, Korea, Republic of, 2Cell & Gene Biotechnology (IGC Bi), Seongnam, Kyunggi-do, Korea, Republic of, 3Department of Biomedical Engineering, Inje University, Gimhae, Korea, Republic of, 4First Research Team/Inst. of Aged Life Redesign/Cardiovascular and Metabolic Disease Center/UHRC, Inje University, Gimhae, Korea, Republic of

Track: Tissue Engineering

Tissue Engineered Models for Study of Disease and Drug Discovery

P – Sat - A - 107
Hydroxyapatite Nanoparticles Enhance Apoptosis and Myofibroblastic Differentiation of Valvar Interstitial Cells in 3D Culture: Modulation by Endothelial Co-culture
J. RICHARDS, D. L. LIN, L. ESTROFF, AND J. BUTCHER
1Cornell University, Ithaca, NY

P – Sat - A - 108
Implanted Prevascularized Spheroids Develop Functional Vascularization that Supports Normoxic po2 Following Thrombosis
S. M. WHITE, C. PITMAN, R. AHORI, R. HINGORANI, T. ESPOUR, C. C. HUGHES, B. CHOI, AND S. C. GEORGE
1University of California, Irvine, Irvine, CA, 2The George Washington University, Washington DC, 3St. George’s University, Grenada, Grenada, 4University of Pennsylvania, Philadelphia, PA

P – Sat - A - 109
Photonic Crystal Fractal Structure for Lung Tissue – Irradiation Interaction Modeling
E. G. AZNARAYEV, A. V. VISHNEVSKY, AND D. E. AZNARAYEVA
1National Aviation University, Kiev, Ukraine

P – Sat - A - 110
In Vitro Bone Marrow Niche Model Lends Insight into SIP Receptor Signaling in the Mobilization and Homing of Hematopoietic Stem Cells
M. E. OGLE, A. AWUJODU, A. DAS, AND E. A. BOTCHWEY
1Georgia Institute of Technology, Atlanta, GA, 2University of Virginia, Charlottesville, VA

P – Sat - A - 111
Generating 3D Microtumor Beads for Anti-Cancer Drug Screening
M. E. ZIEGLER AND C. C. HUGHES
1University of California, Irvine, Irvine, CA

P – Sat - A - 112
Engineering and Evaluation of Scaffold-Hydrogel Systems to Engineer the Trabecular Meshwork In Vitro
C. N. DAUTRICH, K. TORREJON, Y. XIE, M. BERGKVIST, S. SHARFSTEIN, AND J. DANIS
1College of Nanoscale Science SUNY Albany, Albany, NY, 2Downstate Medical Center, Brooklyn, NY

P – Sat - A - 113
Collagen Coating Enhances MSC-mediated Chondrogenesis on Chitosan-Calcium Phosphate Scaffolds
A. GOTTPRAT AND S. H. ELDEH
1Mississippi State University, Starkville, MS

P – Sat - A - 114
Characterization of SPIONs Permeability by an In Vitro Blood-Brain Barrier Model
D. SHI, D. HOFF, S. NAYAR, AND T. J. WEBSTER
1Northeastern University, Boston, MA, 2Brown University, Providence, RI, 3CSIR-National Metallurgical Laboratory, Jamshedpur, India

P – Sat - A - 115
Design of a High-Throughput Report System of Follicle Health
H. ZHOU AND A. SHIKANDV
1University of Michigan, Ann Arbor, MI

P – Sat - A - 116
A Microfluidic In Vitro Liver Model for Malaria Drug Discovery
1Draper Laboratory, Tampa, 2Draper Laboratory, Tampa, FL, 3University of South Florida, Tampa, FL, 4Mahidol Vihas Research Center, Bangkok, Thailand, 5Mahidol University, Bangkok, Thailand, 6University of South Florida, Tampa

Track: Tissue Engineering

Tissue Engineering

P – Sat - A - 117
Application of Elastomeric Polymers for Bladder Regeneration
S. SIVARAMAN, J. MYERS, N. AMOROSO, W. WAGNER, AND J. NAGATOMO
1Clemson university, Clemson, SC, 2University of Pittsburgh, Pittsburgh, PA

P – Sat - A - 118
Bottom-up Strategy to Build Up Functional 3D Dermis Equivalent In Vitro by Tuning Microscaffold Degradation Rate
G. IMPARATO, F. URCIUOLI, C. CASALE, AND P. NETTI
1Center for Advanced Biomaterials for Health Care @CRIB, Istituto Italiano di Tecnologia, Naples, Italy, 2Departmental Research Center on Biomaterials-University of Naples Federico II, Naples, Italy

P – Sat - A - 119
Cytoskeletal Changes During the Differentiation of hMSCs into Osteoblasts in Early Phase
H. AN, S. PARK, Y. KANG, J-S. HYUN, M-J. OH, AND J-W. SHIN
1Department of biomedical engineering, Inje university, Gimhae, Korea, Republic of, 2First Research Team/Inst. of Aged Life Redesign/Cardiovascular and Metabolic Disease Center/UHRC, Inje university, Gimhae, Korea, Republic of

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**Track: Translational Biomedical Engineering**

**Biomaterials for Regenerative Medicine**

**P – Sat - A - 120**

Morphological Changes of Mitochondria during Endothelial Differentiation of hMSCs

S. JEEONG¹, J. SHIN², S. PARK³, Y. KANG⁴, J-S. HYUN⁴, M-J. OH⁴, and J-W. SHIN⁴, ⁵

¹Department of Health Science and Technology, Inje University, Gimhae, Korea, Republic of, ²Cardiovascular and Metabolic Disease Center, Inje University, Gimhae, Korea, Republic of, ³Department of Biomedical Engineering, Inje University, Gimhae, Korea, Republic of, ⁴First Research Team/Inst. of Aged Life Redesign/Cardiovascular and Metabolic Disease Center/ UHRC, Inje University, Gimhae, Korea, Republic of

**P – Sat - A - 121**

Decellularization of Porcine Heart Matrix with Dense-Phase Carbon Dioxide

D. M. CASAS² and M. A. MATTHEWS²

²University of South Carolina, Columbia, SC

**P – Sat - A - 122**

Bioprinting of Controlled Thickness and Microvasculization Using Biodegradable Polymers

K. SINGARAPU¹, K. SINGARAPU¹, and S. V. MADIHALY¹

¹Oklahoma State University, Stillwater, OK

**P – Sat - A - 123**

Effect of Combined Shear and Thermal Stress on Pre-osteoblasts for Bone Regeneration

A. C. SAMPSON¹ and N. RYLANDER¹

¹Virginia Tech, Blacksburg, VA

**P – Sat - A - 124**

Fabrication of Woven Tissue Engineering Scaffolds with Variable Porosity Using a Novel Bio-loom

J. GILMOR²

²Clemson University, Clemson, SC

**Track: Translational Biomedical Engineering**

**Cell-based Products for Regenerative Medicine**

**P – Sat - A - 128**

Scalable Production of Dopaminergic Neuron Progenitors for Treating Parkinson’s Disease

Y. LEE¹ and D. SCHAEFFER¹

¹University of California, Berkeley, Berkeley, CA

**P – Sat - A - 129**

Quantification of Pressure and Flow Characteristics of Intrauterine Fetal Blood Transfusion

K. MACHIRAJU¹, V. MONTAZERI², I. M. PANAH³, and K. BEBEHANI²

¹University of Texas Arlington, Arlington, TX, ²University of Texas Dallas, Richardson, TX, ³The University of Texas Arlington, Arlington, TX

**P – Sat - A - 130**

Design of a Portable Fast Scan Cyclic Voltammetry System for Measuring Neurotransmitter Levels

J. FOSTER¹, E. RAMSSON², and S. RHODES¹

¹Grand Valley State University, Grand Rapids, MI, ²Grand Valley State University, Allendale, MI

**P – Sat - A - 131**

Training System to Improve the Skills of Medical Residents Necessary to Perform Laparoscopic Surgery

W. RYYLEWSKI¹, S. RHODES¹, and J. FARRIS¹

¹Grand Valley State University, Grand Rapids, MI

**P – Sat - A - 132**

In Silico Mechanical Analysis and Feasibility Study on the InSitu-Lok – A Flexible External Tubing Connector for Extracorporeal Circuity

P. G. ALBAL¹ and P. G. MEYON²

¹Carnegie Mellon University, Pittsburgh, PA

**P – Sat - A - 133**

Automated Quantification of Morphological Deterioration of Red Blood Cells During Hypothermic Storage Using a Simple Microfluidic Device

N. Z. PIETY¹, X. YANG¹, and S. S. SHEVKOPLYAS¹

¹Tulane University, New Orleans, LA

**P – Sat - A - 134**

CANCELS BY AUTHOR

**P – Sat - A - 135**

Injectable and Self-assembling Sponge as a Protective Layer at Device-tissue Interfaces in Wound Repair

R. WANG¹, ², L. C. ARGENTA³, M. J. MORRYSWAS¹, ², and W. WAGNER¹, ²

¹Virginia Tech-Wake Forest University School of Biomedical Engineering and Sciences, Winston-Salem, NC, ²Wake Forest University School of Medicine, Winston-Salem, NC

**P – Sat - A - 136**

Intravascular Multi-Layered Glucose Sensor for An Artificial Pancreas

D. S. SABER¹, N. A. FADHLI², P. FARA², and M. FAEZIPOUR³

¹University of Bridgeport, Bridgeport, CT

**P – Sat - A - 137**

Biomaterial Evaluation in Clinically Relevant Disease Microenvironments Promotes Device Translational Capacity

N. OLIVA-JORGE², M. CANCOLE³, M. BECKERMAN⁴, ⁵, E. R. EDELMAN³, ⁵, and N. ARTZ⁴, ⁵

²MIT, Cambridge, MA, ³IQS, Barcelona, Spain, ⁴ORT Braude College, Karmiel, Israel, ⁵Brigham and Women’s Hospital, Harvard Medical School, Boston, MA
P – Sat - A - 138 
Additive Manufacture of Minimally-Invasive Medical Devices for Pancreatic Cancer Treatment
L. M. REESE1, P. GARCIA1, R. DAVALOS1, P. SHEN1, G. MISHRA1, C. WILLIAMS1, and L. R. BICKFORD1
1Virginia Tech, Blacksburg, VA, 2Wake Forest Medical Center, Winston Salem, NC

P – Sat - A - 139 
Microfluidic Device Development and Analysis to Prepare Bulk Pancreas Tissue for 3D Imaging
C. BURFELD1, R. DAS2, and E. SEIBEL1
1University of Washington, Seattle, WA

P – Sat - A - 140 
A Standardized Procedure for Generating Fibrin Clots In Vitro on Rotating Mechanical Surfaces
S. L. JESSE1, B. R. WEEKS1, and F. J. CLUDD, JR.1
1Texas A&M University, College Station, TX

P – Sat - A - 141 
AnemoCheck: a Point-of-care, Patient-operated, Standalone, Inexpensive, and Disposable Diagnostic Test for Anemia
E. A. TUBURSKI1, A. F. SIU1, and W. A. LAM1,2
1Wallace H. Coulter Department of Biomedical Engineering, Georgia Institute of Technology, Atlanta, GA, 2Alliance Cancer and Blood Disorders Center, Department of Pediatrics, Children’s Healthcare of Atlanta, Atlanta, GA

P – Sat - A - 142 
Using Hearing Aids Improves Music Perception for Cochlear Implant Users
J. CREW1, J. GALVIN III1, and Q. J. FU1
1University of Southern California, Los Angeles, CA, 2House Research Institute, Los Angeles, CA

Track: Translational Biomedical Engineering
Clinical Trials

P – Sat - A - 143 
Chronic Stability of Implanted Cuff Electrodes in Amputees
D. TAN1,2, M. SCHIEFER1,3, M. KEITH1,3, and R. ANDERSON1,2
1Case Western Reserve University, Cleveland, OH, 2Louis Stokes Department of Veterans Affairs Medical Center (LSVAMC), Cleveland, OH, 3MetroHealth, Cleveland, OH

Track: Translational Biomedical Engineering
Large Animal Studies

P – Sat - A - 144 
Ex Vivo and In Vivo Evaluation of Endothelialized Vascular Grafts after Fluid Shear Stress Stimulation
D. E. ANDERSON1, J. J. GLYN1, and M. T. HINDS1
1Oregon Health & Science University, Portland, OR

Track: Translational Biomedical Engineering
Translational Biomedical Imaging

P – Sat - A - 145 
Magnetic Resonance Imaging of Ex Vivo Oral Human Biopsies to Characterize Changes in Redox Status with Development of Oral Neoplasia
Z. LUO1, M. LOJA1, G. FARWELL1, R. GANDOUR-EDWARDS1, and N. NITIN1
1UC Davis, Davis, CA

P – Sat - A - 146 
Gastrointestinal Absorption of 99MTC-Heparin: A Radiocontrast Agent for Eosinophilic Inflammation
H. SAFFARI1, R. CONDIE1, J. J. KRSTYEN1, P. JENKINS1, K. A. PETERSON1, G. J. GLEICH1, and L. F. PEASE III1
1University of Utah, Salt Lake City, UT

P – Sat - A - 147 
Impact of Phone Choice on Mobile Phone Microscopy
A. SKANDARAJAH1,2, C. D. REBER1, N. A. SWITZ2, L. M. NILSSON1, and D. A. FLETCHER1
1University of California, Berkeley, Berkeley, CA, 2University of California, San Francisco, San Francisco, CA

P – Sat - A - 148 
Optical Clearing and Registration of Thick Pancreas Specimens: A First Step to 3D Imaging of Tissue Biology
R. DAS1, J. R. LAPOINTE1, S. SHIMER1, B. HAWTHORNE1, M. P. UPTON1, and E. J. SEIBEL1
1University of Washington, Seattle, WA, 2University of Washington Medical Center, Seattle, WA, 3Vision Gate, Inc., Seattle, WA

P – Sat - A - 149 
Cardiac Architecture Assessed In Vivo using Speckle Tracking Echocardiography
N. MAZEH1, D. HAINES1, G. RAFF1, A. ABASS2, and B. ROTH2
1Beaumont Health System, Royal Oak, MI, 2Beaumont Health System, Royal Oak, MI

Track: Translational Biomedical Engineering
Translational Therapeutics

P – Sat - A - 150 
Clinical Investigation of High Frequency Irreversible Electroporation for Skin Cancers
M. B. SANO1, C. B. ARENA1, P. A. GARCIA1, J. M. CISSELL1, J. L. ROBERTSON1, and R. V. DAVALOS1
1Virginia Tech, Blacksburg, VA, 2Virginia-Maryland Regional College of Veterinary Medicine, Blacksburg, VA

P – Sat - A - 151 
Combined Strategies to Improve Adipose-derived Stem Cells-mediated Tissue Regeneration
E. CHUNG1, S. NAM1, D. Y. SANTIESTEBAN1, L. M. RICLES1, R. S. STOWERS1, S. EMELIANOV1, and L. J. SUGGS1
1The University of Texas at Austin, Austin, TX

P – Sat - A - 152 
Platelet Storage: A Chilling Story
K. REDDICK1, P. NAIR1, R. MONTGOMERY1, C. FEDY1, H. PIDCOKE1, A. RAMASUBRAMANIAN1, and A. CAP1
1The University of Texas at San Antonio, San Antonio, TX, 2US Army Institute of Surgical Research, San Antonio, TX

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Poster Session SatA 9:30AM – 1:00PM
Poster Viewing with Authors & Refreshment Break | 9:30AM - 10:30AM

Track: Translational Biomedical Engineering

Translational Biomedical Engineering

P – Sat - A - 153
Impaired Platelet Deposition and Fibrin Accumulation in a Microfluidic Model of Hemostasis Using Whole Blood from Hemophilic Patients
T. V. COLACE1, K. A. PANCKER2, P. F. FOGARTY2, AND S. L. DIAMOND1
1University of Pennsylvania, Philadelphia, PA, 2Hospital of the University of Pennsylvania, Philadelphia, PA

P – Sat - A - 154
Dose Dependent Acute toxicity, Biodistribution, Hematological Effects, and Elimination of Dextran Functionalized Graphene Nanoplatelets
S. KANAKIA1, J. TOUSSAINT1, S. MULLICK CHOWDHURY1, T. TEMBULKAR1, S. LEE1, Y. JIANG1, R. Z. LIN1, K. SHEROYER1, W. MOORE1, and B. SITHARAMAN1
1Stony Brook University, Stony Brook, NY

Track: Bioinformatics, Computational and Systems Biology - Undergraduate Research

Bioinformatics, Computational and Systems Biology - Undergraduate Research

P – Sat - A - 155
Station: An Implicit and Graph Search Engine for Large Biomedical Term Sets
N. ROBBSON1 and H. GARNER2
1Virginia Tech School of Biomedical Engineering and Sciences, Blacksburg, VA, 2Virginia Bioinformatics Institute, Blacksburg, VA

P – Sat - A - 156
Improving Cancer Detection Performance of Quantitative Phase Microscopy through Image Registration
S. KITA1, S. UTTAN1, and Y. LUI1
1University of Pittsburgh, Pittsburgh, PA

P – Sat - A - 157
LC-MS/MS Identification of the Aquaporin-2 Interactome
D. J. HAGEMAN1, J. C. L. CHOU1, and M. KNEPPER2
1Case Western Reserve University, Cleveland, OH, 2National Institutes of Health, Bethesda, MD

P – Sat - A - 158
Quantitative Flow Cytometry Analysis of Angiogenic Growth Factor Receptors
P. K. GUPTA1, G. CONRAD2, J. PARKIN1, F. L. MONTEL1, and P. IMOUKHUEDE1
1University of Illinois Urbana-Champaign, Urbana, IL

P – Sat - A - 159
A Kinetic Model for Subcellular Distribution of Myocardin-related Transcription Factor A and Actin
B. SPAR1, Q. CHEN1, and C. NELSON1
1Princeton University, Princeton, NJ

Track: Biomaterials - Undergraduate Research

Biomaterials - Undergraduate Research

P – Sat - A - 160
Material Interaction with Touchscreens for Artificial Fingertip Research
A. B. DEINES1, E. N. MAZAR1, J. R. WISSINGER2, and B. R. CAMPBELL1
1Robert Morris University, Moon Township, PA, 2Robert Morris University, Moon Township, PA

P – Sat - A - 161
Biocompatibility of Oxime Crosslinked Hydrogels
M. R. ZANOTELLI1, G. N. GROVER2, and K. L. CHRISTMAN3
1University of Wisconsin-Madison, Madison, WI, 2University of California, San Diego, La Jolla, CA

P – Sat - A - 162
Nanoscale Physicochemical Properties of Chain- and Step-Growth Polymerized PEG Hydrogels
K. HARDING1, I. ZAMPETAKIS1, G. MARSH1, K. VAT1, R. E. WAUGH1, AND D. S. BENDIL1,2
1University of Rochester, Rochester, NY, 2University of Rochester Medical Center, Rochester, NY

P – Sat - A - 163
Characterization of the Thermal Response and Microstructure of Structurally Controlled Poly(N-Isopropylacrylamide) Hydrogels
B. J. LACETTI1, K. CHANG1, and L. TATE1
1Georgia Institute of Technology, Atlanta, GA

P – Sat - A - 164
Engineering Potato Virus X as a Platform for Targeted Cancer Therapy
P. L. CHARKO1, K. L. LEE1, and N. F. STEINMETZ2
1Case Western Reserve University, Cleveland, OH

P – Sat - A - 165
Divalent Ion Removal Improves Stability and Mechanical Properties of Gelatin Hydrogel
K. YATES1, Q. XING2, C. VOIG1, F. ZHAO1, and M. FROST1
1Michigan Technological University, Houghton, MI

P – Sat - A - 166
Examining RGD Concentration of Poly(Ethylene Glycol)-Diacylride Hydrogels for Cell Adhesion
E. J. ENGLISH1, D. A. YOUNG2, J. LARSON1, and G. PAPAWASILIOU1
1Illinois Institute of Technology, Chicago, IL

