

Spring 2008

BME STATS Spring/Summer 2008

Department of Biomedical Engineering, Florida International University

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Recommended Citation

Department of Biomedical Engineering, Florida International University, "BME STATS Spring/Summer 2008" (2008). *STATS*. 8.
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Message from the Chair



This year has been one of change for Florida International University's Biomedical Engineering Department. Our founding chair, Richard Schoephoerster, left to become Dean of Engineering at the University of Texas at El Paso. It was a loss for FIU but a gain for UTEP. We wish him success in his new mission.

Richard leaves behind a thriving department. It started in 1999, the year I joined FIU, with only MS and undergraduate minor programs. We added the BS in 2002, became a department in 2003, and added the PhD program in 2004. Our growth and success in such a short time was only possible due to the innovative path we took. The efforts were rewarded in 2001 by the \$5 million endowment from the Wallace H. Coulter Foundation that was matched with \$5 million from the state and later a \$1 million gift from the Ware Foundation.

We continue to build strong academic and research programs at FIU. Our graduate program is growing as our PhD program matures and produces graduates. We currently have 25 students in the PhD program and 2 graduates. Our undergraduate program now has 77 graduates, 30 graduates just this year. We started a chapter of the Alpha Eta Mu Beta Biomedical Engineering Honor Society to complement the established and very active BMES chapter. We received more than \$5.4 million in research awards over the past three years. This year we hosted the Enterprise Development Corporation's Life Science Conference on campus.

We look forward to the growth of FIU's new College of Medicine and the collaborations that will develop.

Dr. Anthony McGowan

News: FIU College of Medicine receives preliminary accreditation

In February 2008, Florida International University's College of Medicine announced that it had received preliminary accreditation from the Liaison Committee on Medical Education (LCME), allowing the school to accept its first class of future doctors in the fall of 2009. The Biomedical Engineering Department is looking forward to working very closely with the College of Medicine and Dr. Joe Leigh Simpson, BME Coulter Distinguished Professor in Bioinstrumentation and Biomeasurement.

Enterprise Development Corporation's 7th Annual Life Science Conference



Several prominent leaders in the medical and technology fields graced FIU's campus during Enterprise Development Corporation's annual Life Science Conference April 24, 2008 hosted by the Biomedical Engineering Department. Using the theme "Leveraging Information Technology to Meet Today's Healthcare Challenges," the conference brought more than 300 industry leaders together to explore how information technology meets today's healthcare challenges and also to bring South Florida's Life Science community together for meaningful collaboration.

Discussion topics included:

- Improved medical billing, records retention and other healthcare services
- Underlying technology platforms that drive the healthcare industry
- South Florida's pipeline of emerging technologies

The following BME graduate students presented abstracts and posters:

- Brain Activation Map Analysis in Multi-Site Data Repository for Pediatric Epilepsy, Magno R. Guillen
- Nanomaterials Functionalized Device for Redox Studies of Cytochrome P450cam L244K, Avani Mulchandani
- Development of Cell Impedance Based Sensing System for the Nanotoxicity Assay, Evangelina Hondroulis
- A Novel Handheld Based Optical Imager Toward Diagnostic Breast Imaging, Steven Regalado
- An Inter-Patient Analysis for Seizure Detection, Maria T. Tito
- Optical Diagnosis of Ischemia-Induced Myocardial Injuries in Vivo, Yalin Ti
- Application of the Principal Component Analysis to Brain Activation Maps in Pediatric Epilepsy, Xiaozhen You

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Biomedical Engineering Society

Message from the President

>> **Luis Alonso**



The Biomedical Engineering Society (BMES) plays a relevant role in enhancing the academic and social careers of its members at Florida International University. Our goal is to inform and expose our members to what the profession of Biomedical Engineering entails and the role of a biomedical engineer in society. With the 2005 Accreditation Board for Engineering and Technology (ABET) accreditation received by the department, it has become increasingly important for us to keep our members active and aware of the expectations placed on them as Biomedical Engineering graduates.

This year BMES continued its commitment to expose our members to research and employment opportunities. With the generous support of two local biomedical companies-Scion Cardio-Vascular and Oxylation, LLC-our students were yet again represented at the 2007 BMES National Conference in Los Angeles. Our members accepted a volunteering opportunity at the International Symposium on Endovascular Therapy (ISET) Conference and learned about the role of biomedical engineers in the field. Our collaboration with different organizations around FIU has allowed us to organize a plethora of events including club fairs, academic fairs, social events, leadership seminars and research seminars. One event to highlight was the faculty versus students' softball game hosted at the FIU campus. This successful event allowed BMES members to interact with their professors in a more personal environment. I am proud to announce that after a four-year losing streak, the students are victorious once again!

All these great accomplishments could not have been achieved without the work of many people. Therefore, I would like to thank all of the members and executive board members who helped BMES become one of the leading organizations in the engineering center.

