



Colorado State University

SCHOOL OF BIOMEDICAL ENGINEERING

Special points of interest:

- SBME creates new BME Award for E-Days participants.
- Lisa and Desi Rhoden name the biomedical engineering and teaching laboratory in the new Scott Bioengineering Building.
- Grand Opening of the Scott Bioengineering Building takes place on Thursday, September 12, 2013.

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Message from the Director

Spring, symbolically, is a time for new beginnings and growth, and so it is at the School of Biomedical Engineering at Colorado State University.

Since the beginning of 2013, we have made tremendous progress building local area industry collaborations. Currently, we are working with the Northern Colorado Bioscience Cluster and UC Health on biosensors, imaging, biomaterials and tissue engineering products. We brought on four new faculty members to expand our interdisciplinary reach and welcomed two new members to the SBME Advisory Board to expand industry relations. We added a new category to reward excellence in biomedical engineering at Engineering Days (E-Days). This long-standing

tradition of CSU excellence showcases the work of senior engineering students across all engineering disciplines.

Lastly, but certainly not least, we are proud of our fundraising efforts to date. A biomedical engineering scholarship fund has been established, thanks to the generous support of SBME Advisory Board members. This scholarship, along with several other funding initiatives, will be showcased in our upcoming beta test of a new crowdfunding platform. Please stay tuned for more information on this exciting new initiative. Additionally, Lisa and Desi Rhoden, alumni of the College of Engineering, have donated \$250,000 to name the biomedical engineering and teaching laboratory in the new Scott Bioengineering Building. We



Dr. Stuart Tobet, director

are delighted and gratified by their generous support.

If you would like more information, feel free to reach out to me directly at (970) 491-7157 or Stuart.Tobet@colostate.edu.

New SBME Scholarship Fund

At the SBME Advisory Board Meeting in April, members agreed to establish and seed the SBME Scholarship for Leadership and Innovation. Perhaps it was seeing first-hand the remarkable students and their innovations at E-Days that inspired them to create the first-ever biomedical engineering scholarship at CSU.

The scholarship is set up as a pending endowment to support graduate and undergraduate students pursuing careers in biomedical engineering. This type of fund allows for annual expendable gifts while the endowment is growing. The goal for this pending endowment is to reach \$25,000 within five years. If you would like to contribute to the SBME Scholarship for Leadership and Innovation, you may do so at <https://advancing.colostate.edu/SBME>.

E-Days: New Biomedical Engineering Award

Award-winning student design projects from biomedical, chemical, civil, electrical and computer, and mechanical engineering are what draws visitors from the community and industry to Engineering Days (E-Days) each year.

This year, two of the E-Days teams won cash awards from the SBME Advisory Board for their outstanding achievements in biomedical engineering.

First place honors went to the mechanical engineering team of Sultan Alamri, Ryan Oba, Thomas Peterson, Pete Schiel, and Randy Vieira (Christian Puttlitz, faculty adviser) for their “Wheelchair Backpack Retrieval Device” which allows a wheelchair user to push a button and bring a backpack from the back of the wheelchair to within reasonable reach in the front. It is powered independently from the chair’s power source and is also water and corrosion resistant. The Board recognized the novel and insightful way in

which the device uses strong engineering principles to solve a real problem in a well thought-through, useful manner that incorporated the end-user’s input.

Second place was awarded to the chemical and biological engineering team of John Ekblad, Brett Hill, Jackson Lewis, Max Musgrave, and Elliott Pyles (Ashok Prasad, faculty adviser) for their “Comparison of Conventional and Helical Shaped Arterial Stent Designs Using

Computational Fluid Dynamics (CFD).” The Board applauded the strong technical competency as well as the professional and articulate presentation of the project that used CFD to evaluate the blood flow properties of a helical stent by analyzing shear stress distributions, velocities, and pressures to improve post-operative vascular integration.

E-Days allows senior undergraduate students to display and present their work helping them develop practical,

hands-on skills and teaches them how to succeed in an integrated, interdisciplinary engineering design environment. Senior design challenges students to think creatively and empowers them to take responsibility for all phases of their project, from design and manufacturing to documentation and marketing.



Chemical and biological engineering students were awarded the second place prize for the best BME project at E-Days. **From left:** John Ekblad; Elliott Pyles; Jackson Lewis; Max Musgrave; Ashok Prasad, faculty adviser; and Brett Hill.



Mechanical engineering students were awarded the first place prize for the best BME project at E-Days. **From left:** Randy Vieira, Pete Schiel, Ryan Oba, Sultan Alamri, and Thomas Peterson.



2013 E-Days draws large crowd of spectators, including prospective students, industry leaders, and visitors from the community.

New SBME Advisory Board Members

Clay Anselmo

Clay Anselmo is the CEO of Reglera, a Dohmen Company, that specializes in regulatory compliance and quality assurance consulting and process outsourcing.