P – Sat - A - 167
Electrically Responsive Tough Hydrogels
F. Y. SU1, M. DARNIEL2, S. KENNEDY3, AND D. J. MOONEY3
1Harvey Mudd College, CA, 2California, CA, 3Harvard University, Cambridge, MA

P – Sat - A - 168
Small Molecule Eluting Nanofiber Based Bioactive Bandages for Expedited Chronic Wound Healing
E. GUADALUPE1, D. RAMOS1,2, and S. KUMBAR1,2
1University of Connecticut, Storrs, CT, 2University of Connecticut Health Center, Farmington, CT

P – Sat - A - 169
Engineering pH- and Thermos-Responsive Nanogels by Pseudo Initiator-Free Graft Polymerization
S. SRINIVASAN1, L. LIN1, R. E. MARCHANT1, AND J. ZHU1
1Case Western Reserve University, Cleveland, OH

P – Sat - A - 170
Guided Axonal Growth for Nerve Repair Using Novel Fibrous Collagen Conduit with GAG Mimetic
D. R. MATHEWS1,2, D. I. MESHOYRER1, R. D. MENEZES1, T. L. ARINZEH1, AND B. J. PFISTER1
1New Jersey Institute of Technology (NJIT), Newark, NJ, 2The College of New Jersey (TCNJ), Ewing Township, NJ

P – Sat - A - 171
In-Vitro Hemato-Compatibility of Dextran Functionalized Graphene Nanoparticles
J. M. FANG1, S. CHOWDHURY1, S. KANAKIA1, and B. SITHARAMAN1
1SUNY Stony Brook University, Stony Brook, NY

P = Poster Session
OP = Oral Presentation
P – Sat - A - 172
Effects of Detergents on the Biological Properties of Pig Liver Extract for Liver Regeneration Study
J. P. REPPER1, D. C. SULLIVAN1, and B. E. PETERSEN1
1University of Florida, Gainesville, FL

P – Sat - A - 173
Oral Delivery of siRNA Using pH-Responsive Hydrogel Nanoparticles
H. FRIZZELL1, D. FORBES1, and N. A. PEPPAS1
1University of Texas at Austin, Austin, TX

P – Sat - A - 174
Aptamer-Functionalized Hydrogel-Based Fluidic System for Dynamic Cell-Type-Specific Capture and Release
M. A. STELLON1, S. LI2, and Y. WANG3
1University of Connecticut, Storrs, CT, 2Pennsylvania State University, University Park, PA

P – Sat - A - 175
Solubility and Gelation Behavior of Keratin Biomaterials
S. M. TSUDA1, R. DE GUZMAN1, and M. VAN DYKE1
1Virginia Tech – Wake Forest, School of Biomedical Engineering and Sciences, Blacksburg, VA

P – Sat - A - 176
Development of a Model for Nanomechanical Characterization of Viscoelastic Biomaterials
L. P. KLEIN1
1Bucknell University, Lewisburg, PA

P – Sat - A - 177
Evaluation of the Immunogenic Properties and Phagocytotic Uptake of PEGylated Potato Virus X
M. WU1, K. L. LEE1, S. SHUKLA1, N. R. AVAT1, and N. F. STEINMETZ1
1Case Western Reserve University, Cleveland, OH

P – Sat - A - 178
Biocompatibility of Mg-Rare Earth Element Alloys as Biodegradable Bone Implant Materials
D. ALBERT1 and F. WIETTE2
1University of Pittsburgh, Pittsburgh, PA, 2Charité - Universitätsmedizin Berlin, Berlin, Germany

P – Sat - A - 179
Growth Factor Integration to Electrochemically Aligned Collagen Sutures for Tendon Repair
S. PANIT1, V. KISHORE1, and G. AKKUS1
1Case Western Reserve University, Cleveland, OH

P – Sat - A - 180
Fabrication and Characterization of Shape Coded Hydrogel Microparticles for Biomolecule Detection
M. AL-AMEEN1 and G. GHOSHI2
1University of Michigan, Dearborn, Dearborn, MI

P – Sat - A - 181
Improved Mechanical Properties in Hyaluronic Acid Hydrogels from Exogenous Horseradish Peroxidase
S. KAMAL1, A. ABU-HAKMÉH1, and L. Q. WANG2
1Cornell University, Ithaca, NY, 2Pennselaer Polytechnic Institute, Troy, NY

P – Sat - A - 182
Histomorphometric Analysis of Inflammation Around Stable and Failed Alginate Encapsulation Materials
V. IBARRA1, V. GUPTA1, A. APPEL1, and E. M. BRIEY1
1Illinois Institute of Technology, Chicago, IL, 2Georgia Tech, Atlanta, GA

P – Sat - A - 183
Modular Tissue Engineering: Chitosan-GAG Fibers Formed From an Ionic Complex
A. GAGLIARDI1
1Wayne State University, Hanson Township, MI

P – Sat - A - 184
Swelling and Degradation of Decellularized Cartilage and Hylauronic Acid Nanocomposite Hydrogels
B. LOHMAN1, E. BECK1, and M. DETAMORE1
1University of Kansas, Lawrence, KS

P – Sat - A - 185
Compressive Mechanical Properties of PRP-eluting Candidate Materials for a Tissue-engineered Nucleus Pulposus
C. M. LUETKEMEYER1, E. A. KALAF1, J. G. BLEDSOE1, and S. A. SELL1
1Saint Louis University, St. Louis, MO

P – Sat - A - 186
RAW264.7 Macrophage as a Model of Foreign Body Inflammatory Response to Electrospun Biomaterials
C. E. SAXON1, A. HOLIAN1, and K. L. TROUT1
1University of Montana, Missoula, MT

P – Sat - A - 187
Effects of Stretching with and without an Intermediate Dry Step on the Structural and Mechanical Properties of Fibrin Microthreads
L. M. PUMPHEY1, J. M. GRASMAN1, and G. D. PINS1
1Worcester Polytechnic Institute, Worcester, MA

P – Sat - A - 188
Quantitative Study of Bacterial Detachment from Nanopatterned Thermo-Responsive Polymer Brushes
O. PADILLA1, P. SHIYAPOUDA1, and G. LOPEZ2
1University of Puerto Rico-Cayey, Cayey, PR, Puerto Rico, 2Duke University, Durham, NC

P – Sat - A - 189
Characterization of PEO-PETA-PEDOT-PSS Conductive Hydrogel as a Metal Bioelectrode Alternative
R. E. JOHNHS JR1, G. B. KIM1, P. FAITAH1, and M. R. ABIDIAN1
1Pennsylvania State University, State College, PA

P – Sat - A - 190
Bioactive Modification of Venous Valve Biomaterial to Enable Protein C Activation
E. POLSIN1, J. GLYNN1, and M. T. HINDS2
1University of Portland, Portland, OR, 2Oregon Health & Science University, Portland, OR

P – Sat - A - 191
Additive Manufacturing of Silicate Bioactive Glass (13-93) Porous Constructs for Bone Repair
T. L. COMTE1, K. KOLAN1, M. LEU2, and P. MADRIA2
1University of North Carolina, Chapel Hill, NC, 2Missouri University of Science and Technology, Rolla, MO

Track: Undergraduate Research

Biomechanics - Undergraduate Research

P – Sat - A - 192
A Quantitative Assessment of Neuromuscular Activation of the Hip During a Single Limb Squat
R. M. YUSUFBEKOV1, K. M. CURTIS1, S. FELTON1, T. BEVINS1, and K. CSAVINA1
1Florida Gulf Coast University, Fort Myers, FL

P – Sat - A - 193
Aging Weakens Lumbar Vertebrae but Strengthens Coccygeal Vertebrae in C57Bl/6 Mice
B. A. BOMAY1, N. HOLGUIN1, and M. J. SILVA1
1Washington University, Saint Louis, MO
P – Sat - A - 194
Differing Modes of Lubrication for TMJ Condylar Cartilage and Articular Disc
B. K. ZIMMERMAN,1 D. L. BURRIS,1 AND X. L. LU1
1University of Delaware, Newark, DE

P – Sat - A - 195
Intrinsic Healing of Mouse Flexor Tendons In Vitro
M. A. WINKELMAN1 AND M. R. BUCKLEY1
1University of Rochester Department of Biomedical Engineering, Rochester, NY; University of Rochester Center for Musculoskeletal Research, Rochester, NY

P – Sat - A - 196
A Murine Model of Mechanically Induced Ca2+ Signaling in Chondrocytes In Situ
A. LEE1 AND M. BUCKLEY1
1University of Rochester, Rochester, NY

P – Sat - A - 197
Contribution of Age and Gender on Running Mechanics of the Hip at Different Running Speeds
A. HUA1, S. E. SHEEDY1, A. SEAF1, C. MONTERO1, L. BARNE1, H. VINCENT1, AND B. CONRAD1
1University of Florida, Gainesville, FL; Nike Sports Research Lab, Beaverton, OR

P – Sat - A - 198
Arterial Buckling: A New Constitutive Model-based Equation and the Effects of Elastin and Fibulin-3
C. M. LUTKEMEYER1, R. JAMES1, Z. SCHWARTZ1, S. V. DEVARAKONDA1, AND J. E. WAGENSEIL1
1Saint Louis University, Saint Louis, MO

P – Sat - A - 199
Quantifying the Effects of Anti-hypertensive Medications on the Mechanical Compliance and RNA Expression Profiles of Bioreactor Cultured Rat Carotid Arteries
S. V. DEVARAKONDA1, S. BHAVANI1, C. M. LUTKEMEYER1, J. PROCKNOW1, AND J. E. WAGENSEIL1
1Saint Louis University, Saint Louis, MO

P – Sat - A - 200
A Swimming Regimen Reduces Arterial Compliance in Elastin-deficient Mice, But Does Not Reduce Blood Pressure
W. GARDNER1, J. HOWENSTEIN1, B. SATHER1, S. BHAVANI1, L. BENNETT1, AND J. WAGENSEIL1
1Saint Louis University, St. Louis, MO

P – Sat - A - 201
Effects of Western Diet on Arterial Mechanics of ApoE-/- Mice
S. BHAVANI1, J. MAEDEKER1, W. GARDNER1, L. BENNETT1, AND J. WAGENSEIL1
1Saint Louis University, Saint Louis, MO

P – Sat - A - 202
Dynamic Fluid Loading on Turkey Trabecular Bone Marrow Morphology
Q. EN1, M. HU1, AND Y.X. QIN1
1SUNY Stony Brook, Stony Brook, NY

P – Sat - A - 203
Likelihood of Head Injury During Moderate to Severe Rear End Collisions
A. GUANG1 AND S. RUND1
1University of Illinois at Urbana-Champaign, Champaign, IL; Armstrong Forensic Engineers, Milford, MI

P – Sat - A - 204
Cell Viscoelasticity as a Function of Substrate Stiffness Quantified by Atomic Force Microscopy
R. BRUNETTI1, G. THOMAS1, AND O. WENG1
1Scripps College, Claremont, CA; Worcester Polytechnic Institute, Worcester, MA

P – Sat - A - 205
Design and Implementation of a Loading System to Assess the Ex Vivo Mechanobiology of Articular Cartilage for the Mouse Distal Femur
S. T. DAI1, J. P. CAFFREY1, F. H. HSU2, A. C. CHEN1, AND R. L. SAH1
1Union College, Schenectady, NY; 2University of California, San Diego, La Jolla, CA

P – Sat - A - 206
Shoulder Mechanics Associated with Bilateral Cane Use in Service Members with Hip Disarticulation and Transfemoral Amputation
C. B. WILKISON1, E. M. NOTTINGHAM2, A. A. LIRBERG2, N. CORTES1, AND E. J. WOLF1
1George Mason University, Fairfax, VA; 2Walter Reed National Military Medical Center, Bethesda, MD

P – Sat - A - 207
Characterization of Cartilage Mechanics and Wear After Trauma
J. G. JIMENEZ1, E. D. BONNEVILLE1, AND L. J. BONASSARI1
1Inter American University of Puerto Rico, Bayamón Campus, Mayaguez, PR; Puerto Rico, 2Cornell University, Ithaca, NY

P – Sat - A - 208
Pull-off Stress Assessment on Commercially Available Polymers Intended for Wound Treatment
R. THORNTON1, V. KHEYFETS1, AND E. FINOL1
1University of Texas at San Antonio, San Antonio, TX

P – Sat - A - 209
Rapid Manufacturing of Custom Foot Orthoses for Treatment of Diabetic Foot Ulcers and Other Foot Conditions
N. B. NUNIMBAY1, J. DESJARDINS1, B. KALUF1, N. HOOKS2, D. BALLARD3, S. HOEFFNER4, AND S. PIRIT1
1Clemson University, Clemson, SC; 2Ability Prosthetics and Orthotics, Inc., Greenville, SC; 3University of Florida, Gainesville, FL; 4Clemson Environmental Technologies Laboratory, Anderson, SC

P – Sat - A - 210
A Novel Electrode for Blast Experimentation
A. A. ALshareef1, M. REINSVOILD1, G. W. WOOD1, B. R. BIGLER1, J. K. SHRIDHARAN1, K. DZIRASA1, AND C. R. BASS2
1Duke University, Durham, NC

P – Sat - A - 211
Rapid Manufacturing of Custom Foot Orthoses for Treatment of Diabetic Foot Ulcers and Other Foot Conditions
N. B. NUNIMBAY1, J. DESJARDINS1, B. KALUF1, N. HOOKS2, D. BALLARD3, S. HOEFFNER4, AND S. PIRIT1
1Clemson University, Clemson, SC; 2Ability Prosthetics and Orthotics, Inc., Greenville, SC; 3University of Florida, Gainesville, FL; 4Clemson Environmental Technologies Laboratory, Anderson, SC

P – Sat - A - 212
Impact Force Testing on NFL Thigh Pads
N. PRAAT1, C. WILLIAMSON1, AND D. FRAMES1
1Arizona State University, Tempe, AZ

P – Sat - A - 213
Three-Dimensional Endothelial Cell Invasion and Migration are Modulated by a Collagen Gel Stiffness
S. SOMASEGAR1, B. N. MAISON1, AND C. REINHART-KING1
1Cornell University, Ithaca, NY

P = Poster Session
OP = Oral Presentation
Track: Undergraduate Research

Biomedical Engineering Education - Undergraduate Research

P – Sat - B - 1
Understanding Gold Nanoparticles Peptide Triazole mediated HIV-I Virolysis
A. NANGARLA1, A. ROSEMARY BASTIAN1, C. DUFFY1, L. BAILEY1, R. KALYAN SUNDARAM1, A. ELFMAN1, C. ANG1, and I. CHAIKEN1
1Drexel University, Philadelphia, PA

P – Sat - B - 2
Characterization of Parthenolide Delivery Using Micelles: Treatment of Leukemia Cells
L. J. BAUER1, M. P. BARANELLO1, and D. S. BENDIT1
1Department of Biomedical Engineering at University of Rochester, Rochester, NY.
2Department of Chemical Engineering at University of Rochester, Rochester, NY.
3Department of Biomedical Engineering, Center for Musculoskeletal Research at University of Rochester, Rochester, NY

P – Sat - B - 3
Coronary Stent-induced Flow Perturbations and Their Application to Instant Thrombosis
M. D. YU1, J. JIMENEZ1, and P. DAVIES1
1University of Pennsylvania, Philadelphia, PA

P – Sat - B - 4
Creation of a Wristwatch Sensor to Enhance Diabetic Footwear Adherence
R. GAPPI
1University of Arizona, Tucson, AZ

P – Sat - B - 5
Case Study on the Educational Efficacy of an Intensive Research Based Science Summer Program
S. M. ROBB1, B. R. CAMPBELL1, M. MUTUNGA1, and S. ABBOTT1
1Robert Morris University, Moon Township, PA

P – Sat - B - 6
Tunable Collagen Polymers for Improved Design and Control of Collagen-Drug Delivery Systems
R. L. NIKUL1, R. V. JOSHI1, and S. L. VOYTIK-HARBIN1,2
1Franklin College of Indiana, Franklin, IN. 2Purdue University Weldon School of Biomedical Engineering, West Lafayette, IN. 3Purdue University Department of Basic Medical Sciences, West Lafayette, IN

P – Sat - B - 7
Design and Development of a Stream Steerable Microfluidic Device
A. HOUSTON1
1Vanderbilt, Nashville, TN

Track: Undergraduate Research

Biomedical Imaging and Optics - Undergraduate Research

P – Sat - B - 8
Modeling Countertransport: To Equilibrate or Not To Equilibrate
Y. ABDULLAH1
1Seattle Central Community College/University of Washington, Seattle, WA

P – Sat - B - 9
Observation of Diffusion of Liposomal Drug Carriers in Collagen
S. THANIKACHALAM1, G. ORSINGER1, S. LEUNG1, and M. ROMANOWSKI1
1University of Arizona, Tucson, AZ

P – Sat - B - 10
High Resolution, Depth-Resolved Imaging of Mouse Heart Microvasculature using Optical Histology
P. LO1, A. MOY1, and B. CHO1
1Beckman Laser Institute and Medical Clinic, Irvine, CA. 2University of California, Irvine, Irvine

P – Sat - B - 11
Finding Medial Points Using Homogeneity Ascent Graphs in High-Frequency Ultrasound
C. WONG1, V. SHIVAPRABHU1, S. HORVATH1, J. GALEOTTI1, J. WANG1, A. ZHANG1, V. GORANI1, and G. STETTEN1
1University of Pittsburgh, Pittsburgh, PA. 2Carnegie Mellon University, Pittsburgh, PA

P – Sat - B - 12
How Biofilm Inhibitors Affect Biofilm Structure
M. KIAMCO1, M. KHAJ1, H. BEYENAU1, N. ABU-LAIL1, and D. CALL1
1Washington State University, Pullman, WA

P – Sat - B - 13
Manual Realignment of Short Axis 2DE Images Provides Stable Reference Point for Wall Motion Analysis
A. P. CLARK1, K. M. PARKER1, and J. W. HOLMES1
1University of Virginia, Charlottesville, VA

P – Sat - B - 14
Towards Monitoring Bone Graft Healing with Diffuse Correlation Spectroscopy
H. KIM1, K. JUNG1, M. D. HOFFMAN1, D. S. BENDIT1, and R. CHOE1
1University of Rochester, Rochester, NY

P – Sat - B - 15
Functional Imaging of Vigilance Decrement By Characterizing Brain Tissue Pulsatility Using Ultrasound
V. F. BÖTEYECHEIR1, R. G. RAMIREZ1, T. H. SHAW1, and S. SIKDAR1
1George Mason University, Fairfax, VA

P – Sat - B - 16
Simulation of Refraction Artifacts in Shear Wave Velocity Estimation with Curvilinear Transducers
V. SAYSEG1, J. LANGDON1, and S. MCALEVEY1
1University of Rochester, Rochester, NY

P – Sat - B - 17
Monitoring Cardiac Development in Drosophila Melanogaster using Optical Coherence Microscopy
N. M. PIROZZI1, A. ALEX1, A. LIP1, R. E. TAN21, and C. ZHOU1
1Lehigh University, Bethlehem, PA. 2Massachusetts General Hospital and Harvard Medical School, Boston, MA

P – Sat - B - 18
Comparison of X-Ray Phase Contrast and Histology for Evaluation of Islets Encapsulated in Alginate Microbeads
V. GUPTA1, A. A. APPEL1, J. C. LARSON1, M. A. ANASTASIO1, and E. M. BHEY1
1Georgia Institute of Technology, Atlanta, GA. 2Illinois Institute of Technology, Chicago, IL.
3Edward Hines Jr. VA Hospital, Hines, IL. 4Washington University in St. Louis, St. Louis, MT

P – Sat - B - 19
Oblique Illumination Interferometric Reflectance Imaging Sensor for Small Molecule Detection
A. GOKOGLU1, A. P. REDDINGTON1, and M. S. UNILO1
1Boston University, Boston, MA

P – Sat - B - 20
AFM Adhesion Analysis of Pseudomonas fluorescens
M. E. SCHWARTZ1, I. IVANOV1, C. D. BOYD2, G. A. O’TOOLE2, and T. A. CAMESANO1
1Worcester Polytechnic Institute, Worcester, MA. 2Stanford, Stanford, CA. 3Dartmouth College, Dartmouth, NH
Track: Undergraduate Research

Cancer Technologies - Undergraduate Research

P – Sat - B - 21
Creation of a Handheld NIRS Imaging Device for Infants
D. C. PELKEY*
*University of Pittsburgh, Richmond, VA

P – Sat - B - 22
Patient Motion Tracking for Medical Imaging Using 3D Sensing
N-C. H. LY*, J. T. EAGLE*, J. MEYER*, AND A. M. ALESSIO*
*University of Washington, Seattle, WA, 1University of Canterbury, New Zealand

P – Sat - B - 23
Initial Evaluation of Novel Dimeric-cRGD Peptide for Multimodal Imaging of Angiogenesis
1University of Illinois at Urbana-Champaign, Urbana, IL, 2Beckman Institute, Urbana, IL

P – Sat - B - 24
Calculating Field Expansion and Apical Scotoma Size in Optical Correction for Homonymous Hemianopia
M. DUPUIS*, J. H. JUNG*, AND E. PELI*
1University of Rochester, Rochester, NY, 2Scheepens Eye Research Institute, Massachusetts Eye and Ear.

