



School of Engineering

University of Alabama at Birmingham,
Department of Biomedical Engineering

Message from the Chair



Greetings alumni and friends of the UAB Department of Biomedical Engineering. As we begin the fall semester, it is my pleasure to share some of the recent news from the department. Our students have had another extraordinary year. In the graduate program, 9 students completed their Master's. Five are continuing on for their PhD, three found jobs in industry and one

is going to medical school. Three students completed their PhD: Elliot Bourgeois, Dina Halwani and John Zhang. Elliot has a post doc position in the Department of Neurology at University of Pennsylvania. Dina Halwani and John Zhang are deciding between post doc offers. The 23 bachelor's graduates last year was our largest graduating class to date. Eighteen of the 19 students who looked for a position were placed: 3 found jobs in industry, 7 are attending graduate school, 7 are going to a professional school (Medical, Dental, or Pharmacy) and 1 is enrolled in the US Naval Academy Officer Candidate School. Five BS graduates plan to attend

graduate or professional school in 2012.

The BME faculty continues to be productive. Some of our recent awards are featured in articles in this newsletter.

I invite you to read about these and other accomplishments. Shortly, we will have a BME Department page on LinkedIn. Check it out and keep in touch. Feel free to stop by for a visit and a tour next time you are on campus. I am always interested in talking to our alums and friends.

Best Regards,

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Dr. Ho-Wook Jun Receives NSF
Early Career Development Award

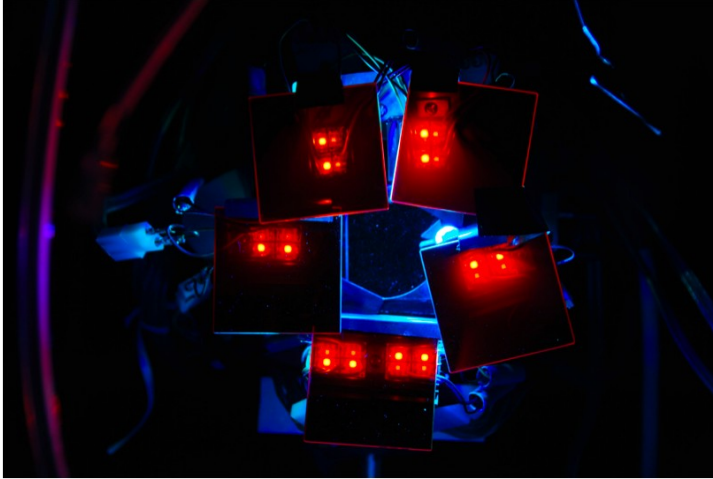
Dr. Ho-Wook Jun, Assistant Professor in the BME department, was recently awarded a Faculty Early Career Development (CAREER) Award from the National Science Foundation. "The main goal of my CAREER project is to develop a highly integrated research, education and outreach program around the development of bioactive hybrid nanomaterials for intervertebral disk (IVD) regeneration," explains Jun. "Low back pain is one of the leading causes of disability and mainly caused by IVD degeneration. Current therapies can ease the pain but are unable to completely restore normal function or promote new tissue regeneration. The proposed work is interdisciplinary and integrates nanotechnology, biomaterials science, stem cell biology, and tissue engineering. Thus, the work funded by the CAREER Award is transformative because it provides an innovative strategy to regenerate IVD by tackling the current challenges of electrospun nanofibers and self-assembled nanomaterials along with promoting multiple levels of education and outreach programs." The CAREER Award is NSF's most prestigious award in support of junior faculty teacher-scholars who have demonstrated commitment and



excellence in research and education.

Since joining the BME faculty in August 2006, Jun has excelled in both education and research. His work to develop biomimetic peptide-based biomaterials for tissue regeneration is highly innovative. He has received funding from The American Heart Association, The Juvenile Diabetes Foundation and the Wallace H. Coulter Foundation. His work is published in top journals including ACS Nano, Biomaterials, Biomacromolecules, Journal of Biomedical Materials Research, Nanomedicine: Nanotechnology, Biology and Medicine. In 2010 Jun received the UAB Graduate Dean's Award for Excellence in Mentorship for his exceptional accomplishments as a mentor of graduate and undergraduate students.

