

Winter 2006

BME STATS Winter 2006

Department of Biomedical Engineering, Florida International University

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**Message from
the Chair**



The state of Florida has clearly made the biomedical industry a prime agent in its plan for economic development statewide. Investments by the state to 1) attract biomedical research organizations like the Scripps Research Institute, the Burnham Institute for Medical Research, and now possibly the Wistar Institute (all 3 receive significant funding from the NIH) to house facilities in Florida, 2) establish the King Biomedical Research and the Bankhead-Coley Cancer Research Programs to fund biomedical research at Florida institutions, and 3) approve two new medical schools at FIU and UCF, are likely to position Florida as a major player in the biomedical industry.

Universities contribute to the advancement of the biomedical industry through professional workforce development, and new technologies based on our research. FIU has taken significant steps forward on both regards.

FIU now has the only accredited, public bachelor's degree program in biomedical engineering in the Florida. Through our Biomedical Engineering Partnership Program, our clinical and industry partners provided the initial design, and continue to mold the shape of this program to suit their needs. Our graduates are now being hired by industry and are becoming a major part of its professional workforce.

Our research is already making an impact on the products being developed by local companies such as Innovia LLC and Bioheart Inc. Increasing our research capacity to broaden our support of the biomedical industry will be primary among our upcoming activities. The establishment of the new College of Medicine will significantly contribute to the further development of our research programs. In the next issue of our newsletter we will have much more to say about the state of research at FIU BME.

*Dr. Richard T. Schoephoerster,
Professor and Wallace H. Coulter Chair*

BME Program Receives Accreditation

The Department of Biomedical Engineering is proud to announce that its Baccalaureate program has been accredited by the Engineering Accreditation Commission of ABET, Inc., the recognized accreditor of college and university programs in applied science, computing, engineering, and technology. ABET accreditation demonstrates a program's commitment to providing its students with a quality education. The Accreditation is retroactive to 2004, when the BME program graduated its first group of students.

our program. Our program has always opened doors for our graduates. With accreditation, it just became easier."

A key element of ABET accreditation is the requirement that programs continuously improve the quality of education provided. As part of this requirement, programs set specific, measurable goals for their students and graduates, assess their success at reaching those goals, and improve their programs based on the results of their assessment.

"This is great news for our students: past, present, and future," says Department Chair Richard Schoephoerster. "We are committed to delivering a quality education, and continuous improvement of

Accreditation is a voluntary, peer-review process that requires programs to undergo comprehensive, periodic evaluations. The evaluations, conducted by teams of volunteer professionals working in

continued on page 4

College of Medicine Becoming a Reality



*FIU College of Medicine
Dean John Rock*

FIU continues to grow, creating positive ripple effects that will be felt far and wide, inside and outside of the South Florida community.

In March, the Florida Board of Governors voted to create a College of Medicine at FIU, a decision that will bring South Floridians new educational and employment opportunities, in addition to better access to healthcare. Dr. John Rock began his appointment in January as FIU College of Medicine founding dean and executive vice president for medical affairs.

2002-2003, "...biomedical engineering graduates have the highest admission rate to medical school of all majors." Having a medical school within the University will offer a potentially continuous educational track for FIU students and it will strengthen and expand the partnerships that the Department has already established with local hospitals and industry. Integral in the relationship with the College

continued on page 4

Inside This Issue

- BME Program Receives Accreditation
- College of Medicine Becoming a Reality
- Biomedical Engineering Society
- Message from the President
- Alumni Edge – John Ramirez
- Student Spotlight – Haroldo Silvia
- Topics in Student Research - Professor Wei-Chiang Lin
- Faculty Focus - Dr. Anuradha Godavarty
- BME Awards
- New Faculty

Biomedical Engineering Society

Message from the President

>> **Juan P. Rojas**



The Florida International University Chapter of the Biomedical Engineering Society has started the 2006 – 2007 term with a new executive board of enthusiastic and devoted students. The elections held in April and September resulted in Adel Said Alsayed as our Vice President, Roxana Ordonez the new Executive Secretary, Rosa Ramirez was elected Treasurer, Sara Nofallah and Liset Hilares are our Graduate and Undergraduate Student Representatives, respectively, Hector Roos is our Events Coordinator, Paula Sossa the Marketing Coordinator, Maria Jiron as the Public Relations Officer, and Christopher Gustine continues his role as Webmaster with Julian Currea as his intern. In addition to the existing positions being successfully filled, new positions were opened to expand and organize the society. Cecilia Flores was elected the Social Chair for the society and Lizeth Caldera our Historian.