P – Sat - B - 25
Correlation Between Individual, ICA Generated, Resting State fMRI Networks Predicts Variability in Reaction Time on PVT
1Georgia Tech, Atlanta, GA, 2Georgia Tech and Emory University, Atlanta, GA

P – Sat - B - 26
Micro-PIV of Bubble Splitting in a Bifurcation
S. L. Stephenson1, I. Hellmeier2, J. J. Pitré1, D. S. Li1, and J. L. Bull1
1University of Michigan, Ann Arbor, MI

P – Sat - B - 27
Altering the Tetramerization Domain of p53 for use in Cancer Gene Therapy
T. C. WALLACE*, A. OKAL*, AND C. S. LIM*
1University of Utah, Salt Lake City, UT

P – Sat - B - 28
Subcellular Localization of HER2 Receptor Signaling Pathway Proteins Using Quantum Dot-Compatible Fluorescent Markers
R. LUCERD*, T. JACOBY, W. LAM*, AND T. VULI
1University of Washington, Seattle, WA, 2Oregon Health and Sciences University, Portland, OR

P – Sat - B - 29
Collagen Fibrillar Structure and its Role in the Pro-angiogenic Capability of Stromal Cells
A. N. KODIBERDI1, B. SETO1, J. GONZALEZ2, AND C. FISCHBACH1
1Cornell University, Ithaca, NY

P – Sat - B - 30
Engineering Lipid-Polymer Hybrid Nucleic Acid Delivery Vehicles for Gene Therapy
K. M. KARRIBI1, M. T. BURGESS2, T. TA1, AND T. M. PORTER1
1Boston University, Boston, MA

Cardiovascular Engineering - Undergraduate Research

P – Sat - B - 31
Development of a Screening Assay to Identify Inhibitors of the ROR2 Receptor
A. A. VALIGA*, M. P. O’CONNELL1, D. SCHULTZ*, K. MARCHBANK1, M. WEBSTER1, A. KAUR1, AND A. T. WEERARATNA1
1The Wistar Institute, Philadelphia, PA

P – Sat - B - 32
The Use of Electrokineetic Phenomena to Characterize Malignant Cells
P. KYLE1, L. ANDERS1, J. CEMAZAR1, C. ROBERTS2, E. SCHMIEL2, AND R. DAVALOS1
1Virginia Tech, Blacksburg, VA

P – Sat - B - 33
The Effect of Primary Cilia on Non-Small Cell Lung Cancer
K. M. MOBARAKEH1, M. RADIKA1, E. XU1, AND R. L. HEISE1
1Virginia Commonwealth University, Richmond, VA

P – Sat - B - 34
Development of a Deterministic Antibody Array Display Technology using a Plant-Virus-based Molecular Scaffold
K. CHEN1, M. GLIDDEN1, M. McBURNEY1, D. A. THOMPSON2, P. DAVISON2, AND N. P. STEINMETZ1
1Case Western Reserve University, Cleveland, OH, 2The Scripps Research Institute, La Jolla, CA, 3Case Western Reserve University, Cleveland, CA

P – Sat - B - 35
The Effect of miRNA Secondary Structure and Drosha Expression on miRNA Biosynthesis
R. D. JONES*, H. SPERBER1, A. BEEM1, A. KUKREJA1, AND H. RUDOLA-BAKER1
1University of Washington, Seattle, WA, 2Carnegie Mellon University, Pittsburgh, PA

P – Sat - B - 36
Simulating Delivery, Binding, and Clearance of a Novel Hypoxygenating Contrast Agent
J. M. MARTIN1, P. K. GULAKA2, AND V. D. KOBRAGAR1,2
1Arizona State University, Tempe, AZ, 2University of Texas Southwestern Medical Center, Dallas, TX

Track: Undergraduate Research
P – Sat - B - 41
Fibrin Deposition: a Reductionist Model for Clot Formation on Streamlined vs. Non-streamlined Stents
C. KAMPMEYER1, J. M. JIMÉNEZ2, and P. F. DAVIES1
1University of Pennsylvania, Philadelphia, PA

P – Sat - B - 42
Calcific Aortic Valve Disease Cell Culture: Three Dimensional Methods for Cellular Characterization of Calcified Valves
H. FARES1, M. SAPP2, and K. GRANDE-ALLEN1
1Rice, Houston, TX

P – Sat - B - 43
Drying of Collagen Gels to Increase Stiffness and Strength
D. J. SHAVER1, J. RAYKIN2, and R. GLEASON3
1Georgia Institute of Technology, Sharpsburg, GA, 2Georgia Institute of Technology, Marietta, GA, 3Georgia Institute of Technology, Atlanta, GA

Track: Undergraduate Research

Cellular and Molecular Bioengineering - Undergraduate Research

P – Sat - B - 44
Quantitative Analysis of Thin Filament Length During Postnatal Skeletal Muscle Development in Mice
E. A. Dubuc1, V. M. Fowler2, and D. S. Gokhin2
1WESFERN NEW ENGLAND UNIVERSITY, SPRINGFIELD, MA, 2THE SIRIPS RESEARCH INSTITUTE, LA JOLLA, CA

P – Sat - B - 45
Sex and Seasonal Differences in Immunocompetence in the Malaysian Fruit Bat (Pteropus vampyrus).
M. H. SCHWARTZ1, M. E. VOIDZAK2, K. A. FIELD2, and D. M. REEDER3
1Bucknell University, Lewisburg, PA

P – Sat - B - 46
In Vitro Analysis of Reamer-Irrigator-Aspirator Wastewater as an Osteogenic Supplement
D. C. CROWDER1, J. D. KLAUS2, J. JUNKO3, E. MILLER1, and F. SAFADI4
1The University of Akron, Akron, OH, 2Northeast Ohio Medical University, Rootstown, OH, 3Summa Health Systems, Akron, OH, 4Kent State University, Kent, OH

P – Sat - B - 47
Validation of Detection Antibodies for a Microfluidic Platform to Measure Multiple Intracellular Proteins in Single Cells
I. A. ABDURANT1, E. SULISTIJO1, Y. WU2, R. FAN3, and K. MILLER-JENSEN4
1University of Maryland Baltimore County, Baltimore, MD, 2Yale University, New Haven, CT

P – Sat - B - 48
A Novel Peptide That Preferentially Binds Tumor-Associated Macrophages in Solid Tumors
J. YU1, M. CIESLIEWIC2, and S. PUN3
1University of Washington, Seattle, WA

P – Sat - B - 49
Automating the Transformation of Tobacco Mosaic Virus to Spherical Viruses for Biomedical Applications
A. L. VANMEETER1, M. A. BRUCKMAN2, and N. F. STEINMETZ3
1Case Western Reserve University, Cleveland, OH, 2Case Western Reserve University School of Medicine, Cleveland

P – Sat - B - 50
Transfection Optimization for Precise Control of Insulin Expression
L. CRUZ1
1University of California, San Diego, Ontario, CA

P – Sat - B - 51
High-throughput Quantitative Assays to Characterize Protein Interaction Systems
S. KISHTA1, R. McNALLY1, and T. KINZER-URSEM1
1Purdue University, West Lafayette, IN

P – Sat - B - 52
In Vitro Suppression of Fibroblast Density by Lubricin Coating
Z. YANG1, G. ANINIWENE1,2, and T. WEBSTER3
1Brown University, Providence, RI, 2Northeastern University, Boston, MA

P – Sat - B - 53
Engineering a Cellular Model with Inducible Expression of Fluorescent Hemoglobins to Optimize Sickle Cell Gene Therapy Strategies
D. W. CLOUGH1 and M. O. PLATT1
1Georgia Institute of Technology, Atlanta, GA

Track: Undergraduate Research

Device Technologies and Biomedical Robotics - Undergraduate Research

P – Sat - B - 54
Computational Modeling and Force Simulation of Shoulder Pads
C. D. WORKMAN1, C. CIUJAN1, L. H. SNYDER1, A. QUACH1, and D. H. FRAKES1
1Arizona State University, Tempe, AZ

P – Sat - B - 55
Applying Microfluidic Technology to Zebrafish Handling and Orientation
C. R. BULOW1, D. SCHAFER2, R. REISER1, Q. GUAN1, J. GAMS1, and K. SEAL1
1Yanderbilt University, Nashville, TN

P – Sat - B - 56
Model-Based Conformance Testing for Implantable Pacemakers
G. M. CHEY1, Z. JIANG2, and R. MANGHARAM3
1Johns Hopkins University, Baltimore, MD, 2University of Pennsylvania, Philadelphia, PA

Track: Undergraduate Research

Drug Delivery - Undergraduate Research

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Delayed Drug Release by Chitosan-Alginate Beads
D. ZHANG1, L. ACTIS1, and J. L. ONG2
1University of Texas at San Antonio, San Antonio, TX

P – Sat - B - 58
Effects of Chitosan Modifications on Protein Release
S. KUMAN1, B. KOIPOL2, C. W. WALLACE1, and D. ZAHAROFF1
1University of Arkansas, Fayetteville, AR

P – Sat - B - 59
Release of Amphotericin B From Cyclodextrin Polymer Delivery System
C. A. GORMLEY1, S. ZUCKERMAN2, J. KORLEY1, and H. VON RECOM3
1Case Western Reserve University, Cleveland, OH

P – Sat - B - 60
The Impact of PEG-DA Molecular Weight on the Release Characteristics and Gel-Sol Transition Temperature of Thermoresponsive Hydrogels
K. AMARAL4,5, E. DOSMAR1, and J. J. KANG-MEIL1
4Illinois Institute of Technology, Chicago, IL, 5Western New England University, Springfield, MA

P – Sat - B - 61
Medufuse: Mobile Medical Injections
A. BUKHTA1, B. HIRD1, and J. LEE1
1Harvard University, Brooklyn, NY, 2Harvard University, Cambridge, MA
### Track: Undergraduate Research

#### Nano to Micro Technologies - Undergraduate Research

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<td>Y. YUAN&lt;sup&gt;1&lt;/sup&gt; and D. SARKAR&lt;sup&gt;1&lt;/sup&gt;</td>
<td>University at Buffalo, SUNY, Buffalo, NY</td>
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<td>Nano-architectural Multilayers of Polyelectrolytes and Immunoglobulin for Encapsulation (QCM study)</td>
<td>K. DILAI&lt;sup&gt;1,2&lt;/sup&gt;, G. PAREKH&lt;sup&gt;1&lt;/sup&gt;, and Y. M. LVOV&lt;sup&gt;2&lt;/sup&gt;</td>
<td>Clarkson University, Potsdam, NY; Louisiana Tech University, Ruston, LA</td>
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<td>K. SHAHI&lt;sup&gt;1&lt;/sup&gt;, B. ROHRMAN&lt;sup&gt;1&lt;/sup&gt;, and R. RICHARDS-KORTUM&lt;sup&gt;1&lt;/sup&gt;</td>
<td>Rice University, Houston, TX</td>
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<td>Fabrication of a 3D Microflow Cytometer</td>
<td>A. J. DV&lt;sup&gt;1&lt;/sup&gt;, R. A. ERICKSON&lt;sup&gt;2&lt;/sup&gt;, and R. JIMENEZ&lt;sup&gt;2&lt;/sup&gt;</td>
<td>Indiana University, Bloomington, IN; University of Colorado, Boulder, CO</td>
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<td>J. S. HOUGHTALING&lt;sup&gt;1&lt;/sup&gt; and E. FU&lt;sup&gt;1&lt;/sup&gt;</td>
<td>University of Washington, Seattle, WA</td>
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<td>P. M. MASCHKHOFF&lt;sup&gt;1&lt;/sup&gt;, B. M. GEILICH&lt;sup&gt;1&lt;/sup&gt;, and T. J. WEBSTER&lt;sup&gt;1&lt;/sup&gt;</td>
<td>Northeastern University, Boston, MA</td>
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<td>T. TANNER&lt;sup&gt;1&lt;/sup&gt; and A. OSTAFIN&lt;sup&gt;1&lt;/sup&gt;</td>
<td>University of Utah, Salt Lake City, UT</td>
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<td>A. LAI&lt;sup&gt;1&lt;/sup&gt;, C. ELLENSON&lt;sup&gt;1&lt;/sup&gt;, J. LIMNES&lt;sup&gt;1&lt;/sup&gt;, and C. KLAPPERICH&lt;sup&gt;1&lt;/sup&gt;</td>
<td>Boston University, Boston, MA</td>
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<td>A. PUN&lt;sup&gt;1&lt;/sup&gt;, Y. ZU&lt;sup&gt;1&lt;/sup&gt;, Y. LU&lt;sup&gt;2&lt;/sup&gt;, S. HUANG&lt;sup&gt;2&lt;/sup&gt;, and S. WANG&lt;sup&gt;2&lt;/sup&gt;</td>
<td>Duke University, Durham, NC; Louisiana Tech University, Ruston, LA</td>
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<td>A. HERUR-RAMAN&lt;sup&gt;1&lt;/sup&gt;, P. B. LANDON&lt;sup&gt;2&lt;/sup&gt;, and R. LAL&lt;sup&gt;2&lt;/sup&gt;</td>
<td>Northwestern University, Chicago, IL; University of California, San Diego, La Jolla, CA</td>
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<td>Case Western Reserve University, Cleveland, OH; The University of Western Ontario, London, ON, Canada</td>
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<td>C. MACIAS&lt;sup&gt;1,2&lt;/sup&gt;, Y-A. LIN&lt;sup&gt;2&lt;/sup&gt;, and H. CUI&lt;sup&gt;2&lt;/sup&gt;</td>
<td>University of Texas at San Antonio, San Antonio, TX; Johns Hopkins University, Baltimore, MD</td>
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<td>A. C. BLEEM&lt;sup&gt;1&lt;/sup&gt; and W. E. THOMAS&lt;sup&gt;2&lt;/sup&gt;</td>
<td>Montana State University, Bozeman, MT; University of Washington, Seattle, WA</td>
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<td>G. SINGLETON&lt;sup&gt;1&lt;/sup&gt;, B. GEILICH&lt;sup&gt;1&lt;/sup&gt;, and T. WEBSTER&lt;sup&gt;1&lt;/sup&gt;</td>
<td>Northeastern University, Boston, MA</td>
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<td>J. M. NEWTON&lt;sup&gt;1&lt;/sup&gt;, D. W. RITTER&lt;sup&gt;1&lt;/sup&gt;, and M. J. MCMANUS&lt;sup&gt;1&lt;/sup&gt;</td>
<td>Texas A&amp;M University, College Station, TX</td>
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<td>W. WU&lt;sup&gt;1&lt;/sup&gt;, P. KULIK&lt;sup&gt;1&lt;/sup&gt;, S. SCHMIDT&lt;sup&gt;1&lt;/sup&gt;, J. FLICEK&lt;sup&gt;1&lt;/sup&gt;, L. CHRISTENBURG&lt;sup&gt;1&lt;/sup&gt;, and D. M. RATNER&lt;sup&gt;1&lt;/sup&gt;</td>
<td>University of Washington, Seattle, WA; University of British Columbia, Vancouver, BC, Canada</td>
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<td>S. R. COLE&lt;sup&gt;1&lt;/sup&gt;, D. DEAN&lt;sup&gt;1&lt;/sup&gt;, and C. KITCHENS&lt;sup&gt;1&lt;/sup&gt;</td>
<td>Clemson University, Clemson, SC</td>
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#### Track: Undergraduate Research

#### Neural Engineering - Undergraduate Research

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<td>University of Pittsburgh, Pittsburgh, PA; University of Pittsburgh School of Medicine, Pittsburgh, PA; McGowan Institute for Regenerative Medicine, Pittsburgh, PA</td>
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<td>Boston University, Boston, MA</td>
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<td>L. A. HYLTON&lt;sup&gt;1&lt;/sup&gt;, T. SANDERS&lt;sup&gt;1&lt;/sup&gt;, and M. CLEMENS&lt;sup&gt;1&lt;/sup&gt;</td>
<td>Georgia Institute of Technology, Falls Church, VA; Georgia Institute of Technology, Atlanta, GA</td>
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D. CHARLES1, D. KAMPER1,2, K. QIAN1,2, and I. OCHIR1
1Illinois Institute of Technology, Chicago, IL, 2Northwestern University, Chicago, IL,
3University of Chicago, Chicago, IL

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D. RUBENSTEIN1, P. GAMBLE1, K. TRIPLET1, M. STEPHEN1, W. Z. RAY1, and M. R. MACEWAN1
1George Washington University, Washington, DC, 2Washington University School of Medicine, Saint Louis, MO

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PEDOT/GO Carbon Fiber Microelectrodes for Dopamine Detection
L. ZHANG1,2, C. WEAVER1,2, and T. CUI1
1University of Pittsburgh, Pittsburgh, PA, 2Tissue/Electrode Interface & Neural Tissue Engineering Lab, Pittsburgh, PA

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A. SADRAEI1 and A. JAIN1
1Worcester Polytechnic Institute, Worcester, MA

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S. M. KNOWLTON1, K. E. DRZEWIECKI1, and D. I. SHREIBER1
1University of Connecticut, Storrs, CT, 2Rutgers, The State University of New Jersey, Piscataway, NJ

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P. IYER1, H. VALLABHANENI1, A. SENGUPTA1, R. E. KOHMAN1, and X. HAN1
1Boston University, Boston, MA

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R. DE LA ROSA1, K. BALASUBRAMANIAM2, M. VANDY1,2, and N. HATSPINEOULOS2
1Brown University, Providence, RI, 2University of Chicago, Chicago, IL

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K. DAY1,2, V. CAGGINO1,2, V. C. CHEUNG1,2, and E. BIZZI1,2
1University of Pittsburgh, Pittsburgh, PA, 2Massachusetts Institute of Technology, Cambridge, MA, 3McGovern Institute for Brain Research, Cambridge, MA

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S. SUN1, M. RAVIKUMAR1, and J. CAPADONA1
1Case Western Reserve University, Cleveland, OH

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W. TOMASZEWSKI1, M. RAVIKUMAR1, S. SUN1, and J. CAPADONA1
1Case Western Reserve University, Cleveland, OH

Track: Undergraduate Research
New Frontiers and Special Topics - Undergraduate Research

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J. W. LAU1,2, S. B. HALL1, C. TORRES3, J. C. BARRIOZO4, M. KATO-MAEDA2, A. CATAMANDU5, D. A. FLETCHER4, and B. R. BAKER4
1Clemson University, Clemson, SC, 2Lawrence Livermore National Laboratory, Livermore, CA, 3University of California, San Francisco, San Francisco, CA, 4University of California, Berkeley, Berkeley, CA