Jack Rogers Receives AHA Award to Study Cardiac Electrophysiology



Optical Equipment for Epifluorescent Cardiac Imaging

Research in Jack Rogers' lab involves an interplay between the development of new methods and instruments for studying cardiac physiology and the application of those methods to improve understanding and treatment of pathology. A recent focus is the use of optical methods to simultaneously track the mechanical deformation of the heart and the propagation of electrical wavefronts. One application of this technology is to understand why hearts sometimes fail to resume beating even after normal electrical activity is restored during resuscitation attempts.

To study this phenomenon, Dr. Rogers was recently awarded a two-year grant entitled "Simultaneous Mapping of Voltage, Calcium and Wall Motion during Post-shock Contractile Dysfunction" from the American Heart Association. The project will investigate the effects of ischemia, defibrillation shocks, and abnormal electrical activation on contractile function during resuscitation. In addition to the new American Heart Association funding, Dr. Rogers currently holds awards from the National Science Foundation and the National Institutes of Health.

Department of
Biomedical
Engineering
Newsletter

BME Graduate Student Travels to Poland for Research



Leigh Booth in Poland.

BME Master's Student Leigh Booth spent two weeks in Lodz, Poland as part of a NSF funded research collaboration between UAB and TU-Lodz. During the visit, Leigh was able to prepare a variety of nanostructured carbon coatings using some of the unique chemical vapor deposition systems in the Polish laboratory facilities. Leigh describes the experience as "a great research and educational opportunity. The group at TU-

Lodz does work that is closely related to the diamond coating research that we do in our facilities at UAB. Working in a collaborative research environment overseas has helped to broaden the scope of my

thesis research project and further enhance my own knowledge and understanding of this field." Currently, Leigh works in the Center for Nanoscale Materials and Biointegration with Dr. Yogesh Vohra and Dr. Shane Catledge on coating of titanium alloys with nanostructured diamond coatings to improve the wear resistance of biomedical implants. The NSF program supports internationally collaborative research in nanostructured carbon-based materials and provides advanced interdisciplinary training of students and young scientists. The group at TU-

Lodz does work that is closely related to the diamond coating research that we do in our facilities at UAB. "Working in a collaborative research environment overseas has helped to broaden the scope of my thesis research project and further enhance my own knowledge and understanding of this field." Leigh plans to complete her Masters degree requirements in summer 2011 and stay at UAB for her PhD.

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Focus: BME Graduate Alumni: LaTisha Salaam

LaTisha Salaam received her undergraduate degree at Tuskegee University, in Tuskegee Alabama, where she was a Distinguished Scholar Member of Omega Chi Epsilon and the President of the Tuskegee chapter of the American Institute of Chemical Engineers. She was also honored as the Chemical Engineering Student of the Year. During her summers, LaTisha interned at **3M Corporation** (St. Paul, MN) in the Medical Products Division, Packaging Systems Division, and Specialty Chemicals Division. She graduated Cum Laude with a **Bachelor of Science Degree** in Chemical Engineering from Tuskegee in **1998**.

LaTisha went on to study Biomedical Engineering at **the University of Alabama at Birmingham**. As a Graduate Research Assistant her research focused on development and characterization of synthetic biodegradable polymers for drug encapsulation and delivery, polymeric aggregation, kinet-

ics of protein crystal growth, and analytical material microscopy.

LaTisha received her **Master's Degree** in Biomedical Engineering in **2002** and her **Doctorate Degree** in Biomedical Engineering in **2005**. Prior to being awarded her doctoral degree, LaTisha was awarded a Frederick Douglass summer teaching fellowship, **teaching at the level of an Assistant Professor** for one year as part of a Pennsylvania State System of Higher Education Collaborative intended to commemorate Douglass' life-long contributions to equality and public service.

Her doctoral research "In Vitro Degradation Behavior of Biodegradable 4-Star Micelles" were published in 2006 in the journal *Polymer*.

After receiving her doctorate, Dr. Salaam moved to the Midwest to work for **Zimmer Inc., Warsaw, Indiana in 2005** where she focused on medical device prototyping, materials identification, screening and characteriza-

tion and development of sterilization methods.