2007-2008 Executive Board Members: M. Cristina Ramirez (vice-president); Lizeth Caldera (executive secretary); Paula Sossa (treasurer); Vanessa Scagliati (events coordinator); Ali Reza Shams (social chair); Genevieve Knowles (marketing coordinator); Liset Hilares (undergraduate student representative), and Maggy Seiglie (webmaster/historian)

Most active members: Sarah Boodram, Lorena Suarez and Jennifer Soto

BMES and the Biomedical Engineering Department have been following a great path of growth and success. It is my hope that the future members of this outstanding society keep the legacy alive for years to come.

Alpha Eta Mu Beta Biomedical Engineering Honor Society: Message from the President

>> **Andres Ramos**



Alpha Eta Mu Beta (AEMB), a Biomedical Engineering Honor Society, was founded by Dr. Daniel Reneau at Louisiana Tech University in 1979, under the sponsorship of the Alliance for Engineering in Medicine and Biology. Membership to AEMB is by invitation only and is offered to the top fifth of juniors and top third of seniors who have completed at least six semester credit hours of biomedical engineering courses. For graduate students, membership requires the completion of six credit hours (MS) or 12 credit hours (PhD) and a ranking in the top one-third of the class or a 3.75 GPA, whichever is higher.

Thanks to the efforts and help of our former chair, Dr. Richard Schoephoerster, and our chapter advisor, Dr. Anthony McGoron, the FIU chapter was founded in 2007. There were only 10 members in the charter-nine undergraduates and one graduate. The founding ideals of our chapter were to provide a way to recognize those who excelled academically, but also to encourage our members to give back to the community, FIU and the BME department.

We are proud to say that our average GPA is 3.627. However, we would like our members to be well-rounded individuals and we believe that personal and professional involvement is as important as academic success. In the past year, we have inducted 31 new members, organized several events such as can drives and bake sales, and we have participated in school activities

including the Honors Council Brain Bowl, in which we competed with student teams from other disciplines. We have also been active in community service events such as Relay for Life.

We have lots of exciting plans for upcoming semesters, such as a member retreat, a journal club to keep up with the latest research developments, and a mentoring/tutoring program to help other students in the Biomedical Engineering department succeed with their class work.

Charter Members of AEMB include Roxana Ordonez, President; Alicia Fernandez-Fernandez, Vice President; Andres Ramos, Secretary; Yojans Lurbe, Treasurer; Ali Shams, HC Representative; and Anthony J. McGoron, Ph.D., Faculty Advisor.

If you are invited next semester, join us! We want to build a stronger society that our department can be proud of. You can contact us at aemb.fiu@gmail.com or check out our website at <http://web.eng.fiu.edu/aemb/>.

2008 Board Members:

Andres Ramos, *President*

Alicia Fernandez-Fernandez, *Vice President*

Jose Matteo, *Secretary*

Rupak Dua, *Treasurer*

Joe Soto, *HC Representative*

Gisela Gonzalez, *Events Coordinator*

STUDENT SPOTLIGHT

>> **Siobhain Gallocher**



heart valve. Siobhain completed her undergraduate degree in Summer 2002 and received the Outstanding Graduate in Chemical Engineering award.

Her work with the project's initial prototypes and feasibility testing had her hooked. Siobhain decided to continue her graduate studies in Biomedical Engineering, focusing her thesis on the assessment of the thrombogenicity of the heart valve. She earned her master's degree in Spring 2004-along with the Outstanding Master's Graduate award-and again decided to continue her education at FIU in the Biomedical Engineering PhD program.

"I chose to continue my education because the heart valve project was a collaborative effort between Innovia, LLC and the department. I realized that by staying involved in the project, I would have the opportunity to work, at least part

Siobhain Gallocher is a true product of the Department of Biomedical Engineering. Not only did she receive all three degrees and a wealth of research and career development opportunities, but she also met her husband, Marcus Lowe, a BME alumnus, within the halls of the Engineering building.

Siobhain came to Florida International University as a transfer student in January 2000. During her undergraduate studies, she secured a position as a research assistant in the Cardiovascular Engineering Center under the mentorship of Dr. Richard Schoephoerster, where she became involved in the design and development of an artificial polymer trileaflet

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2008 Biomedical Engineering Technology Expo & Competition



FIRST PLACE AWARD: Team members Francisco Delgado, Rosa Ramirez, Liza Gordillo and Patricia Brooks with their sponsor Dr. Pieter Hommen from Mercy Hospital.



SECOND PLACE AWARD: Team members Adrian Romero, Jose Villar and Teresa Reverte with Dr. McGoron, Biomedical Engineering Department Chair.