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N. REJAL1, J. L. MONTGOMERY1, and C. T. WITTWER1
1University of Utah, Salt Lake City, UT

Track: Undergraduate Research
Orthopaedic and Rehabilitation Engineering - Undergraduate Research

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J. W. LLEWELLYN1,2, J. L. MONTGOMERY1, S. B. REEDER1,2, and J. A. ANDOUH1
1New Jersey Institute of Technology (NJIT), Newark, NJ, 2Harding University, Searcy, AR, 3Washington University School of Medicine, Saint Louis, MO

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E. APGAR1,2, I. J. DUPREE1,2, L. F. MORALES1,2, K. K. CARUNAKARAN1, K. M. ABBRUZZESE1, and R. A. FOULDS1
1New Jersey Institute of Technology (NJIT), Newark, NJ, 2Harding University, Searcy, AR, 3University of Illinois, Urbana-Champaign, IL, 4Middlesex County College, Edison, NJ

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K. C. WALLACE1,2, E. R. HARLOW1,2, O. S. MANUKIAN3,4, A. MASOUDI1,4, M. WEXLER1,2, N. PATEL1,2, B. HERTZ1,2, A. J. RAMAPPA1, J. P. DEANGELIS1, and A. NAZARIAN1
1Department of Orthopaedic Surgery, Beth Israel Deaconess Medical Center, Harvard Medical School, Boston, MA, 2Department of Biomedical Engineering, Boston University, Boston, MA, 3Department of Biomedical Engineering, University of Connecticut, Storrs, CT, 4Harvard Medical School, Boston, MA

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E. R. HARLOW1,2, K. C. WALLACE1,2, O. S. MANUKIAN3,4, B. S. BEAMER1, A. MASOUDI1,4, N. PATEL1,2, J. J. OLSONG1, B. HERTZ1,2, A. NAZARIAN1, and A. J. RAMAPPA1
1Department of Orthopaedic Surgery, Beth Israel Deaconess Medical Center, Harvard Medical School, Boston, MA, 2Department of Biomedical Engineering, Boston University, Boston, MA, 3Department of Biomedical Engineering, University of Connecticut, Storrs, CT, 4Harvard Medical School, Boston, MA, 5Case Western Reserve University School of Medicine, Cleveland, OH

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Effect of X-Ray Dose on Porcine Articular Cartilage
J. WILLIAMS1, J. WILSON1, K. NUGENT1, and D. DIZA1
1Clemson University, Clemson, SC, 2SC Governor’s School for Science and Math, Hartsville, SC

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J. FREIDRICKS1,2, E. HIPPELESTEEL1, and M. DRESSLER2
1University of Toledo, Toledo, OH, 2DePuy Synthes Joint Reconstruction, Warsaw, IN
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K. L. Yang1, D. T. Bridgen1, D. A. Alcorta1, L. Jing1, R. E. Isaacs1, C. A. Bagley1, J. Chen1, and L. A. Setton1
1Duke University, Durham, NC

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B. R. Storck1, B. Schryver2, G. Osgood3, N. Chakraborty4, M. Thompson5, and M. A. Menke6
1Eastern Illinois University, Charleston, IL, 2BioCision, LLC, Larkspur, CA, 3University of Michigan - Dearborn, Dearborn, MI

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S. N. Thede1, N. Bajaj2, C. Whittington1, A. Rundell1, and S. Voytk-Harin1
1Purdue University, West Lafayette, IN, 2Purdue University, West Lafayette, IN

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A. Chen1, M. D. Hoffman2, C. S. Chen3, D. S. Reynolds4, and D. S. Begg1,2
1University of Rochester, Rochester, NY; 2Center for Musculoskeletal Research, Rochester, NY

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G. Samandi1, M. Detamore1, C. Berkland2, J. Haslam2, and V. Gupta2
1University of Kansas, Lawrence, KS

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E. A. Trevino1, L. M. Ricles2, and L. J. Suggs3
1The University of Texas, Austin, TX

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K. L. Kalinowski1 and S. P. Zustin1
1Saint Louis University, Saint Louis, MO

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Z. L. Paulson1, T. Kasputis2, C. N. Sargus2, and A. K. Pannier2
1Texas A&M University, College Station, TX, 2University of Nebraska - Lincoln, Lincoln, NE

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B. A. Minden-Brikkenmaier1, J. T. Lasaster1, B. E. Janowiajk1, and S. A. Sell1
1Saint Louis University, St. Louis, MO, 2Saint Louis University, St. Louis, MO

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C. Gutiérrez1, V. Triacca1, M. Pisano1, and M. A. Swartz2
1Drexel University, Philadelphia, PA, 2Ecole Polytechnique Federale de Lausanne, Lausanne, Switzerland

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M. B. Elliott1, E. Antoniadou2, and H. Kong2
1Saint Louis University, St. Louis, MO, 2University of Illinois at Urbana-Champaign, Champaign, IL

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A. N. Rindone1, A. R. Vannasse2, J. M. Forte2, and R. L. Page2
1Rensselaer Polytechnic Institute, Troy, NY; 2Worcester Polytechnic Institute, Worcester, MA

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J. Higate1 and D. Shrieve1
1Rutgers University, Piscataway, NJ

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M. Parulekar1, B. Akar1, E. M. Brey1, and S. Somov1
1Illinois Institute of Technology, Chicago, IL

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J. A. Rios1, M. K. Vaiik1, and E. M. Brey1
1Illinois Institute of Technology, Chicago, IL

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C. Bautista1, A. Mehl2,3, M. Kelley2,3, R. Stefan3,2, and B. Bilgen3,2
1Brown University, Providence, RI, 2Providence VA Medical Center, Providence, RI, 3Alpert Medical School of Brown University and Rhode Island Hospital, Providence, RI

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A. Swell1, L. L. Cooper1, and M. W. Rolle1
1Worcester Polytechnic Institute, Worcester, MA

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1University of Arizona, Tucson, AZ; 2University of California San Diego, San Diego, CA

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Nanofibrous Silk Fibroin Membranes for Orthopedic Applications
Z. Karahalioolu1, B. Erkan2, E. B. Denkba3, and T. J. Webster2
1Hacettepe University, Boston, MA, 2Northeastern University, Boston, MA, 3Hacettepe University, Ankara, Turkey

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Modeling Flow Characteristics Within a Perfusion Bioreactor Using Computational Fluid Dynamics
M. J. Robeson1, J. Gandhi1, E. Berson1, and E. M. Brey2
1University of Louisville, Louisville, KY; 2Illinois Institute of Technology, Chicago, IL

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Synthesis of Hydrogels for 3-D Cell Culture via Copper Free Click Chemistry
K. Beaven1, R. Navarro2, and T. Betancourt1
1University of Kentucky, Lexington, KY; 2Texas State University, San Marcos, TX

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Pittsburgh Tissue Engineering Summer Camps: Seeding Young Minds with TE
H. M. Smith1 and A. P. Maye1
1University of Pittsburgh, Glenshaw, PA, 2University of Pittsburgh, Los Angeles, CA
Track: Undergraduate Research

Translational Biomedical Engineering - Undergraduate Research

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On-Chip Detection of HIV Using Loop-Mediated Isothermal Amplification
A. NANDYALA1, E. SALM1, C. DUARTE1, G. DAMHORST1, and R. BASHIR2, 3
1University of Illinois at Urbana-Champaign, Urbana, IL; 2University of Illinois at Urbana-Champaign, Champaign, IL

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Designing Neonatal Monitoring Devices for Resource-Poor Settings
A. DEVON1, K. GAINELY2, H. ADAMS1, J. DESJARDINS1, and D. DEAN1
1Clemson University, Clemson, SC

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Mechanical, Low-cost, and Accurate IV Volume Regulator for Developing Countries
E. SKIRRETT1, K. SHAH1, M. NOJODI1, M. PAN1, B. FLYNN1, T. WALKER1, M. ODEN1, and R. RICHARDS-KORTUM1
1Rice University, Houston, TX

Track: Undergraduate Research

Undergraduate Research

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Three-Dimensional Printed Sucrose Preforms for Aqueous-Polymer Scaffold Fabrication
S. WONG/VIBULSIN1, S. REED1, and B. WU1
1University of California, Los Angeles, Los Angeles, CA

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Exploring the Middle Ear Function in the Parakeet
Y. LEE1, E. S. OLSON1, and W. DONG1
1Columbia University, New York, NY

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T. MON1, J. SAFFIE1, W. WONG1, C. KLAPPRECHT1, and A. SAUER-BUDGE1, 2
1Boston University, Boston, MA; 2Fraunhofer CMI, Boston, MA

P – Sat - B - 148
Hsp90 Inhibitor Ganetespib Radiosensitizes Liver Cancer Cells
A. ANNADANAN1, S. THIRUGANASAMBANDAM1, N. GANDHI1, A. WILD1, J. HERMAN1, and P. T. TRAN1
1Johns Hopkins University, Baltimore, MD

P – Sat - B - 149
A Microwell Array for Culturing Hepatocytes
M. E. WECHSLER1, E. I. QENDRO1, M. AKIBARI1, and A. KHADENHOSEINI1
1Harvard-MIT Division of Health Sciences and Technology, Cambridge, MA

P – Sat - B - 150
Automated Behavioral Interface for Optogenetic Manipulation
M. P. ELAM1, X. HAN1, M. BUCKLIN1, Z. ZHOU1, and T. GUNNELS1
1Boston University, Boston, MA

P – Sat - B - 151
Automated Quantification of Cardiac Fibrosis in the mRen2(27) Transgenic Rat
C. E. RAYBILL1, J. HANEY1, and S. G. SHROFF1
1University of Pittsburgh, Pittsburgh, PA
P – Sat - B - 164
Characterization of a Human Kidney Cell Line for Physiologically
Realistic In Vitro Models
M. Reiss1, C. Sakolish1, and G. Mahler1
1Binghamton University, Vestal, NY

P – Sat - B - 165
The Effect of Surface Variation on the Risk of Head Injury on a Playground
G. P. Danchik1, C. D. DiDomencic1, and E. A. Kennedy1
1Bucknell University, Lewisburg, PA

P – Sat - B - 166
Relation of Hemorrhoidal Parameters and ADMA in Ethnic Groups of
African Descent
C. J. Deanes1, R. S. Madhurapuntala1, K. Gerald1, A. Singh1, and P. Dhar1
1Illinois Institute of Technology, Chicago, IL

P – Sat - B - 167
The Effect of Inflammation on Muscle Sensory Function in Adult Mice
A. B. Allawala1 and K. Wilkinson1
1San Jose State University, San Jose, CA

P – Sat - B - 168
Nanochain Particles Prevent Metastatic Growth Using Radiofrequency-
Triggered Release of Chemotherapy
S. T. Tucci1, P. Pieris1, M. Tam1, A. Abramowski1, R. Toy1, P. Vicente1, L. Bauer1,
A. Mayer1, J. Panasky1, E. Doollittle1, E. Schmidt1, R. Gopalakrishnan1, R. Keri1,
J. Basilion1, M. Griswold1, and E. Karathanasis1
1Case Western Reserve University, Cleveland, OH

P – Sat - B - 169
Correlation of Micro-indentation to Other Factors Indicative of
Bone Quality
A. Dincer1, S. Denning1, R. Pisano1, E. A. Kennedy1, and D. M. Ebenstein1
1Bucknell University, Lewisburg, PA

P – Sat - B - 170
Computational Modeling and Prediction of G-quadruplex Formation
J. S. Calvert1, A. Kreig1, S. Sinha1, and S. Myong1
1University of Illinois at Urbana-Champaign, Champaign, IL

P – Sat - B - 171
Corneal Mechanical Properties After Crosslinking Treatments for
Keratoconus and Post-LASIK Ectasia
F. R. Gonzalez1, M. Lorenzo1, J. Dias1, and N. Ziebarth1
1University of Miami, Coral Gables, FL

P – Sat - B - 172
Use of Telecentric Lenses to Improve Optical Strain Analysis Techniques for
Soft Tissue Applications
C. O. Simmonds1, J. Favreau1, and G. Gaudente1
1Rutgers University, Plainfield, NJ, Worcester Polytechnic Institute, Worcester, MA

P – Sat - B - 173
Investigation of the efficacy of genipin solution as a possible treatment
for keratoconus
M. A. Lorenzo1, F. Gonzalez1, J. Dias1, and N. Ziebarth1
1University of Miami, Coral Gables, FL

P – Sat - B - 174
Correlation of Pullout Force of Kirschner (K-) Wire to Other Factors
Indicative of Bone Quality
S. C. Denning1, R. C. Pisano11, A. Dincer1, D. M. Ebenstein1, and E. A. Kennedy1
1Bucknell University, Lewisburg, PA

P – Sat - B - 175
Soft Substrate Does Not Inhibit Stretch Avoidance in U2OS Cells
N. Diamantides1, M. Monterossos1, M. Kural1, H. Cirka1, and K. Billiar1
1Bucknell University, Lewisburg, PA, 2Sweet Briar College, Sweet Briar, VA
3Worcester Polytechnic Institute, Worcester, MA

P – Sat - B - 176
Development of a Low-Cost Pericardiocentesis Simulator
F. Ruppe1, A. Rollando1, A. Becker1, L. Dufey1, D. Stern1, J. Baish1, D. Cawannah1, and S. Steinhu11
1Bucknell University, Lewisburg, PA, 2Geisinger Medical Center, Danville, PA

P – Sat - B - 177
Feasibility and Optimization Study for 3D Digital Reconstruction Procedure for
Embryonic Chick and Mouse Hearts
M. J. Hedgeland1, C. M. Buffinton1, A. M. Martens2, and A. M. Moon2
1Bucknell University, Lewisburg, PA, 2Geisinger Health System, Danville, PA

P – Sat - B - 178
Co-culture Conditions for Human Endothelial Cells and Skeletal Myoblasts
L. Rani1, C. S. Chedi1, and G. A. Truskey1
1Brown University, Providence, RI

P – Sat - B - 179
Characterization of Bioactive Components in Human Blood Clot
E. Kahn1, A. Doodlesack1, A. Kondo1, D. Ciombor1, and A. Zega1
1Brown University, Providence, RI

P – Sat - B - 180
Role of Mechanical Loading in Modulating Breast Cancer Metastasis-
Associated Osteoclastogenesis
P. Polamaraju1, M. Lynch1, M. Lee1, and C. Fischbach1
1Cornell University, Ithaca, NY

P – Sat - B - 181
Investigating RNA-DNA Difference (RDD) and Allelic Specific Expression
(ASE) using Next-Generation Sequencing and Bioinformatics
D. Doherty1
1Case Western Reserve University, Cleveland, OH

P – Sat - B - 182
Competitive Displacement Reaction for DNA Sequence Biosensors
Using a Stem-loop Hybridization Scheme
K. L. Giles1, S. H. Yazdi1, and I. M. White1
1University of Maryland, College Park, MD

P – Sat - B - 183
Mechanically Stimulated Osteoblasts Regulate the Proliferation and
Differentiation of Mesenchymal Stem Cells without Direct Contact
N. Gupta1, A. Yang1, E. Chan1, and C. Rubin1
1Case Western Reserve University, Cleveland, OH, 2Stony Brook University, Stony Brook, NY

P – Sat - B - 184
1000-Fold Macrofluidic Concentrator
G. R. Stuebe1, S. Wong1, D. Rantti1, M. Cabodi1, and C. Klapperich1
1Boston University, Boston, MA

P – Sat - B - 185
Differential Cell Response to Alternating Axis and Equibaxial Stretch
M. Monterossos1, N. Diamantides1, M. Kural1, H. Cirka1, and K. Billiar1
1Sweet Briar College, Sweet Briar, VA, 2Bucknell University, Lewisburg, PA
3Worcester Polytechnic Institute, Worcester, MA

P – Sat - B - 186
Studying Depth Perception to Aid Microsurgery: Developing a Novel
Visual Stimulus that Lacks Pictorial Depth Cues but Contains Sufficient
Information to Allow Stereopsis
K. Macdonald1, J. Galeotti1, J. Wang1, S. Horwath1, A. Zhang1, B. Wu1, and R. Klatzky1
1University of Pittsburgh, Pittsburgh, PA, 2Carnegie Mellon University, Pittsburgh, PA
3Arizona State University, Mesa, AZ
P – Sat - B - 187
Assessment of Design Gate Methods for Biomedical Senior Design Course
S. G. STAFFORD1 AND J. D. DESJARDINS1
1Clemson University, Simpsonville, SC; 2Clemson University, Clemson, SC

P – Sat - B - 188
Effectiveness of a Surface-Bound Antimicrobial Peptide as a Function of Tether Length for Combating Infections
A. DAVEY1, J. L. LOZEAU2, T. ALEXANDER2, AND T. CAMESANO2
1Case Western Reserve University, Cleveland, OH; 2Vanderbilt Polytechnic Institute, Worcester, MA

P – Sat - B - 189
Effects of Shear Stress on RNA Levels of Inflammatory and Fibrotic Mediators in Kidney Epithelial Cells
S. MIAO1, P. R. BRAKEMAN1, W. H. FISSELL1, AND N. FERRELL1
1Searle Systems Biology and Bioengineering Undergraduate Research Experience, Nashville, TN; 2Vanderbilt Institute for Integrative Biosystems Research and Education, Nashville, TN; 3University of California San Francisco, San Francisco, CA; 4Vanderbilt University School of Medicine, Nashville, TN

P – Sat - B - 190
Intercellular Adhesion Molecule 5 (ICAM-5) Metabolism and Neuroinflammation
Y. WU1, N. TONG1, AND H. GELBARD1
1University of Rochester, Rochester, NY; 2University of Rochester Medical Center, Rochester, NY

P – Sat - B - 191
The Role of Interferon Regulatory Factor 6 in Skin Homeostasis
K. HIXON1 AND M. DUNNWALD1
1The University of Iowa, Iowa City, IA

P – Sat - B - 192
The Interactions of Gold Nanoparticles with Model Cell Membranes
C. M. BAILEY1, K. L. WATERMAN1, J. B. MACEDONIO1, AND T. A. CAMESANO1
1Vanderbilt Polytechnic Institute, Worcester, MA

P – Sat - B - 193
Novel Protein Acts as Cryoprotectant for Human Embryonic Kidney Cell Monolayers
Q. OSGOOD1, N. CHAKRABORTY1, B. STOKICH2, AND M. MENZE2
1University of Michigan-Dearborn, Dearborn, MI; 2Eastern Illinois University, Charleston, IL

P – Sat - B - 194
Switchable Gene Expression for Behavioral Studies in C. Elegans
C. ZIEMINSKI1, B. ALTHUENER1, AND D. ALBRECHT1
1Western New England University, Springfield, MA; 2Vanderbilt Polytechnic Institute, Worcester, MA

P – Sat - B - 195
Quantifying the Effect of Different Colonoscope Techniques on a Simulated Colon Model
J. SHUI1, K. BIERLY1, E. GEEST1, AND D. DIEHL2
1Bucknell University, Lewisburg, PA; 2Gesinger Health System, Danville, PA

P – Sat - B - 196
Enhanced Secondary Metabolite Production in Streptomyces coelicolor through Mixed Fermentation
J. PHILLIPS1, C. GOODWIN1, AND J. MCLean1
1Vanderbilt University, Nashville, TN; 2Vanderbilt University, Nashville, TN

P – Sat - B - 197
Assessment of Mitigation on Mechanical Integrity Loss in Concurrent Disuse Osteopenia and OVX by Drug Therapy
K. N. AGARVAl1, D. ZHANG1, M. HU1, L. LIN1, AND Y-X. QIN1
1Stony Brook University, Stony Brook, NY