The new executive board is committed to the continuing growth and fortification of our society. We are working on developing new projects with the purpose of benefiting the students and making them more active within the society. Some of these projects include tutoring, and the mediation of textbook sales with which we also intend to demonstrate our commitment to the students.

The Biomedical Engineering Society continues to participate in events that allow the students to appreciate the role of Biomedical Engineers in industry and society. This year the chapter will be represented again at the BMES Conference which will be held in Chicago. We look forward to being awarded the Fleetest Feet Award for the third consecutive year. This award is given to the Chapter that takes the most members for the most miles to the conference. We are also looking forward to competing for the national Chapter Meritorious Achievement Award in 2007. In addition, we will continue to participate in the ISET seminar, Biotec, and the Bioengineering Conference later in Spring 2007.

We are proud to continue the work of our precursors, with the hopes of making the Biomedical Engineering Society the best it can be. The society is here because of the students and for the students.

ALUMNI EDGE

>> **John Ramirez, MS '04**



John Ramirez is most definitely an over achiever. He earned a BS in Electrical Engineering, followed by an MS in Biomedical Engineering while simultaneously holding a full time position at Baptist Hospital, first in the cardiovascular division, then in radiology. He also happened to be married and raising a child. But there was a practical reason for such a demanding regimen - making the most of opportunities that allowed him to gain experience and explore different career options. "I believe that working in a hospital setting helped to cement my dream of entering an up and coming field – Biomedical Engineering," he says.

While at FIU, Ramirez helped to facilitate the biomedical clinical rotation course, he participated in interactive class discussions and hands-on learning exercises, and honed a variety of skills that serve him to this day. He has even been surprised to find that courses he never imagined would have field applications have helped him succeed as a Patent Examiner in the Medical Arts (Diagnostic

Imaging) at the United States Patent and Trademark Office (USPTO). "FIU's curriculum has been developed with great precision. It is designed to prepare students to be highly skilled and knowledgeable," he explains.

Ever the pragmatist, Ramirez stresses the importance of practical working knowledge to FIU students and that they consider looking into a career at the USPTO. "There are programs that are unique to the federal government workplace. You'll get to interact with experts in several disciplines and to explore opportunities that would enhance your skills."

A native of Colombia, South America, Ramirez spends considerable time working for the 2006 Combined Federal Campaign, through which international, national and local charities benefit. He and his wife, whom he praises as an invaluable key to his success, reside in northern Virginia and enjoy art, museums and American history.

STUDENT SPOTLIGHT

>> **Haroldo Silva, BS '05**



If you were to look up the meaning of "well rounded" in the dictionary, you just might find a picture of Haroldo Silva. He is a winner of the Outstanding BME graduate award, a McNair Scholar, enthusiastic participant in numerous honor and service organizations, and an intramural soccer player who also enjoys football and has tried rock climbing and repelling – suffice it to say, that list speaks for itself.

This fall, Silva began pursuing a Ph.D. in the bioengineering joint program at University of California San Francisco and University of California Berkeley through the Chancellor Fellowship for Graduate Study. Due to his extensive research experience at FIU, he wasn't required to complete a master's degree. He focused on computational and mathematical modeling of biological systems, primarily blood vessels, and recently submitted an article to the American Journal of Physiology – Cell Physiology. He also presented his research at the Biomedical and Comparative Immunology Symposium at FIU in 2006.

Silva feels that his time at FIU enriched his life and enabled him to follow a successful path to his graduate studies. As a member of the National Society of Collegiate Scholars, he traveled with 70 engineering students from across the U.S. for a 15-day trip to China. He also had opportunities to conduct independent research. He explains, "I worked in a research lab under the supervision of a great mentor (Dr. Tsoukias) and received support from the Ronald E. McNair program, which really boosted my research efforts. When trying to get into a Ph.D. program, previous research experience was quintessential in the application process." The McNair program assists undergraduate students who want to pursue a Ph.D.

Silva also believes that FIU's expansion can only benefit the students who choose to come here. "It can only be advantageous for any student to be part of an institution that is always striving to improve itself and grow," he says.

Silva is a native of Belem, Brazil and moved with his parents to the United States in 1999.

