Biomedical Engineering at University of Memphis & University of Tennessee Health Science Center

Fall Term 2013

Message from UoM Chair and UTHSC Director of Joint BME Programs

William (Bill) M. Mihalko (left) and Eugene C. Eckstein (right) at the Joint Program booth during the BMES meeting in Seattle WA, September 2013.

WELCOME!

This is our Fall (2nd) issue of the Joint BME Program bi-annual e-newsletter! Being the 1st year of the e-newsletter, we are thrilled with the many responses from alumni and constituents about sharing news and events. I (Gene) am glad to return as Chair on the UoM-campus after having served a year as Interim-Dean, an enlightening experience that I thoroughly enjoyed. I (Bill) am having fun with teaching a new class this Fall in orthopedic anatomy/physiology with the use of cadaveric materials. We thoroughly enjoyed attending the 2013 BME conference in Seattle Washington in October and want to thank Dr. Roan for helping us with the banners and other materials for our booth (see image left), and for the students who helped man the booth during the conference. It was the first conference for several of the students and it is with pride that we see them excited about the many research presentations, professional development and networking activities as well as presenting their own great research. We hope to find ways to get more students to these important events in the future. Based on comments we received from the first e-newsletter, we have included names and email links to the current faculty and have also included some student highlights. We look forward to hearing from you on any news that you would like to share and please do not hesitate to contact us for questions, comments or ideas.

Until next time, best wishes!

Gene Eckstein & Bill Mihalko

CURRENT FACULTY and STUDENT ENROLLMENTS

We welcomed 7 new graduate students to the joint program 2013. From left to right BACK: Aaryani Tipirneni, Chloe Chung, Dema Assaf, Brandon Martin, Cheyenne Rhodes, Michael Parker, (not present; Stephen Gilley) FRONT: current student club officers: Lauren Eichaker and Ashley Cox

Bioelectricity/Biosensors: Amy Curry (UoM), Eugene Eckstein (UoM), Erno Lindner (UoM), Brad Pendley (UoM)
Biomaterials/Regenerative Medicine: Joel Bumgardner (UoM), Weikuan Gu (UTHSC), Warren Haggard (UoM), Karen Hasty (UTHSC), Gary Bowlin (UoM), Amber Jennings (UoM), Richard Smith (UTHSC)
Biomechanics: Denis DiAngelo (UTHSC), Brian Kelly (UTHSC), Bill Mihalko (Campbell Clinic/UTHSC), Esra Roan (UoM), John Williams(UoM)

There are over 50 adjunct faculty. Ms Jane Mitchell & Ms Melanie James are the administrative assistants for the programs on the respective campuses. Please visit http://www.uthsc.edu/bme/ and or http://www.memphis.edu/bme/index.php to see complete list of current faculty and staff, contact information and areas of expertise.

There are 42 graduate students (27 MS, 15 PhD) in the Joint Program and 141 undergraduate students in the BS program at UoM.

BME FACULTY FOCUS: UTHSC-Campus

Dr. Mihalko in arthroplasty retrieval lab

Dr. Mihalko is an orthopaedic surgeon in the Campbell Clinic and holds the Hyde Chair of Excellence in Rehabilitative Engineering in the UT Department of Orthopaedics and Biomedical Engineering. He spends 40% of his time in clinical practice at the Memphis Veterans Administration Hospital and 60% in research and administrating the joint program on the UT-campus. Dr. Mihalko is very active in leadership positions in the American Academy of Orthopaedic Surgeons and ASTM International, where he serves as an officer for F04 3800 (computer assisted surgical systems) and as the User-vice-chair for F04 medical devices. His current research interests align with his clinical practice as a hip and knee arthroplasty surgeon. These include a retrieval program he has developed for analyzing well-functioning long term implants obtained at time of necropsy. He also investigates biomarkers associated with early joint replacement failures. He works collaboratively with Dr. Audrey Zucker-Levin and Dr. John L. Williams in the gait analysis laboratory located in the UT Department of Physical Therapy.