P – Sat - B - 198
Biomimetic Channels for In Vivo Blood Vessel Modeling and Nanoparticle Drug Delivery Applications
C. OH1, Y. LIU1, AND A. THOMAS1
1Lehigh University, Bethlehem, PA

P – Sat - B - 199
A Microfluidic Platform for Revealing Mechanoregulation of Endothelial Migration
J. M. VALDEZ1, N. JAMILPOUR1, AND P. K. WONG1
1University of Arizona, Tucson, AZ

P – Sat - B - 200
Developing “Nanogels” for Molecularly Triggered Drug Delivery
K. ABDELAHMANN1, R. DANSO1, AND T. BETANCOURT1
1University of Pittsburgh, Pittsburgh, PA; 2Texas State University, San Marcos, TX

P – Sat - B - 201
Enhancing the Durability of a Deposited Silver Nanoparticle Layer for Inhibiting Biofilm Growth
K. ABDELAHMANN1, C. LARIMER1, AND I. NETTLESHIP1
1University of Pittsburgh, Pittsburgh, PA

P – Sat - B - 202
C. TOMPKINS-RHOADES1, J. BLILEY1, AND K. MARRA1
1University of Pittsburgh, Pittsburgh, PA

P – Sat - B - 203
Method to Control Fluid Flow Rate Profile in Multi-Step Lateral Flow Assays
J. YANG1, J. BUSHER1, AND E. FUI
1University of Washington, Seattle, WA

P – Sat - B - 204
Observing the Uptake of HDL miRNAs by Placing Shear Stress on Human Aortic Endothelial Cells
J. HIGGINS1
1Vanderbilt University, Nashville, TN

P – Sat - B - 205
Creating Surface Chemistries That Control Fibronectin Presentation to Promote Keratinocyte Function
G. A. NORTLEY1, A. L. CLEMENT1, M. M. STANTON1, K. F. WANG1, M. E. SCHWARTZ2, K. C. VOLK1, C. R. LAMBERT1, T. A. CAMESANO1, AND G. D. PINIS1
1Georgia Institute of Technology, Atlanta, GA; 2Vanderbilt Polytechnic Institute, Worcester, MA; 3Bioengineering Institute, Worcester, MA; 4Drexel University, Philadelphia, PA

P – Sat - B - 206
Electron Transfer Mediator Increases Production Of 1,3-Propanediol In Bioelectrochemical Reactors
V. N. TRAN1, T. D. HARRINGTON1, A. MOHAMED1, AND H. BEYENAL1
1Washington State University, Pullman, WA

P – Sat - B - 207
Optimization of Heterodyne Chemistry for Complex Biochemical Reactions
M. DURKEE1, R. PLANCHARD1, H. TOWELL1, K. HUANG1, A. KOLE1, C. MARASCO1, AND J. WIKSWO1
1Vanderbilt University, Nashville, TN; 2Rice University, Houston, TX

P – Sat - B - 208
Sodium Salicylate Enhances Cytotoxic Effect of Artemisinin on Human Leukemia Molt-4 Cells
M. J. WICKERATH1 AND N. SINGH1
1University of Washington, Seattle, WA

P – Sat - B - 209
Engineering of a Hybrid IgG-IgA Fc Domain to Introduce New Effector Function to IgG
N. MEHTA1, W. KELTON1, AND G. GEORGIU1
1University of Texas at Austin, Austin, TX
Saturday, September 28, 2013
1:30PM – 3:00PM
PLATFORM SESSION – SAT – 2

Track: Tissue Engineering
OP - Sat - 2 – 1 - Room 6B

Musculoskeletal and Orthopedic Tissue Engineering III

Chairs: Karen Burg, Leo Q. Wan

1:30PM
Polydopamine-Coated PCL Shape Memory Polymer Foams for Bone Regeneration
D. J. Munoz-Pinto1, A. C. Jimenez-Vergara1, D. Zhang1, M. Grunlan1, and M. Hahn1
1Rensselaer Polytechnic Institute, Troy, NY; 2Texas A&M University, College Station, TX

1:45PM
Osteoinduction with Hydroxyapatite Nanoparticles for Enhanced Integration of Tissue Engineered Cartilage Constructs to Diseased Cartilage Mimics
R. Dua1 and S. Ramaswamy1
1Florida International University, Miami, FL

2:00PM
Improvement of the Enthesis in Engineered Ligaments Through Localized Growth Factor Release
A. Lee1 and K. Baar1
1University of California, Davis, Davis, CA

2:15PM
Guiding Chondrogenesis and Osteogenesis with Hydroxyapatite and BMP-2 Incorporated within High-Density hMSC Cultures for Bone and Cartilage Regeneration
P. N. Dang1, X. Yu1, C. Boweman1, W. L. Murphy1, and E. Alsb erg1
1Case Western Reserve University, Cleveland, OH; 2University of Wisconsin, Madison, WI

2:30PM
Autologous Stem Cell Recruitment for Articular Cartilage Regeneration
R. Gottardi1, M. Hwang1, M. Simson1, P. A. Manner1, J. Tan1, P. G. Alexander1, S. S. Little1, and R. S. Tuan1
1University of Pittsburgh, Pittsburgh, PA; 2IMED Foundation, Palermo, Italy; 3University of Washington, Seattle, WA

2:45PM
Functional Maturation of a Cell-Seeded Hyaluronic Acid Hydrogel-Based Engineered Nucleus Pulposus
D. Kim1, L. J. Smith1, M. Kim1, D. M. Elliott1, and R. L. Mauck1
1University of Pennsylvania, Philadelphia, PA; 2University of Delaware, Newark, DE

Track: Biomaterials
OP - Sat - 2 – 2 - Room 6C

Biomaterial Design I

Chairs: Brendon Baker, Xinqiao Jia

1:30PM
Elucidation of the Influence that Presentation Modality of Glycoconjugates has on Dendritic Cell Phenotype
N. A. Hotaling1, D. F. Smith1, D. M. Ratner1, R. D. Cummings1, and J. E. Babensee1
1Georgia Institute of Technology, Atlanta, GA; 2Emory University, Atlanta, GA; 3University of Washington, Seattle, WA

1:45PM
Label-Free Fluorescent Biodegradable Poly lactones
Z. Xie1, L. Liu1, H. Weng1, R. P. Mason1, L. Tang1, K. T. Nguyen1, and J. Yang1
1Pennsylvania State University, University Park, PA; 2University of Texas Southwestern Medical Center, Dallas, TX; 3University of Texas at Arlington, Arlington, TX

2:00PM
Antibacterial Properties of Biodegradable Magnesium Alloys for Ureteral Stent Applications
J. Y. Lock1, E. Wyatt1, S. Upadhyayula1, A. Whall1, V. Nunez1, V. I. Vulev1, and M. Liu1
1University of California, Riverside, Riverside, CA

2:15PM
The Effects of PEG Hydrogel Crosslinking Density and Network Homogeneity on Protein Diffusion
S. Lee1, X. Tong1, and F. Yang1
1Stanford University, Stanford, CA

2:30PM
Tetrazine Click Chemistry: The Right "Click" for Biomaterials?
D. L. Alge1, D. F. Donohue1, and K. S. Anseth1
1University of Colorado, Boulder, CO

2:45PM
Dual-Crosslinked Oxidized, Methacrylated Alginate/PEG Hydrogels for Bioadhesive Applications
O. Jeon1, J. E. Samorezov1, and E. Alsb erg1
1Case Western Reserve University, Cleveland, OH

Track: Biomaterials
OP - Sat - 2 – 3 - Room 606

Biomaterials for Controlling Cell Environment II

Chairs: Eben Alsb erg, Shilpa Sant

1:30PM
3D Tumor Cell Migration in Response to Matrix Heterogeneities
F. Bordeleau1, L. N. Tang1, and C. A. Reinhart-King1
1Cornell University, Ithaca, NY

1:45PM
Mineral Particle Incorporation within Embryonic Stem Cell Aggregates Induces Osteochondral Differentiation
Y. Wang1, X. Yu1, C. Baker1, W. Murphy1, and T. McDevitt1
1Georgia Institute of Technology, Atlanta, GA; 2University of Wisconsin, Madison, WI

2:00PM
Tailoring Biophysical Properties of Fibrin Gels for Bone Formation with Co-Cultured Progenitor Cells
K. C. Murphy1 and J. K. Leach1
1University of California Davis, Davis, CA
2:15PM
Gene Activated Collagen-GAG Scaffolds for Tendon Repair
R. A. HORTENSIS1, J. R. Bercraft1, D. W. Pack2, and B. A. Harley1
1University of Illinois at Urbana-Champaign, Urbana, IL; 2University of Kentucky, Lexington, KY

2:30PM
Direct Measurement of MMP Activity in 3D Cellular Microenvironments Using Fluorogenic Peptide Substrates
J. L. Leight1, D. L. Algiere1,2, and K. S. Aniseth3
1University of Colorado Boulder, Boulder, CO; 2Howard Hughes Medical Institute, Boulder, CO

2:45PM
Matrix-Integrin-Cytoskeleton Signaling Guides Force-Dependent Modulation of 3D Vessel Morphogenesis within Collagen Matrices
C. F. Whittington1, P. J. Critser1, R. V. Joshi4, M. C. Yoder1,2, and S. L. Voytek-Harin1,4
1Weldon School of Biomedical Engineering, Purdue University, West Lafayette, IN; 2Herman B. Wells Center for Pediatric Research, Indiana University School of Medicine, Indianapolis, IN; 3Department of Pediatrics, Indiana University School of Medicine, Indianapolis, IN; 4Department of Basic Medical Sciences, School of Veterinary Medicine, Purdue University, West Lafayette, IN

Track: Biomechanics
OP - Sat - 2 – 4 - Room 607

Multiscale Modeling
Chairs: Melissa Knothe Tate, Xiaodu Wang

1:00PM
Multiscale Modeling of Fine-Grained Platelet Suspension in Coarse-Grained Shear Flow Using Molecular Dynamics and Dissipative Particle Dynamics
C. Qiao1, P. Zhang1, M. Livelli1, J. Sherif2, J. S. Soares1, S. Pothapragada1, N. Zhang1, Y. Deng1, and D. Bluestein3
1Stony Brook University, Stony Brook, NY

1:15PM
The Effect of Freezing Preservation on the Tensile Material Properties of Liver Parenchyma
Y.C. Lu1 and C. D. Untariu2
1Virginia Tech, Blacksburg, VA

1:30PM
Multiscale Computational Modeling of the Dynamic Compressive Behavior of Porcine Liver Tissue
S. S. Patnaik1, J. Chen1, R. Prabhu2, M. F. Horstemeyer2, L. Williams1,2, and J. Liao3
1Mississippi State University, Mississippi State, MS; 2Center for Advanced Vehicular Systems, Mississippi State, MS; 3Vanderbilt University, Nashville, TN

1:45PM
Assessing the Biomechanical Role of the Linea Aspera Using Finite Element Analysis
S. R. Moore1, S. Mills2, and M. Knothe Tate1
1Case Western Reserve University, Cleveland, OH; 2Ludwig Maximilians University, Munich, Germany

2:00PM
Development of 10-Year-Old Child Pelvis and Lower Extremities Finite Element Model
M. Shen1, H. Mao1, H. Fan2, S. Lakshmanan1, and K. H. Yang1
1Wayne State University, Detroit, MI

2:15PM
Necking and Failure of Constrained Contractile 3D Microtissues: Role of Geometry and Stiffness
V. B. Shenyov1, H. Wang1, A. A. Voroskos2, T. Boudu1, J. R. Morgan2, and C. S. Chen3
1University of Pennsylvania, Philadelphia, PA; 2Brown University, Providence, RI; 3University of Pennsylvania, Philadelphia, PA

Track: Stem Cell Engineering
OP - Sat - 2 – 5 - Room 608

Mechanical Control of Stem Cells
Chairs: Adam J Engler, Sanjay Kumar

1:30PM
Substrate Stiffness and Ligand Presentation Regulate the Lineage Commitment of Hematopoietic Stem and Progenitor Cells via Myosin II-mediated Integrin Binding
J. S. Choi1 and B. A. Harley2
1University of Illinois at Urbana-Champaign, Urbana, IL; 2Institute for Genomic Biology, Urbana, IL

1:45PM
Combined Biophysical and Biochemical Cues Enhance the Function of an Aged Muscle Stem Cell Population
B. D. Cosgrove1, P. M. Gilbert1, E. Porpiglia1, S. P. Lee1, S. Y. Corbel2, and H. M. Blau2
1Stanford University School of Medicine, Stanford, CA

2:00PM
Engineering Interpenetrating Network Hydrogel as Stem Cell Niche with Independently Tunable Biochemical and Mechanical Properties (Invited)
X. Tong1 and F. Yang1
1Stanford University, Stanford, CA

2:15PM
Elongated Stem Cell Morphology and Matrix Stiffness Influences Lineage by Modulating Contractility
L. G. Vincent1, C. Tay2, Y. Cho1, J. Del Alamo1, L. Tan3, and A. J. Engler1
1University of California, San Diego, La Jolla, CA; 2National University of Singapore, Singapore, Singapore; 3Nanyang Technological University, Singapore, Singapore

2:30PM
Mesenchymal Stem Cell Mechanobiology Is Clone Dependent
C. M. McLeod1, T. P. Driscoll1, B. D. Cosgrove1, S. Heo1, and R. L. Mauck2
1University of Pennsylvania, Philadelphia, PA; 2Department of Veterans Affairs Medical Center, Philadelphia, PA

2:45PM
Cyclic Stretch Enhances Myogenic Differentiation of ASCs
P. Y. Huri1, C. A. Cook1, D. L. Hutton1, B. C. Goh2, D. J. DiGirigolo2, and W. L. Grayson1
1Johns Hopkins University, Baltimore, MD; 2Johns Hopkins University, Baltimore, MD

Track: Cancer Technologies
OP - Sat - 2 – 6 - Room 609

Nanotechnologies for Cancer Detection and Treatment I

Chairs: Harry Bermudez, Erik Dreaden

1:30PM
A Suite of Antibodies for Targeting Cancer-Associated Fibroblasts
J. A. Van Deventer1, S. Rajam1, S. S. Sidhu1, and K. D. Wittrup1
1Massachusetts Institute of Technology, Cambridge, MA; 2University of Toronto, Toronto, ON, Canada
1:45PM Multi-Modal Imaging of Genetically-Engineered Human T Cells for Targeting Tumor
P. BHATHAGADI, 1, M. ALAUDINN, 2, P. SEIFR, 1 J. A. BANKSON, 1 D. K. KIRUI, 1 H. HULS, 1 D. A. LEE, 1 A. BABAKHANI, 1 K. C. LIP, 1 AND L. J. COOPER 1
1Baylor College of Medicine, Houston, TX, 2Texas Children’s Hospital, Houston, TX, 3The University of Texas MD Anderson Cancer Center, Houston, TX, 4Rice University, Houston, TX, 5The Methodist Hospital Research Institute, Houston, TX, 6Wake Forest School of Medicine, Houston, TX

1:55PM Fluorescence Imaging of Tumors in the Second Near-infrared Optical Window Using a New Class of Hybrid Bio-nanomaterial Probes
D. GHOSH, 1 A. F. BAGLEY, 1 S. N. BHATIA, 1, AND A. M. BELCHER 1
1MIT, Cambridge, MA, 2Koch Institute for Integrative Cancer Research, Cambridge, MA

1:30PM Cardiac Progenitor Cells Release Pro-Survival microRNA-Loaded Exosomes that Enhance Angiogenesis and Mitigate Hypoxic Death
W. GRAY, 1 N. FINN 1, C. SEARLES 1, AND M. DAVIS 1
1Georgia Institute of Technology and Emory University, Atlanta, GA, 2Atlanta VA Hospital, Atlanta, GA

Track: Cardiovascular Engineering
OP - Sat - 2 – 8 - Room 604

Cardiac Regeneration and Stem Cells I

1:30PM Electrical Maturation and Integration of Human Pluripotent Stem Cell-Derived Cardiomyocytes (Invited)
M. LAFRAMME 1
1University of Washington, Seattle, WA

2:00PM Biological Wire: A New Platform for Maturation of Human Pluripotent Stem Cell Derived Cardiomyocytes In Vitro
S. S. NUNES 1, J. W. MIKLAS 1, J. LIU 1, R. ASCHER-SOBER 1, Y. XIAO 1, B. ZHANG 1, J. JIANG 1, S. MASSE 1, K. NAYTHAN ARAI 1, G. GROSS 1, P. BACK 1, G. KELLEY 1, AND M. RADISIC 1
1University Health Network, Toronto, ON, Canada, 2University of Toronto, Toronto, ON, Canada, 3Hospital for sick children, Toronto, ON, Canada

2:15PM Functional Maturation of Early Stage Cardiomyocytes via Mechanical Conditioning
M. D. T. NGUYEN 1, J. P. TINNEY 1, F. YUAN 1, B. B. KELLER 1, G. GIRIDHARAN 1, AND P. SETHU 1
1The University of Louisville, Louisville, KY

2:30PM Interactions Between Human Pluripotent Stem Cell Derived Cardiomyocytes and Polarized Macrophages
D. O. FREYTES 1, E. WRONA 1, R. ANFANG 1, A. MARTURANO 1, AND G. VUNJAK-NOVAKOVIC 1
1The New York Stem Cell Foundation, New York, NY, 2Columbia University, New York, NY

2:45PM Cardiac Regeneration and Stem Cells I (Invited)

Track: Cellular and Molecular Bioengineering
Microfluidic Platform II

**Chairs:** Savas Tay

**1:30PM**
**A High Throughput Functional Screen of Adhesive and Biofilm Bacterial Pathogenicity Landscapes**
W. M. Weisner, V. Milushevic, and D. Di Carlo
1. University of California Los Angeles, Los Angeles, CA
2. California NanoSystems Institute, Los Angeles, CA

**1:45PM**
**A micro-Hall Chip for Sensitive Detection of Bacteria**
D. Issadore, R. Weissleder, and H. Lee
1. University of Pennsylvania, Philadelphia, PA
2. Massachusetts General Hospital - Center for Systems Biology, Boston, Massachusetts

**2:00PM**
**Microfluidic Quantification of Single-Cell Cytokine Secretion Dynamics Under Time-Varying Inflammatory Inputs**
S. Tay and M. Junkin
1. ETH Zurich, Basel, Switzerland

**2:15PM**
**A Versatile Valving Toolkit Based on Expanding Elements for Automating Paper Fluidic Devices**
B. J. Tolej, J. Wang, M. Gupta, J. Busser, L. Lafleur, E. Fu, and P. Yager
1. University of Washington, Seattle, WA

**2:30PM**
**Cryogenic Photo-Chemical DNA Synthesis with Increased Yield in Microfluidic Platform**
S. S. Pandey, R. E. Fernandez, and C. Mastroangelo
1. University of Utah, Salt Lake City, UT

**2:45PM**
**SynVivo-BBB: Microfluidic Assay For Modeling The Blood Brain Barrier**
A. Smith, C. Garson, I. Mills, K. Bhatt, M. Aschner, B. Prabhakaranpandian, and K. Pant
1. CFD Research Corporation, Huntsville, AL
2. Vanderbilt University Medical Center, Nashville, TN

Track: Bioinformatics, Computational and Systems Biology

**OP - Sat - 2 – 11 - Room 615**

**Computational Bioengineering II**

**Chairs:** Kristen M. Naegle, Matthew A. Oberhardt

**1:30PM**
**Maximization of Rate of Entropy Production Reveals Growth Principles of Respiring Microorganisms**
1. Tel Aviv University, Tel Aviv, Israel
2. Princeton, NJ, Princeton, NJ
3. Agricultural Research Organization, Volcani Center, Neve Yaacov, Israel
4. Argonne National Laboratory, Argonne, Illinois

**1:45PM**
**A Higher-Order Generalized Singular Value Decomposition for Comparison of Global mRNA Expression from Multiple Organisms**
S. P. Ponnappali, M. A. Saunders, C. F. Van Loan, and O. Alter
1. Bloomberg LP, New York, NY
2. Stanford University, Stanford, CA
3. Cornell University, Ithaca, NY
4. University of Utah, Salt Lake City, UT