Topics in Student Research

>> Professor Wei-Chiang Lin

Dr. Wei-Chiang Lin is an assistant professor in the BME department, as well as the founder and director of the Biomedical Optics Laboratory (BMEO) at FIU and Miami Children's Hospital. He recognized his enthusiasm for biomedical engineering even before he finished high school.

"As a youngster, I found myself enjoying the rigorousness of engineering and was also mesmerized by the phenomena of living subjects, he says." Biomedical engineering provides him the opportunity to satisfy his interests in both areas.

While pursuing his bachelor's degree in biomedical engineering at Chun Yuan Christian University in Taiwan, Lin developed a strong interest in biomedical instrumentation design and development. He became an assistant engineer in the Power Electronics Laboratory at the Industrial Technology Research Institute, Taiwan, in 1989.

"Through this job, I acquired several important skills in electronic circuit design/analysis, and, more importantly, recognized my passion for research, he says."

Dr. Lin entered the graduate program in Biomedical Engineering at the University of Texas at Austin in 1991. He joined the Optics Lab and studied for his Ph.D. under Dr. A.J. Welch and Dr. Massoud Motamedi's supervision. After graduating, Dr. Lin received a postdoctoral fellowship from the W. M. Keck Free Electron Laser Center at Vanderbilt University, and started his research career. At Vanderbilt, he began to explore the feasibility of using optical spectroscopy for intraoperative tissue characterization and, hence, surgical guidance. This has since become the major research theme of his career.

At FIU, Dr. Lin's research focuses on studying in vivo intrinsic tissue characteristics, both normal and diseased ones, using optical technologies. He and his research team are developing optical apparatus for in vivo characterization and demarcation of myocardial infarction and pediatric neoplastic and epileptogenic brain lesions. Lin also spends time fostering future biomedical engineers.

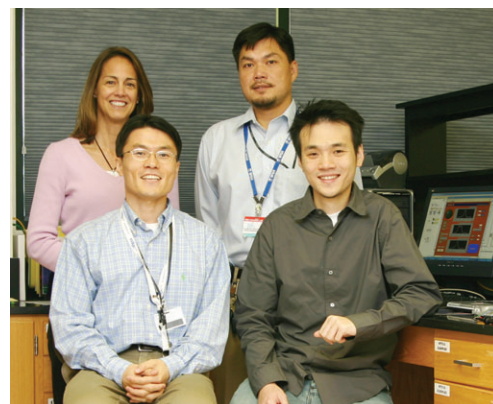
"Over the past few decades, we all have witnessed tremendous advances in various technologies and engineering," he observes. "However, our knowledge about the human body,



FOREFRONT FROM LEFT TO RIGHT: *Dr. Ernesto Coscarella, MD, and Dr. John Regheb, MD.* MISSING MEMBERS: *Yalin Ti, Alejandro Fernandez and Brad Fernald*

from normal physiology to disease development, is still limited. To bridge this gap, we need to get more youngsters involved in biomedical engineering and develop them into highly qualified biomedical engineers and researchers, so they can bring the latest and greatest technologies into the field of medicine and potentially solve the medical problems people continuously face each day."

Aside from biomedical engineering, Dr. Lin's other true passion is tennis. "These days, I find tennis is a great complement to my work because it allows me to relieve the mental stress accumulated from the research work," he explains.



TOP ROW (STANDING): *Ann McNeil, RN, Dr. Wei-Chiang Lin, PhD*
BOTTOM ROW (SITING): *Dr. Sanghoon Oh, PhD, Poching Chen*

FACULTY FOCUS

>> Dr. Anuradha Godavarty



Sure, the South Florida weather was welcomed bonus when Dr. Anuradha Godavarty, Assistant Professor, joined the BME department two years ago. But the BME department was still very young then and Dr. Godavarty's primary motivation was the opportunity to establish a new area for optical imaging, complementing the fields that already existed in the department. She has much to be proud of since her arrival.

Among the list of achievements are securing both industry and clinical collaborations. She has submitted for a provisional patent on an optical imaging instrumentation tool that would allow for non-invasive, comfortable mammography. Another application for the technology is brain mapping in children with epilepsy and autism. As satisfying as the science is in and of itself, Godavarty enthuses, "Helping people directly is more exciting."

Then there is her most important accomplishment, and her greatest source of joy: Godavarty and her husband, Dr. Arvind Agarwal, Assistant Professor in the Mechanical and Materials Engineering, have a one-year-old daughter Diya, to whom she devotes most of her personal time. "As an assistant professor in the early stage of my career, it is challenging," says Godavarty. "Life has definitely changed, but for good. It has made me more efficient at home and at work, having realized the priorities."