The Spring session of the 2008 Biomedical Engineering Technology Expo & Competition was held on April 17, 2008 at the Engineering Center. This competition is a required curricular activity for undergraduate Biomedical Engineering seniors. Student teams presented their senior design projects that created and/or investigated solutions to unmet clinical needs. The presentations were made to a panel of judges comprising members of the BME advisory board, which represents academia, industry and clinical medicine. In addition to providing a venue for students to display the products of their efforts, the event offered biomedical companies and entrepreneurs a view of FIU's graduating biomedical engineers and innovative biomedical technology. During this session, seven teams competed in what is our largest competition to date. Team members

Francisco Delgado, Rosa Ramirez, Liza Gordillo and Patricia Brooks won first place for their "Instrument for Rotator Cuff Tendon Repair" project. The team received a \$750 scholarship award.

Second place honors went to team members Adrian Romero, Jose Villar and Teresa Reverte for their "Multi-Modal Spectral Imaging System" project. The team received a \$250 scholarship award.

Serving as distinguished judges for the competition were Carla Fleszczynski, Technical Operations Engineer, Beckman Coulter, Inc.; Ann Beal Salamone, President of Rochal Industries; Hamid Shahrestani, President/CEO of Qualtech Solutions, Inc.; and Jonathan Sussman, Associate Director of Research Programs at FIU's College of Engineering and Computing.

Opportunities for Students

Biomedical Engineering Undergraduate Excellence Scholarships

The Biomedical Engineering Department offers several merit-based scholarships of \$5,000 to deserving undergraduates. Eligibility criteria require students to maintain a 3.0 GPA and declare/intend Biomedical Engineering as a major field of study. To learn more about the Biomedical Engineering Undergraduate Excellence Scholarships, visit www.bme.fiu.edu or contact us at 305-348-6950. Congratulations to the following students who were awarded the Excellence Scholarship starting Fall 2008: Miguel M. Libera; Deidre Campbell; Jose Luis Alvarez; Ana I Pena; Jerry Centeno and Kanwal F. Raja.

Norman R. Weldon Summer Research Internship

The FIU Biomedical Engineering Department presents awards for undergraduate students

to participate in faculty research during the summer. The awards are intended to support students with an interest in pursuing a career in research with plans to pursue graduate studies in Biomedical Engineering. Two students are selected to conduct research in a faculty's laboratory for 20 hours each week for 12 weeks over the summer (May-August). The students are required to prepare a three-page proposal to demonstrate that the resources (facilities, equipment and materials) are available for the research. Applications are reviewed and assessed according to the following criteria: (1) student's academic achievements (grades); (2) student's history of participation in department activities (Biomedical Engineering Society); (3) the scientific proposal; (4) availability of adequate resources; and (5) mentor's letter. At the end of the summer, the students will provide a final report and give a presentation at a student

FACULTY FOCUS

>> Dr. Michael Christie



Dr. Michael Christie is the newest faculty member to join the Biomedical Engineering Department at Florida International University. A native of New Jersey, Dr. Christie attended Rutgers University where he earned a BS in Mechanical Engineering and subsequently an MS and PhD in Materials Science and Engineering, with specialization in the research and development of electroactive polymer sensors for non-invasive imaging applications.

After completing his graduate studies, Dr. Christie joined Johnson & Johnson, where he worked in areas of increasing responsibility. Among his award-winning accomplishments was the establishment of a new facility for drug analysis and assay development. He was also responsible for all analytical testing for the \$2 billion per year Gypher-drug-coated stent program encompassing R&D, product development and FDA approval processes. He later established Millennium Scientific Inc., a Parkland, FL-based materials and quality consulting firm, where he worked as principal scientist prior to joining the Biomedical Engineering Department.

Dr. Christie said he is humbled by the appointment as an Instructor and Undergraduate Advisor. "Having worked as an adjunct and visiting professor in the department since 2005, I am happy that my commitment to students, the department, and the college as a whole has been validated by my colleagues and the college administration."

In addition to teaching two undergraduate and one graduate course, Dr. Christie makes time for advising students on academic as well as career matters. He is also involved in establishing an undergraduate research initiative to study the hemodynamics of sickle cell anemia and other circulatory diseases and conditions including diabetes and hypertension.

When not involved with his work, Dr. Christie enjoys a day out with his wife, Heather, and children Michael Jr. and Michala. He admits that he has a hard time turning down an offer for a few sets of tennis or a pick-up game of soccer.

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BME Awards 2007-2008



Anthony J. McGoron, Associate Professor and Acting Chair, received an INNOVIA, LLC - FIU Foundation award in the amount of \$15,000 to support the study of Biocompatibility Evaluation of Composite Polymeric Materials. He also received a Faculty Research Award for \$23,000 from the FIU Foundation to work on Image

Guided Targeted Therapeutics for Cancer: Experimental Protocol Development. The Larry Foundation awarded him \$10,000 to continue support of the Bubble Oxygenator project. The Arthritis Research Foundation gave \$3,000 to support the Implant Retrieval Research.