For additional information, contact Dr. Bill Mihalko

BME FACULTY FOCUS: UoM-Campus

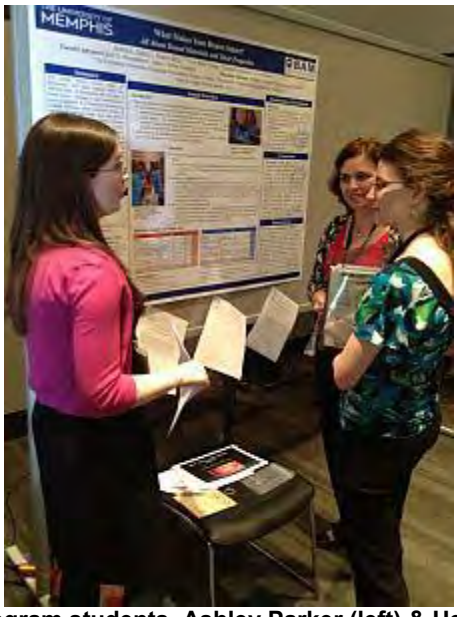
We welcome Dr. Gary L. Bowlin, Professor and Herff Chair of Excellence in Biomedical Engineering. Dr. Bowlin joined the University of Memphis and the Joint Program after an extensive search in August 2013. Dr. Bowlin has B.S. and M.S. degrees in Chemical Engineering, and a PhD in

Dr. Gary L. Bowlin, Herff Chair of Excellence and Director of the Tissue Engineering Laboratory

Biomedical Engineering (The University of Akron in 1996). Dr. Bowlin has 16+ years of teaching and research experience in electrospinning, biomaterials, and tissue engineering with focus on the development of electrospun tissue engineering scaffolds and products for use in dental reconstruction, bone regeneration, cartilage repair, vascular surgery, wound healing, hemostasis (controlling voluminous bleeding) and delivery of biological factors. He holds 9 U.S. patents in the area of electrospinning/tissue scaffold technologies. He is the co-founding inventor of four companies: NanoMatrix, Inc., TraumaCure, Inc., St. Teresa Medical, Inc., and St. Francis Veterinary Medical, Inc. Recently he was elected as a Fellow of the American Institute of Medical and Biological Engineering.

For additional information, contact Dr. Gary Bowlin

STUDENT/CHAPTER NEWS



Jt Program students, Ashley Parker (left) & Heather Doty (far right) presenting to judge (middle) at the Society for Biomaterials Student Competition, Boston, MA April 2013

This past spring, the student club participated in the 1st Society for Biomaterials Student Design Competition. The competition was to develop a learning module on a biomaterials topic for middle school science classes. The team, led by PhD grad students, Ashley Parker and Heather Doty, won 4th place ($500) for their module on super-elasticity and shape memory properties of NiTi alloy wires used in orthodontic braces. The students have delivered the module to several local middle school science classes, girl scout meetings and the UoM's Girls Experiencing Engineering summer camps. For additional information, click here.

New Student Club Officers are: Lauren Eichaker (PhD Candidate, Hasty Lab), Alex Hoban (MS candidate, Haggard Lab). If you are in the area, the student club would love to have you come and talk to the students and/or to help with ideas for club projects and/or participating in design competitions and meetings.

BME STUDENT FOCUS: UTHSC-CAMPUS

Graduate students Erik Woodard (left) and Casey Herbert (right) in Dr. Mihalko's Lab

Graduate students, Erik Woodard majored in BME at Louisiana Tech University and Casey Herbert majored in ME at Gonzaga University. Both have had a strong interest in mechanics and in applying engineering techniques and research to medical problems. For Erik, he wanted to further develop his biomechanics experience and education in clinically oriented research before entering into the biomedical industry. Casey wanted to focus his mechanics background into a biomechanics career as well as to stretch his wings and see another part of the country. Their interest led them to the Joint Program and to Dr. Mihalko's lab. Both have been thrilled with the diversity of projects and activities that they have been exposed to, from assessing knee replacement components by micoCT, evaluating cadaveric specimens using a motion tracking