Godavarty's next professional goal is no less than to establish the first center for optical imaging in all of South Florida. It would offer multiple applications that directly impact people's health.

Dr. Godavarty is originally from Chennai, India. She earned her MS in Chemical Engineering at University of Tennessee, Knoxville, and her PhD in the same field at Texas A&M University. In what little spare time she has, she enjoys handicraft.

BME Awards 2006

Wei-Chiang Lin, *Assistant Professor of Biomedical Engineering*, won the Boucek Award from the Florida/Puerto Rico Affiliate of the American Heart Association. This award is given to the grant applicant with the highest scientific merit score of all grants awarded by the Affiliate. The grant received was in the amount of \$268,000 to study "In Vivo Differentiation of Normal, Stunned, Hibernating, and Scarred Myocardium Using Optical Spectroscopy".

Anthony McGoron, *Associate Professor of Biomedical Engineering*, received an AREA award from the National Institutes of Health in the amount of \$202,371 to study "Respiratory Motion Compensation in PET Molecular Imaging."

Armando Barreto (PI) and **Malek Adjouadi** (Co-PI), *Associate Professors of Biomedical and Electrical & Computer Engineering*, received \$349,460 from the NSF MRI Program for the "Development of a Highly Integrated Instrumentation Setup for Affective Sensing Research."

Malek Adjouadi also teamed with investigators from the University of Texas, El Paso, California State University, Dominguez Hills, New Mexico State University, and the University of Puerto Rico, Mayaguez, on a winning proposal in the amount of \$2,000,000 from the NSF BPC Alliance Program to develop a "Computing Alliance for Hispanic-Serving Institutions."

Anuradha Godavarty, *Assistant Professor of Biomedical Engineering*, received \$37,019 from Imaging Diagnostic Systems, Inc., to work cooperatively with this local company to develop "Novel Breast Phantoms with Known Optical Properties."

Richard Schoephoerster, *Professor and Wallace H. Coulter Chair of Biomedical Engineering*, received \$104,543 from HeartWare, Inc., to perform "Hemocompatibility Testing of Polymers for the Driveline of the HeartWare Next Generation LVAD."

continued from page 1

BME Program Receives Accreditation

industry, government, academe, and private practice within the ABET disciplines, focus on program curricula, faculty, institutional support, and other important areas.

"The members of the BME faculty and staff, along with Associate Dean David Shen and the Dean's Office staff, deserve special congratulations for this wonderful achievement," says Executive Dean Vish Prasad. "Recognition is also due to the departments that contribute to the BME curriculum."



ABET is a not-for-profit organization, owned and operated by its more than 25 professional and technical member societies. An internationally respected organization with some 1,500 volunteers, ABET has set the higher-educational standards in its fields for nearly 75 years. More information about ABET, its member societies, and the evaluation criteria used to accredit programs can be found at www.abet.org.

New Faculty

>> **Dr. Chenzhong Li** Assistant Professor



Dr. Li joined the department in fall 2006. He received his Bachelor degree in Materials Engineering from Hebei Polytechnic University in China in 1986, followed by a Master in Applied Chemistry (Bioelectrochemistry) and a Ph.D. from Kumamoto University in Japan in 1997 and 2000, respectively.

Dr. Li served for one year as a post-doctoral research associate at the University of British Columbia and two years as a professional research associate at the University of Saskatchewan. Before joining FIU, he was an Assistant Research

Officer in the Nanobiotechnology/Biosensor Group of the Biotechnology Research Institute, National Research Council of Canada from 2004-06. Dr. Li has authored two book chapters and 15 journal publications, and has three patents pending. His research interests are in the field of nanobiotechnology, especially the development of nanomaterials based bionanosensors, and biomolecular nanoelectronics.

When not involved in his research work, Dr. Li practices Yoga, meditation, and Qigong. The art of Qigong consists primarily of meditation, relaxation, physical movement, mind-body integration, and breathing exercises.

continued from page 1

College of Medicine Becoming a Reality

of Medicine will be partnerships with area hospitals, which will help educate our medical students and provide graduates with residency opportunities.



The College of Medicine is expected to accept applications in 2008 and admit its first class in 2009. The first class of physicians could graduate by 2012.

Biomedical Engineering STATS

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