Anuradha Godavarty, Ph.D. Assistant Professor, received an award in the amount of \$196,640 from the National Institute of Health to work on A Novel Hand-Held Based Optical Imager for Fluorescence Imaging of Breast Cancer. Under this award she is developing a handheld-based imaging device for breast cancer diagnostics using

the non-invasive and non-ionizing near-infrared light rather than harmful x-rays. She also received an award in the amount of \$52,500 from the Florida Department of Health to work on a Hand-held Optical Probe for fluorescence imaging of breast cancer.



Wei-Chiang Lin, Miami Children's Hospital Assistant Professor of Neuro Engineering, recently received his tenure and promotion. Dr. Lin received an award in the amount of \$320,214 from the Thrasher Research Fund to work on Optimizing Pediatric Brain Tumor Surgery through Optical Spectroscopy to Enhance

Survival and Quality of Life. The arrangement between FIU and Miami Children's Hospital has been a very successful and the BME department looks forward to building on that success.



Malek Adjouadi, Professor, Joint Appointment, was honored by FIU President Modesto Maidique on April 2nd 2008 as a distinguished faculty member for his outstanding accomplishments in research and scholarship. In addition, Adjouadi has received \$16,276 from Children's Memorial Hospital; \$87,000 from the and \$661,656 from the National Science

Ware Foundation, Foundation.



Nikolaos Tsoukias, Ph.D. Assistant Professor, received a \$1 million award in June 2008 from the National Institute of Health to study microcirculatory function in hypertension. The title of this project is Theoretical and Experimental Investigations of Microcirculatory Signaling. He previously received a Faculty

Research Award in the amount of \$22,500 to work on In Vitro Models to Investigate Microcirculatory NO-Ca²⁺



Chenzhong Li, Assistant Professor, received an award of \$186,153 from the U.S. Air Force Office of Scientific Research to work on Biosensing Approaches for the Evaluation of Toxicity of Nanomaterials.

BME 2008 Lecture Series

Supported by the Coulter Foundation

The following is a partial list of the lectures that took place in 2008, presented by guest speakers.

Jan. 30, 2008	Hemodynamics of Sickle Cell Anemia with Varying Parameters
Feb. 6, 2008	Heart Rate Variability for Risk Stratification of Patients with Cardiovascular Disease
Feb. 18, 2008	Why There Is No HIV-1 Vaccine Yet? What is the Nature of Molecular Defenses That Are at Work Against HIV-1?
Feb. 27, 2008	Role of Mechanical Force and Scaffold in Stem Cell-Base Cartilage Tissue Engineering
Mar. 4, 2008	Photonic Bioengineering for Translational applications in Biology, Medicine and Surgery
Mar. 5, 2008	Translational Nanomedicine: Clinical Approaches
May 12, 2008	Micro-fabricated Platforms for stem cell research
May 13, 2008	Tissue and Stress Variability in Vertebral Bone
May 14, 2008	Adult Stem Cell-based Craniofacial Tissue Engineering
May 15, 2008	Tissue Engineering of Skeletal and Cardiac Muscles

STUDENT SPOTLIGHT *continued from page 2*

departmental activities, so I jumped at the opportunity to act as Secretary of the BMES in the year the student chapter was founded," said Siobhain, who later became the Society's President.

In Summer 2008, Siobhain began teaching in the department, overseeing the Data Evaluation Principles course. "I have a vested interest in the future of this department, and it is because of this that I have welcomed the opportunity to teach and give back to an institution that has given me so much," she said. She is now working as an engineer in Product Development at SafeStitch Medical, Inc.

Opportunities for Students *continued from page 3*

BMES chapter meeting. These awards are intended for students at the late junior or early senior level. For more information on the Norman R. Weldon Summer Research Internship call us at 305-348-6950. Congratulations to the winners for Summer 2008: Manuel Salinas and Denny Carvajal. Manuel's mentor is Dr. Christie and the title of his project is Rheological Behavior of Red Blood Cells and Simulation of blood flow in humans afflicted with various circulatory diseases. Denny's mentor is Dr. McGoron and the title of his project is Proving the Statistical Significance of a Developing Multiple Indicator Dilution technique using fluorescent dyes to measure cardiac capillary permeability.

Nominations for Outstanding Undergraduate Award

Of the 20 students who graduated from the BME department in Spring 2008, seven were eligible for the Outstanding Student award. After careful consideration of the two strongest candidates, BME faculty chose Adel Said Elsayed as recipient of the Spring 2008 Outstanding Undergraduate Award. The Fall 2007 recipient was Vivian Sueiras.

Biomedical Engineering STATS

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Biomedical Engineering STATS, the Newsletter of the Department of Biomedical Engineering, is published annually.

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