**2:00PM**
**Multi-Layer Motion Estimation for Fluoroscopic Imaging**
C. Rottmann, J. S. Presten, A. Cheryauka, L. Anderson, R. Whitaker, and S. Joshi
1. University of Utah, Salt Lake City, UT
2. GE Healthcare, Salt Lake City, UT

**2:15PM**
**Multiscale Modeling of Nanog Heterogeneity in Pluripotent Stem Cell Populations**
J. Wu and E. S. Tzankakis
1. Chemical and Biological Engineering, SUNY-Buffalo, Buffalo, NY
2. Biomedical Engineering, SUNY-Buffalo, Buffalo

**2:30PM**
**Quantifying Spatial Patterns of Mouse Embryonic Stem Cell Differentiation within Embryoid Bodies**
D. White, T. McDevitt, and M. Kemp
1. Georgia Institute of Technology, Atlanta, GA

**2:45PM**
**PTMScout: Understanding Protein Post-Translational Modifications**
M. Matlock, A. Holehouse, C. Zhang, and K. Naegle
1. Washington University in St Louis, St Louis, MO
1:30PM-3:00PM PLATFORM SESSIONS Sat-2 2013 | SEPTEMBER 28 | SATURDAY

Track: Drug Delivery
OP - Sat - 2 – 12 - Room 616
Nucleic Acid Delivery I

Chairs: Eben Alsberg, Katherine Whitehead

1:30PM
Degradable Lipid-like Materials with Predictable In Vivo siRNA Delivery Activity (Invited)
K. A. Whitehead1, R. Dorkin2, R. Langer2, and D. G. Anderson2
1Carnegie Mellon University, Pittsburgh, PA, 2Massachusetts Institute of Technology, Cambridge, MA

2:00PM
Identifying Key Parameters for Controlling the Shape of Polymer/DNA Nanoparticles
J-M. Williford1, Y. Ren1, K. Huang1, D. Pan2, and H-Q. Mao1
1Johns Hopkins University, Baltimore, MD

2:15PM
Magnetic Core-Shell Nanoparticle-Based microRNA and Hyperthermia Therapy to Enhance the Treatment of Brain Tumors
P. T. Yin1, B. P. Shah1, and K-B. Lee1
1 Rutgers University, Piscataway, NJ

2:30PM
Topically Applied Spherical Nucleic Acids to Increase the Rate of Wound Healing in Subjects with Non-Insulin Dependent-Dependent Diabetes Mellitus
P. S. Randeria1, D. Shipp1, X. Wang1, A. Paller2, and C. Mirkin1
1Northwestern University, Evanston, IL, 2Northwestern University, Chicago, IL

4:45PM
Functional Delivery of siRNA and DNA based on Mesoporous Silica Nanoparticles with Large Pores
D-H. Min1
1Seoul National University, Seoul, Korea, Republic of

Track: Biomedical Imaging and Optics
OP - Sat - 2 – 13 - Room 618
Molecular Imaging I

Chairs: Andrew Tsurkas

1:30PM
Dual-mode Prussian Blue Nanoprobes for Molecular Imaging of Eosinophilic Esophagitis
M. F. Dumont1, L. S. Conklin1,1, R. W. Sze1,2, and R. Fernandes1,2
1Children’s National Medical Center, Washington, DC, 2George Washington University, Washington, DC

1:45PM
Polymeric Vesicles as Novel Nanoplatforms for Tumor-targeted Molecular Imaging
Z. Cheng1 and A. Tsurkas1
1University of Pennsylvania, Philadelphia, PA

2:00PM
Au/Fe3O4 Nanocluster Probes for MRI/SPECT/CT Molecular Imaging of Cancer
S. Xue1, Y. Liu1, L. Zhang1, Y. Yang1, P. Liu1, C. Zhang1, and L. X. Xu1
1Shanghai Jiao Tong University, Shanghai, China, People’s Republic of

2:15PM
Safe Iron Oxide Nanoparticles Tailored for Magnetic Particle Imaging
R. M. Ferguson1, A. P. Khandhar2, H. Arami1, L. Hua1, J. Rahmer1, and K. M. Krishnan1
1University of Washington, Seattle, WA, 2Philips, Hamburg, Germany

2:30PM
Polarity-Sensitive NIR Fluorophore-Encapsulated Nanoparticles as Thermo-responsive and Lifetime Contrast Agent for Ultrasound-Switchable Fluorescence Imaging
M. Wei1,2, H. Pita1,3, Y. Liu1,2, Z. Xie1,2, J. U. Menon1,2, B. Cheng1,2, and K. T. Nguyen1,2, and B. Yuan1,2
1University of Texas at Arlington, Arlington, TX, 2The University of Texas Southwestern Medical Center at Dallas, Dallas, TX

2:45PM
Polymer Nanoparticle Based Exogenous Soft Tissue Contrast for Live In Vivo Embryonic Imaging
C. L. Gregg1, T. Derrien1, H. Zhao1, and J. Butcher1
1Cornell University, Ithaca, NY

Track: Drug Delivery
OP - Sat - 2 – 14 - Room 619
Targeted Delivery II

Chairs: Justin Saul, Fan Yang

1:30PM
Quantitative Control of Tumor Drug Uptake In Vivo Using Microbubble Contrast Agents
S. R. Sih1, J. J. Kandel1, D. J. Yamashiro2, and M. A. Borden1
1University of Colorado at Boulder, Boulder, CO, 2Columbia University Medical Center, New York City, NY

1:45PM
Image-Guided Magneto-Acoustic Gene Targeting to Tumors Prolongs Survival in Tumor-Bearing Mice
B. Chertok1, R. S. Langer1, and D. G. Anderson1
1MIT, Cambridge, MA

2:00PM
PLGA Nanoparticles Modified with Rabies Virus Glycoprotein (RVG) for Improved Brain Tumor Delivery
R. L. McCall1 and R. W. Sirbani1
1Barrow Neurological Institute, Phoenix, AZ

2:15PM
Enhanced Delivery and Imaging of Neurotherapeutics via US, MRI, SPECT
M. Valdez1, E. Yosimaru1, P. Ingram1, J. Totenhagen1, A. Forbes2, S. Moor1, P. Helquist1, T. Matsuura1, R. Witte1, L. Furen1, Z. Liu1, R. Erickson1, and T. Trouard1
1University of Arizona, Tucson, AZ, 2Notre Dame, Notre Dame, IN

2:30PM
Ultrasound-Assisted Convection Enhanced Drug Delivery to the Brain
M. Sistla1, G. Lewis1, A. Sarvazyan2, and W. Olbricht1
1Cornell University, Ithaca, NY, 2Zetarics, Inc., Ithaca, NY, 3Aranzine, Laboratories, West Trenton, NJ

2:45PM
Convection-Enhanced Delivery of Brain-Penetrating Nanoparticles in Glioma
J. Saucier-Sawyer1, Y-E. Seo1, J. Zhou1, A. Sawyer1, and W. Saltzman1
1Yale University, New Haven, CT
Track: Respiratory Bioengineering
OP - Sat - 2 – 15 - Room 620
Modeling Airway Physiology and Disease
Chairs: Samir Ghadiali, Marcel Filoche
1:30PM
Pulmonary Airway Reopening Utilizing Pulsatile Flow Waveforms
H. W. GLINDMEYER IV1, AND D. GAYER1
1 Tulane University, New Orleans, LA
1:45PM
Can Less Frequent Deep Breaths Be Protective in Asthma?
A. H. GOLNAF1, 2, R. S. HARRIS1, 2, J. G. VENEGAS1, 2, AND T. WINKLER1, 2
1 Massachusetts General Hospital, Boston, MA; 2 Harvard Medical School, Boston, MA
2:00PM
H. HANAFI1, L. POSADA1, AND G. N. MAKSYM1
1 Dalhousie University, Halifax, NS, Canada
2:15PM
Strain as a Primary Determinant for Reversal of Airway Bronchoconstriction
B. C. HARVEY1, H. PARAMESWARAN1, AND K. R. LUTCHEN1
1 Boston University, Boston, MA
2:30PM
Patient Specific Simulations of Forced Expiration Flow Volume Loops
A. PRADEL1, 2, K. BLANC1, 2, C. STRAUSS1, 3, T. SIMILOWSKI1, 3, AND M. FILOCH1, 3
1 Université Pierre et Marie Curie, Paris, France; 2 Assistance Publique - Hôpitaux de Paris, Groupe Hospitalier Pitié-Salpêtrière, Paris, France; 3 Ecole Polytechnique, Palaiseau, France
2:45PM
A Novel Graph Theoretical Transformation: Application for Pendullut in the Airways
S. D. AMIN1 AND B. SUKI1
1 Boston University, Boston, MA

Track: Undergraduate Research
OP - Sat - 2 – 16 - Room 613
Undergraduate Research I
Chairs: Stephanie Bryant, Kacey Marra
1:30PM
Quantifying Spinal Cord Cross-Sectional Area in Inflammatory Neurological Diseases
W. LIU1, R. MAISSOUD1, G. BRUNETTO1, D. REICH1, G. NAIR1, AND S. JACOBSON1
1 National Institute of Neurological Disorders and Stroke, Bethesda, MD; 2 University of Maryland, College Park, MD
1:39PM
A Comparison of Intracardiac ARFI and SWI for Imaging Radiofrequency Ablation Lesions
P. HOLLENDER1, L. KUO1, V. CHEN1, S. EYERLY1, G. TRAHEY1, AND P. WOLF1
1 Duke University, Durham, NC
1:48PM
3D Ultrasound Analysis of Angiostatin II-Induced Dissecting Murine Abdominal Aortic Aneurysms
H. D. SCHROEDER1, A. A. YINIO1, A. E. BOGUCKI1, AND C. J. GOERGEN1
1 Purdue University, West Lafayette, IN
1:57PM
4D Shape Analysis Applied to Post-operative Wall Motion Function Assessment of Extracardiac Total Cavopulmonary Connections
M. ECKMAN1 AND P. G. MENON1
1 Penn State University, State College, PA; 2 Sun Yet-sen University - Carnegie Mellon University Joint Institute of Engineering, Pittsburgh, PA
2:06PM
Optimum Lead Placement for Sudden Cardiac Risk Stratification in Cardiomyopathy Patients
A. M. ZELLER1 AND B. GHORAN1
1 Rochester Institute of Technology, Rochester, NY
2:15PM
Effects of Enterprise Stent Treatment on Basilar Tip Aneurysm Hemodynamics
J. LINDSAY1, P. NAIR1, J. RYAN1, AND D. FRAKES1
1 Arizona State University, Tempe, AZ
2:24PM
Adaptation to Shear Stress Explains the Spontaneous Regression of the Ductus Arteriosus
S. MUNAWAR1, U. MUHAMMAD1, M. ALBABA1, R. JAMESON1, H. AHMED1, A. MINZENNEYER1, AND C. QUICK1
1 Texas A&M, College Station, TX
2:33PM
In Vitro Cardiac Electrogram Monitoring System for Langendorff-perfused Guinea Pig Hearts
K. SHAH1, R. ZHU1, D. HUNTER1, AND L. TUNG1
1 Rice University, Houston, TX; 2 Johns Hopkins University, Baltimore, MD
2:42PM
Modulating the Neuro-inflammatory Response In Vitro by Treatment with Encapsulated hMSCs
J. A. HAWAYEK1, 2, E. STUCKY1, D. I. SHREIBER1, AND M. L. YARMUSH1
1 UPRM, Rio Grande, PR, Puerto Rico; 2 Rutgers, Piscataway, NJ
2:51PM
An Electrochemical Method for Detecting Autoinducer-2 Mediated Quorum Sensing
X. Y. ZHOU1, T. GORDONOV1, AND W. E. BENTLEY1
1 University of Maryland - College Park, College Park, MD
Saturday, September 28, 2013
3 – 3:15PM – 4:45PM
PLATFORM SESSION – SAT – 3

Track: Tissue Engineering
OP - Sat - 3 - 1 - Room 6B
Biomimetics for Tissue Engineering
Chairs: Deanna M Thompson

3:15PM
Engineering Functional Anisotropy in Scaffold-Free Fibrocartilage
R. F. MacBarb1, A. L. Chen2, J. C. Hu1, and K. A. Athanasiou1
1University of California, Davis, Davis, CA

3:30PM
Engineered Basement Membranes for Regeneration of the Corneal
R. N. Palchesko1,2, O. Creasey, J. L. Funderburgh1, and A. W. Feinberg1
1Carnegie Mellon University, Pittsburgh, PA, 2University of Pittsburgh, Pittsburgh, PA

3:45PM
Perfusion-decellularized Pancreas as a Natural Scaffold for Pancreatic
Tissue and Organ Engineering
S. Goh1, S. Bertha1, P. Olsen2, J. Candiello2, B. Sicari2, S. Johnson2, G. Uechi1, M. Balasubramani1, S. P. Badyal11,2, and I. Banerjee1 2
1University of Pittsburgh, Pittsburgh, PA, 2Children’s Hospital of Pittsburgh, Pittsburgh, PA

4:00PM
Discovering the Hepatoprotective Effect of Human Cathelicidins
using Organotypic Liver Models
L. Vu1, A. Barron2, and P. Rajagopalani1
1Department of Chemical Engineering Virginia Tech, Blacksburg, VA, 2Department of Bioengineering Stanford University, Stanford CA, Stanford, CA

4:15PM
Binding and Lubricating Properties of Biomimetic Boundary Lubricants
for Articular Cartilage
K. Samario1, M. Tan1, D. Putnam1, and L. Bonassar1
1Cornell University, Ithaca, NY

4:30PM
Differing Response of Disc Cell to Variations in 3D and Mechanical
Culture Conditions
D. Kim1, S. Heo1, L. J. Smith1, D. M. Elliott1, and R. L. Mauck1
1University of Pennsylvania, Philadelphia, PA, 2University of Delaware, Newark, PA

3:30PM
Cavitation Microrheology: New Tool to Quantify Mechanical Properties
within 3D Biomaterials
W. L. Stoppel1, S. B. Hutchens1, A. J. Crosby1, and S. C. Roberts1
1University of Massachusetts Amherst, Amherst, MA

3:45PM
Selenium Nanoparticles Coated Paper Towels Inhibiting the Growth
of Staphylococcus aureus and Pseudomonas aeruginosa
Q. Wang1 and T. J. Webster1
1Northeastern University, Boston, MA

4:00PM
Particulate Oxygen Generating Substances (POGS) as Oxygen Source
for Islet Isolation and Processing
J. P. McQuilling1, J. S. Sittadjooy1, B. S. Harrison1, A. C. Farney1, and E. C. Opara1
1Wake Forest University School of Medicine, Winston-Salem, NC
2Virginia Tech - Wake Forest University, Winston-Salem, NC

4:15PM
On-Demand Drug Delivery Using Ultrasound-Triggered Disruption
of Reversibly-Crosslinked Hydrogels
C. J. Kearney1, N. Huesch1, K. Zhao1, J. Kim1, C. Cezar1, S. Sudo2, and D. J. Mooney1
1Harvard University, Cambridge, MA, 2Wyss Institute, Cambridge, MA, 3Duke University, Durham, NC

4:30PM
Mineralized Biomaterials Induces Osteogenic Differentiation of Stem Cells through Adenosine Signaling
Y-R. V. Shih1, Y. Huang1, H. Kang1, A. Phadke1, and S. Varghese1
1UC San Diego, La Jolla, CA

Track: Biomaterials
OP - Sat - 3 - 2 - Room 606
Intelligent Biomaterials
Chairs: Todd McDevitt, Robert Mauck

3:15PM
Tunable Shape Memory Properties for a Minimally Invasive
Vascular Patch
T. C. Boire1, M. K. Gupta1, S. H. Lee1, and H-J. Sung1
1Vanderbilt University, Nashville, TN

3:30PM
Crosslinked and Bioreducible Poly(Beta-Amino Ester)-Based
Nanoparticles for Enhanced siRNA Delivery
K. L. Kozielski1, S. Y. Tzen1, and J. J. Green1
1Johns Hopkins University, Baltimore, MD

3:45PM
Strand Displacement Based Intracellular Computation Devices
B. B. Groves1, Y-J. Chen1, S. Pochekailov1, and G. Seelig1
1University of Washington, Seattle, WA

4:00PM
A Thermoresponsive Magnetic Nanoparticle System Using an Antiviral
Lectin for HIV Capture and Concentration
J. C. Phan1, J. J. Lai1, and K. A. Woodrow1
1University of Washington, Seattle, WA

4:15PM
Synergistically Enhanced Functions of Endograft by Integrating Thin
Layers of Nitinol and Silk
M. Shayan1, S. Yang1, W. Ryu1, and Y. Chun1
1University of Pittsburgh, Pittsburgh, PA, 2Yonsei University, Seoul, Korea, Republic of...
Track: Biomechanics
OP - Sat - 3 – 4 - Room 607

Clinical Biomechanics

Chairs: Barclay Morrison, Joel Stitzel

3:15PM
Myofascial Contributions to the Human Quadriceps During Passive Hip Flexion and Knee Extension
D. B. Lipps,1,2, E. Bailleul,1, T. G. Sandeck,1, and E. J. Perreault,1,2
1Rehabilitation Institute of Chicago, Chicago, IL; 2Northwestern University, Chicago, IL

3:30PM
Changes in Musculotendon Length with AF: A Musculoskeletal Modeling Case Study
H. Choi,1, K. Johnson,2, S. Fatone,1, and K. M. Steele1
1University of Washington, Seattle, WA; 2Seattle Children’s Research Institute, Seattle, WA

3:45PM
Muscle Synergy Complexity Decreases with Severity of Cerebral Palsy
K. M. Steele1, A. Rozumalski,2, and M. H. Schwartz2
1University of Washington, Chicago, IL; 2Gillette Children’s Specialty Healthcare, St. Paul, MN

4:00PM
Increased Rotational Loading During Stabilization Task 1 Year After ACL Injury
A. Lanier1,2, K. Manal,2, and T. Buchanan2
1University of Delaware, Newark, DE; 2Delaware Rehabilitation Institute, Newark, DE

4:15PM
The Development of Volumetric Organs from a Multi-Modality Image Dataset for Use in a Small Female Full Body Finite Element Model
M. Davis,1 A. Hayes,1 D. Moreno1, F. S. Gayzik1, and J. Stitzel1
1Virginia Tech-Wake Forest University, Winston Salem, NC

4:30PM
Kinetics Changes in Distal Arthrogryposis Skeletal Muscle with MYH3 R672C Mutation
A. W. Raccia,1 A. E. Beck,2 V. S. Rao,1 M. J. Bamshad1,2, and M. Regnier1
1University of Washington, Seattle, WA; 2Seattle Children’s Hospital, Seattle, WA

Track: Nanotechnologies for Cancer Detection and Treatment II
OP - Sat - 3 – 6 - Room 609

Chairs: Michael King, Aaron Mohs

3:15PM
Vortex Technology for CTC Extraction From Blood Samples
D. E. Go1, E. Sollier1, F. Che1, R. Kulkarni1, and D. Di Carlo1
1UCLA, Los Angeles, CA; 2Vortex Biosciences, Palo Alto, CA

3:30PM
LbL Nanoparticles for Combination Cancer Therapies: Receptor Targeting and Microenvironment Response
E. Dreden2, S. Morton2, J. Deng3, and P. Hammond1
1Koch Institute for Integrative Cancer Research, Cambridge, MA

3:45PM
A Multifunctional Nanoplatform for the Enhancement and Prediction of Therapeutic Response to External Beam Radiation Therapy
A. Al Zaki1, C. McGuade1, Y. Desai1, M. Vido1, T. Sakhija1, R. Hickey1, D. Joh1, S-J. Park1, G. Kao1, J. Dorsey1, and A. Tsourkas1
1University of Pennsylvania, Philadelphia, PA