In 2010, Dr. Salaam received her **Master's in Business Administration** degree from the University of Cincinnati. Also in 2010, LaTisha joined the BME External Advisory board.

Currently, Dr. Salaam works for **The Procter and Gamble Company** in the Family Care Division at the Charmin R&D Hubsite in Albany, GA as a **Senior Scientist/Engineer**. LaTisha leads a team responsible for product prototyping & methods development; product and process development and scale-up and intellectual property development.

Dr. Salaam has been granted 4 US/Global Patents with 5 patents pending. Most recently, LaTisha was appointed to the faculty of the Natural Science Department at Albany State University. Dr. Salaam is a native of Pittsview, AL. She was born the 2nd of four girls to Mr. & Mrs. David and Linda Salaam.

The BME External Advisory Board is comprised of distinguished leaders and alums from industry, academia and government. The EAB meets annually to provide feedback on our academic, research, outreach and other programs. LaTisha is one of the newest board members.

Focus: BME Undergraduate Alumni: Bryan Blakeney

Adam Blakeney just completing his senior year in Biomedical Engineering as an honor student in the department and with the University Honors Program. Over the years Adam has been an active in various community service projects, a leader in Tau Beta Pi Engineering Honor Society, and a student organizer for Gang Green, UAB's student spirit group

for UAB Blazer Athletics.

Adam has been a research assistant for Dr. Ho-Wook Jun in the department of BME for several years, and has co-authored a publication in *Biofabrication* with plans for other publications and presentations in the near future. Adam has won several awards, including the 2009 UAB Biomedical Engineering Undergraduate Student of

the Year, the 2009 School of Engineering Undergraduate Student of the Year as well as the 2009 Alabama Society of Professional Engineers Engineering Student of the Year. For graduate studies, Adam is planning to pursue an M.D./PhD degree. Adam is originally from Gulfport, Mississippi.



Adam Blakeney, UAB BSBME Graduate cheers at a Blazer Basketball game.



BME Grad Students Brittany Sowell, Jiajie Yan, Leigh Booth and Katie Culpepper tour BioHorizons in July 2010.

Biomedical Engineering Graduate Student (BMEGS) Organization

The Biomedical Engineering Graduate Student (BMEGS) Organization was developed from a shared interest among BME graduate students and faculty to provide graduate students greater voice in the BME graduate program. The BMEGS was conceived and developed by a number of graduate students in 2009 and became an officially recognized UAB student organization in November of that year. The purpose of BMEGS is to facilitate cohesive communication between BME graduate students and faculty members and allow opportunities for the students to be active in management and development of the Biomedical Engineering graduate program

through increased interdepartmental collaborations and external outreach programs. BMEGS is organized into committees for each of the organization's focus areas: professional development and networking, intramural/recreational sports, social activities, and community service/fundraising. The 2010-2011 BMEGS officers are: President – Greg Hoeker (ghoeker@uab.edu); Vice President – Joel Anderson (joela@uab.edu); Secretary – Katie Culpepper (bkc38@uab.edu) and Treasurer – David Johnson (dhj@uab.edu).

BMEGS is active in graduate student recruitment and new grad student orientation.

Their leadership and involvement in these activities have increased success in recruiting the best students into BME. Professional development activities include a BMEGS-run graduate student summer seminar series, tours of local biotechnology companies and hosting several seminar and department visitors. Ongoing projects within BMEGS include creating a curriculum for a new BioDesign course, developing an alumni network, and volunteering with Habitat for Humanity and local food shelters. BMEGS also fields competitive softball and soccer teams that compete in the UAB intramural sports program.

“The BMEGS provides an important student voice for the BME graduate program ”

Timothy Wick, BME Chair



Rajiv Menon, BME PhD 2010 (second from left), receives a Young Investigator Award for his presentation at the Frontiers of Biomedical Imaging Science Meeting (June 2009)

Giving to BME

As faculty and staff strive to provide quality education, research and experiential learning opportunities for students, we often require resources that are not available through tuition, research grants and contracts. We need your support to continue our growth, to expand the educational opportunities for students and improve the reputation of the BME Department. For example, we need additional resources to recruit and support graduate students; particularly for new

faculty hires or for new research directions where extramural grants and contracts do not yet exist. Support for our undergraduate program will provide for necessary updates and improvements to our lab facilities and senior design courses, student participation in undergraduate research, as well as professional development activities for students such as research conference participation or plant visits. Select additional needs include resources to support faculty and staff professional

development, facilities upgrades (classroom and seminar room equipment, undergraduate computer lab, student study lounge, BMES Chapter office). The continued success of the BME department depends on your partnership with us.