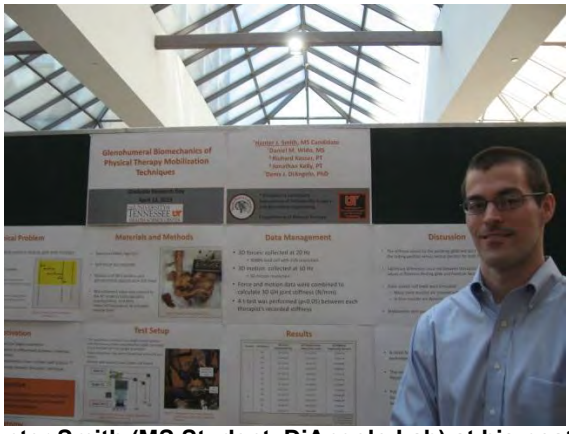
system to working with residents to determine optimal placement of total joint devices. Erik also spent a summer at Drexel University perfoming tribiology and volumetric wear measurements of retrieved devices. Both have presented results at national and regional conferences. Erik wants to finish his MS and pursue a career in orthopedic industry where he can continue to interact with clinicians, researchers and implant designers. Casey wants to pursue his PhD and then work in industry to improve instrumentation of testing and analyses for biomechanical analyses.

BME STUDENT FOCUS: UoM CAMPUS

BME student inventors and entrepreneurs; Carlos Oritz (L) and Marsalas Whitaker (R), co-founders of AIS Inc, a minimally invasive and leadless cardiac defibrillator device company.

Undergraduate students, Carlos Ortiz and Marsalas Whitaker co-founded Asclepius Innovative Solutions (AIS Inc. for short), a company focused on developing a minimally invasive, leadless cardiac defibrillator aimed at pediatric patients. They called their device the Guardian. Based on their design concept, AIS was selected as one of six start-ups for the 2013 ZeroTo510 Medical Device Accelerator program. The program is organized by the Memphis Bioworks Foundation with support from Innova Memphis and MB Venture Partners, Memphis-based venture capital firms. Dr. Amy Curry worked with the students as a technical consultant. Marsalas is back in school this fall complete his degree and Carlos is continuing to develop the design and moving the company forward.

CELEBRATE THE VICTORIES



Hunter Smith (MS Student, DiAngelo Lab) at his poster presentation at the 2013 UTHSC Research Day.

- Graduate students Erik Woodard & Casey Hebert (Mihalko lab) gave 3 presentations at 2013 International Society for Technology in Arthroplasty, Palm Beach FL.
- Dr. Mihalko's paper *"Biomechanical validation of medial pie crusting for soft tissue balancing in TKA"* is nominated for an award by The Knee Society. Co-authors include graduate students Erik Woodard, and Casey Hebert, and faculty J Crockarell (Campbell Clinic), and JL Williams.
- Hunter Smith's (DiAngelo Lab) presentation on shoulder mechanics won 1st Place at the 2013 UTHSC Graduate Research Day.
- Brooke Sanford (PhD '13) won the Springer Best Paper Award at the 16th International Conference on Medical Image Computing and Computer Assisted Intervention Computational Biomechanics for Medicine Workshop VIII, Nagoya, Japan, Sept 2013 for paper "*Hip, knee and ankle joint forces in healthy weight, overweight and obese individuals during walking,*" Co-authors were JL Williams, AR Zucker-Levin, and WM Mihalko.
- Gregg Kisiel and Alex Maclin, (Lindner Lab) won 1st and 2nd place for graduate presentations at UoM 2013 Research Day.

Alex Maclin at right (PhD, Lindner Lab) receiving award at 2013 UoM Research Day from UoM Provost.

- Hummad Tasneem (Roan Lab) and Monica Rawson (Jennings Lab) won 1st and 2nd place for undergraduate presentations at UoM 2013 Research Day.
- Ashley Parker (Haggard Lab) was keynote speaker at UoM 2013 Research Day.
- Spring/Summer Graduations: 3 PhD's, 5 MS degrees and 12 BS degrees.

ALUMNI

We look forward to staying connected to our alumni and friends. Please update your alumni information and/or send us news/events that you would like to share. Please visit uthscalumni.com or www.memphis.edu/alumni to support the Joint Program Departments.

Faculty member Joel Bumgardner with Egleide Elenes (BS '09; MS '10) *[top]* and Faculty member Gene Eckstein with Gary Bledsoe (MS '95; PhD '99) *[bottom]* at the BMES Annual Meeting, Seattle WA, Sept 2013.

Left to right: Gregg Keisel (PhD candidate; Lindner Lab), Marvin Mecwan (BS '10; MS '11), Grace Waters (BS candidate '14) and James Sheppard (PhD candidate Lindner lab) at the BMES Annual Meeting, Seattle WA, Sept 2013.