Track: Self Assembling Biomaterials
OP - Sat - 3 – 5 - Room 608

Chairs: Lauren Black, Greg Hudalla

3:15PM
Self-assembling Polypeptide Nanoparticles That Display Thermally-triggered Shape Memory or Disassembly
F. Garcia Quiroz2 and A. Chilkoti1
1Duke University, Durham, NC

3:30PM
Self-Assembled Rosette Nanotube Composites Improve Skin Cell Functions
L. Sun1, H. Ferri2, and T. J. Webster1
1University of Alberta, Edmonton, AB, Canada

3:45PM
Highly Asymmetric Genetically Encoded Amphiphiles Spontaneously Assemble into Unexpected Morphologies
J. R. McDaniel1, K. B. Vargo1, I. Weitznider2, D. A. Hammer1, and A. Chilkoti1
1Duke University, Durham, NC; 2University of Pennsylvania, Philadelphia, PA

4:00PM
3D Self-assembling Peptide Gel Stiffness and Adhesiveness Affect hMSC Morphology and Gene Expression
N. Hugire3 and K. Gooch1
1The Ohio State University, Columbus, OH

4:15PM
Electrostatically Triggered Hydrophobic Self-Assembly of Protein Hydrogels
K. Baler1, M. Carignano1, G. Amea1, and I. Szleifer1
1Northwestern University, Evanston, IL

4:30PM
Spontaneous Solution and Interfacial Self-Assembly of Protein Surfactants
K. B. Vargo1, M. Cavallaro Jr1, K. J. Stebe1, and D. A. Hammer1
1University of Pennsylvania, Philadelphia, PA

Track: Self Assembling Biomaterials
OP - Sat - 3 – 5 - Room 608

Chairs: Lauren Black, Greg Hudalla

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1University of Pennsylvania, Philadelphia, PA

Track: Cancer Technologies
OP - Sat - 3 – 6 - Room 609

Chairs: Michael King, Aaron Mohs

3:15PM
Vortex Technology for CTC Extraction From Blood Samples
D. E. Go1, E. Sollier1, F. Che1, R. Kulkarni1, and D. Di Carlo1
1UCLA, Los Angeles, CA; 2Vortex Biosciences, Palo Alto, CA

3:30PM
LbL Nanoparticles for Combination Cancer Therapies: Receptor Targeting and Microenvironment Response
E. Dreden2, S. Morton2, J. Deng3, and P. Hammond1
1Koch Institute for Integrative Cancer Research, Cambridge, MA

3:45PM
A Multifunctional Nanoplatform for the Enhancement and Prediction of Therapeutic Response to External Beam Radiation Therapy
A. Al Zaki1, C. McGuade1, Y. Desai1, M. Vido1, T. Sakhija1, R. Hickey1, D. Joh1, S-J. Park1, G. Kao1, J. Dorsey1, and A. Tsourkas1
1University of Pennsylvania, Philadelphia, PA

Track: Cancer Technologies
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1University of Pennsylvania, Philadelphia, PA
4:00PM
DNA Nanostructures as Targeted and Therapeutic Delivery Vehicles for Cancer
P. Charoenphol1 and H. Bermudez1
1University of Massachusetts, Amherst, MA

4:15PM
Tethered Cationic Lipoplex Nanoparticles Detect Extracellular RNAs in Liver Cancer Mouse Models and Patients
X. Wang1, Y. Wu1, K. J. Kwak1, H. Kutay1, R. Sullivan1, C. Schmidt1, K. Ghoshal1, and J. L. Lee1
1The Ohio State University, Columbus, OH

4:30PM
Quantitative Sensing of microRNA inside Living Cells Based on Nanomaterial
S-R. Ryoo1 and D-H. Min1
1Seoul National University, Seoul, Korea, Republic of

Track: Cardiovascular Engineering
OP - Sat - 3 – 7 - Room 612

Cardiac Regeneration and Stem Cells II
Chairs: Gulden Camci-Unal, Michael Davis

3:15PM
Tracking Fusion of Human Mesenchymal Stem Cells (MSCs) Following Transplantation
B. Freeman1 and B. Ogle1
1University of Wisconsin-Madison, Madison, WI

3:30PM
Endocrine Protection of Ischemic Myocardium by FGF21 from the Liver and Adipose Tissue
S. Q. Lu1, D. Roberts2, A. Kharitonenkov2, Y. C. Li3, L-Q. Zhang4, and Y. Wu1
1Northwestern University, Evanston, IL, 2Lilly Research Laboratories, Indianapolis, IN, 3The University of Chicago, Chicago, IL, 4Rehabilitation Institute of Chicago, Chicago, IL

3:45PM
In Vivo Application of Dynamic Hyaluronic Acid Hydrogels
J. L. Young1, J. Tuler1, R. Braden1, P. Schup-Magoffin1, J. Schaefer1, K. Kretchmer1, K. L. Christman1, and A. J. Engler1
1University of California, San Diego, La Jolla, CA

4:00PM
Controlled Delivery of Sonic Hedgehog for Cardiac Regeneration
N. Johnson1 and Y. Wang1
1University of Pittsburgh, Pittsburgh, PA

4:15PM
Glypican-1 Proteoliposomes Enhance Angiogenic Activity of Delivered Growth Factors
A. J. Monteforte1 and A. B. Baker1
1University of Texas at Austin, Austin, TX

4:30PM
Comparative Studies of Ventricular Assist Devices and the Effect of Inflow and Outflow Cannulations
W-C. Chi1, Y. Alemu1, C. Gao1, B. Lynch1, S. Einau1, M. Slepian1, and D. Bluestein1
1Stony Brook University, Stony Brook, NY, 2MicroMed Cardiovascular Inc., Houston, TX, 3The University of Arizona, Tucson, AZ

track sponsored by Edwards
4:00PM
Polymer-DNA Nanocomplex Synthesis by “Microfluidic Drifting” Based Three-Dimensional Hydrodynamic Focusing Method
M. Lu1, Y-P. Ho2, C. Grigsby3, D. Ahmed1, A. A. NAWAZ1, K. LEONG1, and T. Huang1
1Pennsylvania State University, University Park, PA, 2Duke University, Durham, NC, 3Aarhus University, Aarhus, Denmark, 4Duke University, Durham

4:15PM
Quantitative Electrophoretic Mobility Shift Assays Enabled by Microsystems
Y. Pan1, T. A. Duncombe1, and A. E. Herr1
1University of California, Berkeley, Berkeley, CA

4:30PM
Measuring Neutrophil Speed and Directionality During Chemotaxis, Directly from a Droplet of Whole Blood
C. N. Jones1, A. Hoang1, L. Dimisko1, B. Hamza1, and D. Irwin1,2
1Harvard Medical School, Charlestown, MA, 2Shriners Hospital for Children, Boston, MA

Track: Bioinformatics, Computational and Systems Biology
OP - Sat - 3 – 11 - Room 615
Genomics, Transcriptomics and Proteomics II
Chairs: Valerie Daggett, Kimmen Sjölander
3:15PM
The PhyloFacts FAT-CAT Web Server: Functional Annotation and Ortholog Identification for Sequences Across the Tree of Life
K. SJOLANDER1
1University of California, Berkeley, Berkeley, CA

3:30PM
Inferring Single-Cell Gene Expression Frequencies From Stochastic Transcriptional Profiles
S. S. BAJKAR1, C. FUCHS1, A. ROLLER1, F. J. THEIS1, and K. A. JANES2
1University of Virginia, Charlottesville, VA, 2Helmholtz Center Munich, Munich, Germany

3:45PM
Misfolded Conformations of the Bovine Prion Protein at Acidic pH
C. CHENG1 and V. DAGGETT1
1University of Washington, Seattle, WA

4:00PM
Genome-wide Epigenetic Regulation in Endothelial Cells by Disturbed Flow and its Role in Atherosclerosis
J. DUN1,2, S. KIM1,2, C. QIU1,2, C. KIM1,2, R. HOFFMAN1,2, I. JANG1,2, and H. JO1,2
1Wallace H. Coulter Department of Biomedical Engineering, Georgia Institute of Technology and Emory, Atlanta, GA, 2Division of Cardiology, Department of Medicine, Emory University, Atlanta, GA

4:15PM
A Profile of RNA Editing in the Human Brain and Giomas
A. T. MAGIS1, C. C. FUNK1, and N. D. PRICE1
1University of Illinois, Urbana-Champaign, Urbana, IL, 2Institute for Systems Biology, Seattle, WA

4:30PM
Family Genomics Reveals Disease Genetics
A. STITTER1, H. COX1, H. LI1, S. AMENT1, P. M1,2, D. MAULDIN1, S. MONTSAROFF1, R. HUBLEY1, R. GELINAS1, M. BRUNKOW1, L. ROWE1, A. SMIT1, G. GLUSMAN1, J. ROACH1, and L. HOOD1
1Institute for Systems Biology, Seattle, WA, 2Luxembourg Centre for Systems Biomedicine, University Luxembourg, Esch-sur-Alzette, Luxembourg

Track: Drug Delivery
OP - Sat - 3 – 12 - Room 616
Nucleic Acid Delivery II
Chairs: Angelica Gonzalez, Katherine Whitehead
3:15PM
Directed Evolution of Adeno-Associated Virus for Enhanced Evasion of Human Neutralizing Antibodies
M. A. KOTTERMAN1, B-Y. HWANG1, D. STONE1, J. T. KOERBER1, L. COUTO2, F. MINDOZI2, K. HIGH1,2, and D. V. SCHAEFFER1,2
1University of California, Berkeley, Berkeley, CA, 2The Children’s Hospital of Philadelphia, Philadelphia, PA, 3The Children’s Hospital of Philadelphia, Philadelphia, 4University of California, Berkeley, Berkeley

3:30PM
Local and Sustained Silencing of Proline Hydroxylase 2 Increases Blood Vessel Production in Mice
C. E. NELSON1, A. HANNA1, F. YU1, J. M. DAVIDSON1, S. A. GUELCHER1, and C. L. DVAUL1
1Vanderbilt University, Nashville, TN
3:45PM
Layer-by-Layer for the Localized Delivery of siRNA
S. CASTLEBERRY1 and P. HAMMOND1
1MIT, Cambridge, MA

4:00PM
Enhancing Nonviral Gene Delivery to Human Mesenchymal Stem Cells through Upregulation of the Glucocorticoid Receptor
A.M. KELLY1, Z. HAN1, J. ZEMPLENI1, and A. K. PANNIER1, IRINGE GEORGIKOU1
1University of Nebraska-Lincoln, Lincoln, NE

4:15PM
Non-viral DNA Delivery Approach for High-Efficiency Nanog Transient Overexpression in Mesenchymal Stem Cells to Reverse the Effects of Organisal Aging
S. SON1, M-S. LIO1, P. LEI1, and S. T. ANDREADIS1,2
1State University of New York at Buffalo, Amherst, NY, and Center of Excellence in Bioinformatics and Life Sciences, Buffalo

4:30PM
Responsive, Targeted, and Therapeutic: Delivery Vehicles Entirely from DNA
J-W. KEUM1, P. CHARENPHOL1, and H. BERMUDEZ1
1University of Massachusetts, Amherst, MA

Track: Biomedical Imaging and Optics
OP - Sat - 3 – 13 - Room 618
Molecular Imaging II

Chairs: Irene Georgakoudi

3:15PM
Functionalized Magnetic Particle Imaging (MPI) Tracers as Multimodal Magneto/Optical Contrast Agents
H. ARAKI1, A. P. KHANHAR1, R. FERGUSON1, A. TAMITAKA-KAMI1, and K. M. KRISHNA1
1University of Washington, Seattle, WA

3:30PM
Protein Beacon Targeting of Inactive Heterotrimeric Guanine-Nucleotide Binding Protein in Live HeLa Cells
R. N. COTTE1, A. SUNDARARAGHAVAN1, J. HEPLER2, and G. BAO1
1Georgia Institute of Technology, Atlanta, GA, 2Emory University, Atlanta, GA

3:45PM
Imaging Cell Metabolism in Diabetic Wounds Using Endogenous Sources of Contrast
K. P. QUINN1, E. C. LEAL2, M. E. AUSTER2, A. VEVES3, and I. GEORGIKOU3
1Tufts University, Medford, MA, 2Beth Israel Deaconess Medical Center, Boston, MA

4:00PM
In Vivo Imaging of Inflammation in Carotid Ligation Mouse Model Using VCAM-Targeted Nanoparticles
N. MASOOD1, G. WEN1, and G. BAO1
1Georgia Institute of Technology, Atlanta, GA

4:15PM
Deep, Non-Invasive Imaging for Surgical Guidance of Sub-Millimeter Ovarian Tumor Resection Using Targeted Single-Walled Carbon Nanotubes
A. F. BAGLEY1, D. GHOSH1, Y. NAI1, M. BIRREY1, A. M. BELCHER1, and S. N. BHATIA1
1Koch Institute for Integrative Cancer Research/MIT, Cambridge, MA, 2Harvard Biophysics Program, Boston, MA, 3Department of Materials Science and Engineering/MIT, Cambridge, MA, 4Department of Medicine, Massachusetts General Hospital, Boston, MA, 5Howard Hughes Medical Institute, Chevy Chase, MD

4:30PM
Genetically Encoded Gas Nanostructures as Ultrasensitive Molecule Detectors
M. G. SHAPIRO3, P. W. GOODWILL1, A. NEDOY1, D. V. SCHAFER1, and S. M. CONOLLY1
1University of California at Berkeley, Berkeley, CA

Track: Drug Delivery
OP - Sat - 3 – 14 - Room 619
Targeted Delivery III

Chairs: Princess Imoukheude, Carlos Rinaldi

3:15PM
Cytosolic Delivery of Therapeutic Proteins Enabled by Engineered Pore-forming Proteins
N. YANG1 and D. WITTRUP1
1Massachusetts Institute of Technology, Cambridge, MA

3:30PM
Development of Neuron-Targeted Polymers for Nucleic Acid Delivery to Brain
H. WEI1, J. SCHELLINGER1, J. SHI1, D. CHU1, D. SELLERS1, D. MARIS1, P. CARLSON1, J. PAHANG1, P. HORNER1, and S. H. PUN1,2
1University of Washington, Seattle, WA, 2Institute of Molecular Engineering and Science, Seattle, WA

3:45PM
A Reservoir Intravaginal Ring Protects Macaques from Vaginal SHIV Infection
R. TELLER1, R. RASTOGI1, P. MESQUITA1,2, B. HEROLD1, and P. KISER1
1University of Utah, Salt Lake City, UT, 2Albert Einstein College of Medicine, Bronx, NY

4:00PM
Enhanced Vaginal Drug Delivery Using Hypotonic Vehicles
L. M. ENSIK1, T. HOEN1, K. MAISEL1, R. CONE1, and J. HANES1
1Johns Hopkins University, Baltimore, MD

4:15PM
Hyperthermia-Triggered Nanoparticle Assembly Controls Toxicity of Pro-Apoptotic Peptide Drug Cargo
S. MACEWAN1 and A. CHILKOTI1
1Duke University, Durham, NC

4:30PM
Seeking Hyperthermia Directed Therapeutics: Identification and Development of Thermally Sensitive Genetically-Encoded Polypeptide Nanoparticles
J. R. MCDANIEL1, X. LI1, and A. CHILKOTI1
1Duke University, Durham, NC

Track: Cancer Technologies
OP - Sat - 3 – 15 - Room 620
Biomarkers

Chairs: Utkan Demirici, Eduardo Reategui

3:15PM
Dynamic Biochemical Tissue Analysis of Colon Cancer Tissue Reveals Functional P-selectin Ligands Undetectable via Static Biochemical Tissue Analysis
E. W. MARTIN1, V. S. SHIRURE1, V. A. RESTO1, R. MALGOR1, D. J. GOETZ2, and M. M. BURDICK3
1Ohio University, Athens, OH, 2University of Texas-Medical Branch, Galveston, TX
3:30PM Detection and Identification of ccf-DNA Biomarkers Directly from CLL Cancer Patient Blood
M. J. HELLER1, A. SONNENBERG1, J. MARCINIAK1, and R. KRISHNAN2
1University of California San Diego, La Jolla, CA, 2University of California San Diego, La Jolla,
Biological Dynamics, La Jolla

3:45PM Uncovering Aggressive Cancer Cell Heterogeneity by Tumor Microenvironmental Glyco-conjugates
M. VESEY3, E. A. TURLEY1,2, and M. J. BISSELL1
1Lawrence Berkeley National Laboratory, Berkeley, CA, 2London Health Sciences Centre,
London, ON, Canada, 3University of Western Ontario, London, ON, Canada

4:00PM Coordinated PSA Biosensor Diagnostic and Prognostic Device
J. I. YEH1 and H. SHI1
1Univ of Pittsburgh SOM, Pittsburgh, PA

4:15PM Multiplexed Microfluidic Immunocapture of Circulating Pancreas Cells for the Early Detection of Pancreatic Carcinogenesis
F. I. THEGE1, S. M. SANTANA1, A. D. RHIM1, and B. J. KIRBY1,2
1Cornell University, Ithaca, NY, 2University of Pennsylvania, Philadelphia, PA, 3Well Cornell Medical College, New York, NY

4:30PM Circulating Tumor Cell Capture Amplification
A. N. HOANG1, A. SHAH2,3, T. BARBER1,2, M. PHILLIPS1,2, D. WINDKUR1,2, S. MAHESWARAN1, D. A. HABER1,2, S. L. STOTT1,2, and M. TONER1,2
1Harvard Medical School, Boston, MA, 2Surgical Services and BioMEMS Resource Center, Massachusetts General Hospital, Charlestown, MA, 3Massachusetts General Hospital Cancer Center, Charlestown, MA

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Track: Undergraduate Research

OP - Sat - 3 – 16 - Room 613

Undergraduate Research II

Chairs: Stephanie Bryant, Kacey Marra

3:15PM Optimizing a Drug-Loading Method for the Zero-Order Release of Rapamycin from Polyacrolactone Devices
L. A. ESTES1
1UCSF, San Francisco, CA, 2Pomona College, Claremont, CA

3:24PM Polymeric Nanoparticles for Modulated Clot Lysis in Abdominal Aortic Aneurysms (AAAs)
A. SYLVESTER1, B. SHIVAMAN1, and A. RAMAMURTHI1
1Cleveland Clinic, Cleveland, OH, 2Case Western Reserve University, Cleveland, OH

3:33PM Resveratrol Reduces Neurodegeneration and BBB Instability Around Intracortical Microelectrodes
A. BUCK1, K. POTTER1, W. SELF1, M. CALLANAN1, S. SUNIL1,2, and J. CAPADONA1,2
1Case Western Reserve University, Cleveland, OH, 2Advanced Platform Technology Center, L Stokes Cleveland VA Medical Center, Cleveland, OH

3:42PM Charge Reversing Endosomolytic Nanoparticles to Enhance Intracellular Bioavailability of siRNA
C. N. SWAIN1, C. E. NELSON1, and C. L. DUVALL1
1Washington University in St. Louis, St. Louis, MO, 2Vanderbilt University, Nashville, TN

3:51PM Multifunctional Hybrid Nanoparticles as a Co-delivery System for RNAs and Chemotherapeutics
G. P. HOWARD1, K. Y. CHOI1, O. R. FERREIRA SILVESTRE, and X. CHEN2
1The University of Akron, Akron, OH, 2National Institutes of Health, Bethesda, MD

4:00PM Conformal Conducting Polymer Electrodes Used with an Ionic Liquid Gel for Electroencephalography
C. L. JOHNSON1,2, P. LELEUX1, and G. MALLIANAS1
1Louisiana State University, Baton Rouge, LA, 2CMP-EMSE, Gardanne, France

4:09PM Quantification of Chronic Cortical Functionality Using Local Field Potential Recorded From the Mouse Visual Cortex
Z. GUGEL1, T. D. KOZAI, and X. T. CV1
1University of Pittsburgh, Pittsburgh, PA

4:18PM Mapping Somatosensory Cortex after Chronic Paralysis with Sensory- and Motor-Based Tasks for BCI Applications
M. RANDAZZO1, J. COLLINS1, D. WEBER1,2, and S. FOLDES3
1University of Pittsburgh, Pittsburgh, PA, 2Center for Neural Basis of Cognition, Pittsburgh, PA, 3VA Pittsburgh Healthcare System, Pittsburgh, PA

4:27PM Computational Optimization of Electractive Femoral Implants
A. DOUGLAS1, E. ZELLMER1, and M. MACIEWANI
1Washington University in St. Louis, Saint Louis, MO, 2Washington University School of Medicine, Saint Louis, MO

4:36PM Telomere Overhang Accessibility to Telomerase and ALT Proteins Depends on Telomeric Repeat Number
J. S. CALVERT1, H. HWANG1, A. KREIG1, and S. MYONG1
1University of Illinois at Urbana-Champaign, Champaign, IL
Introducing the 2014 Young Innovators Issue
Edited by David Mooney, Cynthia Reinhart-King and David Schaffer

Self nominations due November 1, 2013

- Special Issue will feature 15 – 20 original research papers from outstanding young faculty in cellular and molecular bioengineering.
- Accepted authors will be invited to present their work in a special platform session at the 2014 BMES Annual Meeting.
- To be eligible, candidates must be BMES members and hold a position at the Assistant Professor level or equivalent.
- Self nominations should include manuscript title with 200-word abstract, and a 2-page NIH-style biosketch, emailed to mike.king@cornell.edu.