For additional information about giving to the Biomedical Engineering Program, contact Mr. Paul George, Director of Development, School of Engineering at (205) 934-8481 or pjgeorge@uab.edu

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OTHER BME NEWS

Student Awards:

Joel Anderson, 2010 NIH Ruth L. Kirschstein National Research Service Awards for Individual Predoctoral Fellows (F31); 2010 UAB Graduate Student Research Days, Life Sciences Session, 1st place; 2010 UAB's Fifth Annual School of Dentistry Scholars' Symposium, Basic Sciences Poster Division (Pre-doctoral), 3rd place

Adinarayana (Adi) Andukuri, 2010 American Heart Association Predoctoral Fellowship; 2010 UAB Graduate Student Research Days, Science and Engineering Session, 2nd Place

Leigh Booth, 2010 Ireland Tuition Scholarship ; Best Poster award at the joint International Conferences "5th Wide Bandgap Materials - Progress in Synthesis and Applications" & "7th Diamond & Related Films" held together with "2nd International Workshop on Science and Applications of Nanoscale Diamond Materials", Zakopane, Poland

Claire Bourgeois, 2010 Ireland Tuition Scholarship
Katie Culpepper, 2010 Samuel B. Baker Award for Excellence in Graduate Studies for Master's level.

Greg Hoeker, 2010 American Heart Association Predoctoral Fellowship; 2010 BME Graduate Student of the Year

Dina Halwani, 2010 UAB Graduate Student Research Days, Physical Science and Engineering Session, 3rd Place

Daniel Lim, Daniel Lim (Jun) – 2010 American

Diabetes Association (ADA) Meeting Travel Award from The UAB Diabetes Research and Training Center

Rajiv Menon, 2009 Young Investigator Award, Frontiers of Biomedical Imaging Science Annual Meeting (Photo on page 4)

Amanee Salaam, 2009 NSF Predoctoral Fellowship; Best Poster award at the joint International Conferences "5th Wide Bandgap Materials - Progress in Synthesis and Applications" & "7th Diamond & Related Films" held together with "2nd International Workshop on Science and Applications of Nanoscale Diamond Materials", Zakopane, Poland

Brittany Sowell, 2010 Ireland Tuition Scholarship

Jonathan Suever, (BS Alumni) NSF Graduate Research Fellowship and AHA Predoctoral Fellowship

Faculty Awards:

Alan Eberhardt, Promoted to the rank of Professor (with tenure), October 2009

Vladimir Fast, NIH RO1 "Mechanisms of Defibrillation and Shock Induce Arrhythmia", (2009-13)

Ho-Wook Jun, 2010 Graduate Dean's Award for Excellence in Mentorship; NSF CAREER Award (2010-2015); 2010 Finalist (With Dr. Brigitta Brott, Cardiology), Alabama LaunchPad Business Plan Competition; Wallace H. Coulter Foundation Phase 2 award "Biomimetic Nanomatrix for Drug Eluting Stent Application" (2009-2011); American Diabetes Association Research Grant, "Biomimetic Nanomatrix to Increase the Efficacy of Islet Transplantation"(2009-10); 2009 Innovation Award from the



Greg Hoeker and Katie Culpepper received awards at the 2010 Graduate School Awards Ceremony.

American Diabetes Association

Andy Pollard, NIH RO1 "Novel Methods for Cardiac Micro-Impedance Measurement" (2009-2014)

Jack Rogers, AHA Grant-in-Aid, "Simultaneous Mapping of Voltage, Calcium, and Wall Motion"
Yuhua Song, NIH k25 Award "Protein Interactions Underlying Fas-Mediated DISC in Cholangiocarcinoma"

Timothy Wick, Keynote Speaker for the Bioengineering Theme, "CFD2009: The 7th International Conference on CFD in the Minerals and Process Industries", Melbourne, Australia (December 2009)