Key Dates:
Nomination Deadline: November 1, 2013
Abstract Acceptance: December 1, 2013
Manuscript Submission: February 1, 2014
Print Publication: September 2014
Sheraton Seattle
1400 Sixth Avenue
Seattle, WA 98101
206-621-9000

Sheraton Seattle Hotel – Meeting Room Floor Plans
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<td>Modeling of Regulatory Networks Room 615</td>
<td>Analysis and Control of Cell Signaling I Room 615</td>
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<td>BIOMATERIALS</td>
<td>Micro and Nanostructured Materials I Room 6C</td>
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<td>Biomaterial Scaffolds I Room 6E</td>
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<td>BIOMECHANICS</td>
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<td>BIOMEDICAL ENGINEERING EDUCATION</td>
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<td>Imaging Strategies for Cancer Detection and Treatment Room 609</td>
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<td>CARDIOVASCULAR ENGINEERING</td>
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<td>Thrombosis and Hemostasis Room 612</td>
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<td>Bio-Inspired Materials for the Treatment of Arterial Disease Room 6B</td>
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<td>Cardiovascular Biomechanics Room 608</td>
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<td>CANCER TECHNOLOGIES</td>
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<td>DEVICE TECHNOLOGIES AND BIOMEDICAL ROBOTICS</td>
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<td>DRUG DELIVERY</td>
<td>Novel Materials and Self Assembly Room 620</td>
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<td>NANO AND MICRO TECHNOLOGIES</td>
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<td>Human on Chip</td>
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<td>NEURAL ENGINEERING</td>
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<td>TISSUE ENGINEERING</td>
<td>Bio-Inspired Materials for the Treatment of Arterial Disease</td>
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<td>Musculoskeletal Tissue Engineering I – Biomechanics and Tissue Repair</td>
<td>Smart Materials &amp; Tissue Engineering</td>
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<td>TRANSLATIONAL BIOMEDICAL ENGINEERING</td>
<td>Therapeutic and Diagnostic Biomedical Devices</td>
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<td>OTHER</td>
<td>1:30-5:00PM</td>
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<td>Korea – US Joint Workshop in Biomedical Engineering</td>
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<td>BMES-NSF Special Session: Promoting and Sustaining Innovative Research</td>
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<td><strong>CANCER TECHNOLOGIES</strong></td>
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<td>Microvascular and Lymphatic System Room 612</td>
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<td>Tissue Engineered Models for Study of Disease and Drug Discovery I Room 6B</td>
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## PROGRAM AT-A-GLANCE
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<tr>
<th>Track</th>
<th>8:00am – 9:30am</th>
<th>1:30pm -2:30pm</th>
<th>2:45pm – 3:45pm</th>
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<tr>
<td><strong>NEURAL ENGINEERING</strong></td>
<td>Brain Computer Interface</td>
<td>Neural Imaging</td>
<td>Deep Brain Stimulation</td>
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<td>Room 613</td>
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<td></td>
<td></td>
<td>Neural Tissue Engineering: Brain, Motor Neurons, Eye</td>
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</tr>
<tr>
<td><strong>NEW FRONTIERS &amp; SPECIAL TOPICS</strong></td>
<td>Emerging Technology I</td>
<td>Emerging Technology II</td>
<td></td>
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<tr>
<td></td>
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<td>Room 614</td>
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<tr>
<td><strong>ORTHOPEDIC AND REHABILITATION ENGINEERING</strong></td>
<td>Musculoskeletal and Orthopaedic Tissue Engineering I</td>
<td>Neural Tissue Engineering</td>
<td>Sports Biomechanics</td>
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<td>Room A313</td>
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<td>Rehabilitation and Human Applications</td>
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<td><strong>RESPIRATORY BIOENGINEERING</strong></td>
<td>Lung Development and Regeneration:Bioengineering and Mechanotransduction</td>
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<td>Surfactants and Mucus</td>
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<td>Bioprocessing of Human Cells</td>
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<tr>
<td><strong>TISSUE ENGINEERING</strong></td>
<td>Tissue Engineered Models for Study of Disease and Drug discovery I</td>
<td>Cardiovascular Tissue Engineering III</td>
<td>Cardiovascular Tissue Engineering IV</td>
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<td>Room 6B</td>
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<td>Musculoskeletal and orthopaedic Tissue Engineering I</td>
<td>Cell Delivery and Cell Homing Technologies</td>
<td>Neural Tissue Engineering: Brain, Motor Neurons, Eye</td>
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<td><strong>TRANSLATIONAL BIOMEDICAL ENGINEERING</strong></td>
<td>Biomaterials for Regenerative Medicine</td>
<td>Cell-based Products for Regenerative Medicine</td>
<td>Translation in Regenerative Medicine</td>
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<td><strong>OTHER</strong></td>
<td>Whitaker Session</td>
<td>Health Disparities: Innovative Approaches to Improved Health</td>
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<td>Computational Bioengineering I Room 615</td>
<td>Computational Bioengineering II Room 615</td>
<td>Genomics, Transcriptomics and Proteomics II Room 618</td>
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<td>Analysis and Control of Cell Signaling II Room 602</td>
<td>Dynamics of Biological Systems Room 602</td>
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<td>Biomaterials for Controlling Cell Environment I Room 606</td>
<td>Biomaterial Design I Room 6C</td>
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<td>Intelligent Biomaterials Room 606</td>
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<td>Self Assembling Biomaterials Room 608</td>
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<td>Computer-Aided Biomechanical Analysis Room 607</td>
<td>Multiscale Modeling Room 607</td>
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<td>Vascular and Pulmonary Imaging Room 616</td>
<td>Molecular Imaging I Room 618</td>
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<td>Novel Approaches Room 618</td>
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<td><strong>CANCER TECHNOLOGIES</strong></td>
<td>Engineering Anti-tumor Immunity Room 609</td>
<td>Nanotechnologies for Cancer Detection and Treatment I Room 609</td>
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<td>Vascular Mechanics II Room 612</td>
<td>Cardiac Regeneration and Stem Cells I Room 612</td>
<td>Cardiac Regeneration and Stem Cells II Room 612</td>
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<td>Cell Biomechanics I Room 604</td>
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<td>Cellular Bioengineering Room 604</td>
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<td>Molecular Bioengineering Room 6E</td>
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<td>Targeted Delivery II Room 619</td>
<td>Targeted Delivery III Room 619</td>
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<td>Nucleic Acid Delivery I Room 616</td>
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<td><strong>NANO AND MICRO TECHNOLOGIES</strong></td>
<td>Microfluidic Platform I Room 611</td>
<td>Microfluidic Platform II Analysis and Control of Cell Signaling II Room 611</td>
<td>Microfluidic Platform III Room 611</td>
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<td><strong>NEURAL ENGINEERING</strong></td>
<td>Neural Engineering: From Basic Studies to Translation Room 613</td>
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<td>Musculoskeletal and Orthopedic Tissue Engineering II Room 6B</td>
<td>Musculoskeletal and Orthopedic Tissue Engineering III Room 6</td>
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<td><strong>RESPIRATORY BIOENGINEERING</strong></td>
<td>Ventilation and Ventilation-Induced Injury</td>
<td>Modeling Airway Physiology and Disease</td>
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<td>Vascular and Pulmonary Imaging</td>
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<tr>
<td><strong>STEM CELL ENGINEERING</strong></td>
<td>Directing Stem Cell Differentiation</td>
<td>Mechanical Control of Stem Cells</td>
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<tr>
<td><strong>TISSUE ENGINEERING</strong></td>
<td>Musculoskeletal and Orthopedic Tissue Engineering II</td>
<td>Musculoskeletal and Orthopedic Tissue Engineering III</td>
<td>Biomimetics for Tissue Engineering</td>
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<td>Tissue Engineered Models for Study of Disease and Drug Discovery II</td>
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<td><strong>TRANSLATIONAL BIOMEDICAL ENGINEERING</strong></td>
<td>Translational Therapeutics and Imaging</td>
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<td>Undergraduate Research I</td>
<td>Undergraduate Research II</td>
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## WEDNESDAY, September 25, 2013

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<tr>
<th>Time</th>
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<tbody>
<tr>
<td>11:00am – 7:00pm</td>
<td>Registration</td>
<td>WSCC, 4C</td>
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<tr>
<td>8:30am – 4:30pm</td>
<td>BMES Board of Directors Meeting</td>
<td>WSCC, 211</td>
</tr>
<tr>
<td>3:30pm – 5:30pm</td>
<td>Meet the Faculty Candidates</td>
<td>WSCC, Exhibit Hall 4AB</td>
</tr>
<tr>
<td>5:30pm – 7:00pm</td>
<td>Welcome Reception</td>
<td>WSCC, Skybridge</td>
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**AFFILIATE EVENTS:**

- **8:30am – 5:30pm**  
  **BME – IDEA Alliance Meeting**  
  Washington State Convention Center, Room 2A2B

- **1:00pm – 5:00pm**  
  **AIMBE Board of Directors Meeting**  
  Washington State Convention Center, Room 203

- **7:00pm - 10:00pm**  
  **Annals of Biomedical Engineering - Editorial Board**  
  Sheraton Seattle, Greenwood Room
### THURSDAY, September 26, 2013

<table>
<thead>
<tr>
<th>Time</th>
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<tbody>
<tr>
<td>7:00am – 6:00pm</td>
<td>Registration</td>
<td>WSCC, 4C</td>
</tr>
<tr>
<td>8:00am – 9:30am</td>
<td>Platform Sessions - Thurs-1</td>
<td>WSCC - 18 concurrent rooms</td>
</tr>
<tr>
<td>8:00am - 9:00am</td>
<td>International Affairs Committee Meeting</td>
<td>WSSC, Room 214</td>
</tr>
<tr>
<td>8:30am – 10:00am</td>
<td>National Meetings Committee Meeting</td>
<td>WSCC, 601</td>
</tr>
<tr>
<td>9:00am - 10:00am</td>
<td>Choosing a Career Pathway in BME That’s Right for You</td>
<td>WSCC, 2AB</td>
</tr>
<tr>
<td>9:30am – 5:00pm</td>
<td>Exhibit Hall Open</td>
<td>WSCC, Exhibit Hall 4AB</td>
</tr>
<tr>
<td>9:30am – 1:00pm</td>
<td>Poster Session – Thurs - A</td>
<td>WSCC, Exhibit Hall 4AB</td>
</tr>
<tr>
<td>9:30am – 10:30am</td>
<td>Poster Viewing with Authors &amp; Refreshment Break</td>
<td>WSCC, Exhibit Hall 4AB</td>
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<tr>
<td>10:30am – 11:45</td>
<td>Plenary Session</td>
<td>WSCC, 6E</td>
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<tr>
<td>12:00noon – 1:15pm</td>
<td>Celebration of Minorities in BME Luncheon</td>
<td>WSCC, 6A</td>
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<tr>
<td>12noon – 1:30pm</td>
<td>Lunch on Your Own</td>
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<tr>
<td>1:00pm - 2:00pm</td>
<td>Membership Committee Meeting</td>
<td>WSCC, 214</td>
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<tr>
<td>1:30pm – 2:45pm</td>
<td>BME Careers in Industry</td>
<td>WSCC, 2AB</td>
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<tr>
<td>1:30pm – 5:30pm</td>
<td>One on One Career Consulting</td>
<td>WSCC, 212, 213</td>
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<tr>
<td>1:30pm – 3:30pm</td>
<td>Resume Review &amp; Critique</td>
<td>WSCC, 307, 308</td>
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<tr>
<td>1:45pm - 3:15pm</td>
<td>Mock Interview Demonstration</td>
<td>WSCC, 310</td>
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<tr>
<td>1:30pm – 5:00pm</td>
<td>Poster Session – Thurs - B [See pages 2-2]</td>
<td>WSCC, Exhibit Hall 4AB</td>
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<tr>
<td>1:30pm – 3:00pm</td>
<td>Platform Session – Thurs - 2</td>
<td>WSCC - 18 concurrent rooms</td>
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<td>1:30pm - 5:00pm</td>
<td>ABET Workshop</td>
<td>WSCC, Room 603</td>
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<td>1:30pm - 5:00pm</td>
<td>BMES-NSF Special Session</td>
<td>WSSC, Room 204</td>
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<td>WSCC, Exhibit Hall 4AB</td>
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<tr>
<td>3:15pm – 4:30pm</td>
<td>BME Careers in Government</td>
<td>WSCC, 2AB</td>
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<td>4:00pm – 5:30pm</td>
<td>Platform Session – Thurs - 3</td>
<td>WSCC - 18 concurrent rooms</td>
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<td>4:00pm - 5:30pm</td>
<td>Korea-US Joint Workshop in Biomedical Engineering</td>
<td>WSSC, Room 201</td>
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<td>4:00pm – 6:00pm</td>
<td>Resume Review &amp; Critique, repeated</td>
<td>WSCC, 307, 308</td>
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<tr>
<td>4:00pm – 5:30pm</td>
<td>Mock Interview Demonstration, repeated</td>
<td>WSCC, 310</td>
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<tr>
<td>5:00pm – 6:15pm</td>
<td>BME Careers in Academia</td>
<td>WSCC, 6E</td>
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<td>5:45pm – 7:15pm</td>
<td>BME State of the Society Town Hall &amp; Award Ceremony</td>
<td>WSCC, 6E</td>
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<tr>
<td>8:00pm – 9:00pm</td>
<td>University Receptions</td>
<td>Sheraton</td>
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### AFFILIATE EVENTS:

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<th>Event</th>
<th>Location</th>
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<tr>
<td>12noon – 1:30pm</td>
<td>Cellular and Molecular Bio-engineering - Editorial Board</td>
<td>Sheraton Seattle, Greenwood Room</td>
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<td>3:00pm – 4:00pm</td>
<td>AIMBE Council Meeting</td>
<td>Washington State Convention Center, Room 203</td>
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<td>4:00pm – 5:00pm</td>
<td>AEMB Annual Grand Meeting</td>
<td>Washington State Convention Center, Room 303</td>
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<td>5:30pm – 7:00pm</td>
<td>AEMB Reception</td>
<td>Sheraton Seattle, Daily Grill Restaurant</td>
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### FRIDAY, September 27, 2013

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<td>Platform Sessions - Fri-1-1</td>
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<td><strong>2014 Annual Meeting Planning Committee Meeting</strong></td>
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<td>2014 Annual Meeting Planning Committee Meeting</td>
<td>WSCC, 601</td>
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<td>BMES Student Chapter—Outstanding Chapter Best Practices</td>
<td>WSCC, 2A2B</td>
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<tr>
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<td>BMES Student Chapter - Outreach and Mentoring Best Practices</td>
<td>WSCC, 2A2B</td>
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<td>9:30am – 5:00pm</td>
<td>Exhibit Hall Open</td>
<td>WSCC, Exhibit Hall 4AB</td>
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<tr>
<td>9:30am – 1:30pm</td>
<td>Poster Session – Fri - A</td>
<td>WSCC, Exhibit Hall 4AB</td>
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<td>Poster Viewing with Authors &amp; Refreshment Break</td>
<td>WSCC, Exhibit Hall 4AB</td>
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<tr>
<td>10:30am – 12noon</td>
<td>Plenary Session</td>
<td>WSCC, 6E</td>
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<td>Lunch on Your Own</td>
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<td>Woman in BME Luncheon</td>
<td>WSCC, 6A</td>
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<td>Career Fair</td>
<td>WSCC, South Lobby</td>
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<td>1:30pm – 5:00pm</td>
<td>Poster Session – Fri - B</td>
<td>WSCC, Exhibit Hall 4AB</td>
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<td><strong>repeated</strong></td>
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<td>1:30pm – 5:30pm</td>
<td>One on One Career Consulting, repeated</td>
<td>WSCC, 212, 213</td>
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<td>Resume Review &amp; Critique, repeated</td>
<td>WSCC, 307, 308</td>
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<td>Platform Session – Fri - 2</td>
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<td>Platform Session – Fri - 3</td>
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<td>Diversity Committee Meeting</td>
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<td>4:45pm – 6:00pm</td>
<td>Plenary Session</td>
<td>WSCC, 6E</td>
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<td>7:00pm – 10:00pm</td>
<td>BMES BASH</td>
<td>Experience Music Project</td>
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#### AFFILIATE EVENTS:

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<th>Event</th>
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<tr>
<td>12noon – 1:30pm</td>
<td>Cardiovascular Engineering and Technology</td>
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<td><strong>Sheraton Seattle,</strong></td>
<td><strong>Capitol Hill Room Room</strong></td>
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<td>9:00am – 10:00am</td>
<td>AEMB Ethics Session</td>
<td>Washington State</td>
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<td><strong>Convention Center, Room 303</strong></td>
<td><strong>Convention Center</strong></td>
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<td>2:00pm – 3:00pm</td>
<td>AIMBE-AEMB Student Public Policy Session</td>
<td>Washington State</td>
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<td><strong>Convention Center Room 303</strong></td>
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<td>Registration</td>
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<td><strong>Platform Sessions - Sat-1</strong></td>
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<td>Education Committee Meeting</td>
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<td>WSCC, Exhibit Hall 4AB</td>
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<td>9:30am – 10:30am</td>
<td>Poster Viewing with Authors &amp; Refreshment Break</td>
<td>WSCC, Exhibit Hall 4AB</td>
</tr>
<tr>
<td>10:30am – 12noon</td>
<td><strong>Plenary Session</strong></td>
<td>WSCC, 6E</td>
</tr>
<tr>
<td></td>
<td>Rita Schaffer Young Investigator Lecture &amp; Diversity Award Winner</td>
<td></td>
</tr>
<tr>
<td>12:30pm – 3:00pm</td>
<td>BMES Board of Directors Meeting</td>
<td>WSCC, 211</td>
</tr>
<tr>
<td>12noon – 1:30pm</td>
<td>Lunch on Your Own</td>
<td></td>
</tr>
<tr>
<td>1:30pm – 3:00pm</td>
<td><strong>Platform Session – Sat - 2</strong></td>
<td>WSCC - 17 <strong>concurrent rooms</strong></td>
</tr>
<tr>
<td>3:15pm – 4:15pm</td>
<td><strong>Platform Session – Sat - 3</strong></td>
<td>WSCC - 17 <strong>concurrent rooms</strong></td>
</tr>
</tbody>
</table>
2013 BMES Annual Meeting

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