With more than 20 years' experience in operations and management in the medical device and tissue bank industries, Anselmo has advanced the organization into one of the largest and fastest growing companies in its marketplace.



Prior to co-founding Reglera in 1999, Anselmo worked for COBE Laboratories / GAMBRO Healthcare. There, he was instrumental in providing streamlined organization which led the company to establish world-class quality systems. In addition, he played a key role in resolving chronic problems with the FDA that threatened to close the company's US

operations.

Prior to working with GAMBRO, Anselmo worked with Alcon Laboratories bringing two of the most successful ophthalmic surgical instruments to market.

Anselmo graduated from the University of Washington with a Bachelor of Science in mechanical engineering.

Dennis Schlaht

Dennis Schlaht ('83 B.S.E.E.) is the Vice President of Product Development at ImpediMed, a world leader in the development and distribution of medical devices employing Bioimpedance Spectroscopy (BIS) technologies for use in the non-invasive clinical assessment and monitoring of fluid status. Schlaht joined the company in October of 2007 as part of the company's acquisition of XiTRON Technologies, Inc.

While at XiTRON, Schlaht served as Vice President for Marketing and Product Development, then as President. Prior XiTRON, he worked for Insight Electronics leading the company's Wireless Solutions Group.

The first part of Schlaht's career began at Lockheed Martin, where he held numerous positions in radio frequency and laser communications design, field service, proof-of-concept development, and program management.

Schlaht is a graduate of Colorado State University and holds a Bachelor of Science in electrical engineering. He later completed post graduate coursework at UCLA and UCSD.



New SBME Faculty Members



Chris Ackerson joined the School of Biomedical Engineering as an associate faculty member. His lab works at the interface of nanoparticle chemistry and biology, developing novel synthetic chemical means for measuring and influencing biological events. Joining the biomedical engineering faculty, he hopes to apply his emerging technology to compelling biological problems.



Susan De Long joined the School of Biomedical Engineering as an associate faculty member. Her research expertise is in the development and application of quantitative molecular biology tools for the analysis of microbial communities and is eager to begin studying microbial communities found in medical contexts, especially the human microbiome.



Dan Gustafson joined the School of Biomedical Engineering as a core faculty member. He is the director of research at the CSU Flint Animal Cancer Center. Gustafson's research focuses on developing therapeutic treatment modalities for cancer with an emphasis on the pharmacology of agents used in combination cancer treatment.



Steve Dow serves as a core faculty member for the School of Biomedical Engineering. He studies the role of innate immunity in the development and progression of cancer and in the pathogenesis of bacterial infections in addition to investigating the use of novel immunotherapeutics to treat or prevent bacterial and viral infections and cancer and in the development of new vaccine adjuvants.

Alumni Spotlight: Barbara Smith, Ph.D.

Anyone lucky enough to have met or worked with Barb Smith knows only too well the passion and enthusiasm she has for her research and the world around her.

“We live in such an amazing world—it would be a pity to miss it!” Smith says. Having traveled to 45 countries, trekking across Asia, Europe and the Americas; from Mongolia to Chile, Smith has gained a sensitivity through the people, places, food, cultures, and moments she has experienced. She enjoys taking time off every few years to travel across a region of the world and further expand her “understanding of cultures, societies, and world needs that directly correlate with [her] current research interests.”

Smith chose CSU’s School of Biomedical Engineering to

pursue her Ph.D. because she “recognized that the faculty are highly intelligent, motivated, and personable individuals who truly enjoy their work. They successfully produce beneficial science and collaborate on a daily basis, across disciplines.” She soon realized, having worked alongside Dr. Ketul Popat, that the graduate program “provides a platform for one-on-one interactions with faculty members, where graduate students feel a certain ownership for their work and have a strong impact on the direction of the program at large.”

After graduating with a Ph.D. in Biomedical Engineering from CSU in 2012, Smith began work as a postdoctoral fellow in the laboratory of George M. Whitesides at Harvard University. Today, her research interests focus on the development of diagnostic

devices for the developing world, the mechanical stimulus of cells, and protein biophysics.

When asked what she hopes to accomplish in life, she stated that she wants “to be a source of knowledge and support for those around [her], guiding the next generation of scientists.” Making a difference in the lives of students and improving human health in the developing world is how she plans to make an impact as an educator and as a researcher.

Smith says she enjoys, “traveling (nationally and internationally), reading, experiencing and supporting the arts, hiking, and enjoying the great outdoors.”



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Online Biomedical Engineering Program

Colorado State University’s online graduate engineering programs received top spots from *U.S. News & World Report* magazine. According to a 2012 survey of top online education programs, it was ranked 10th in the nation for “faculty credentials and training,” and 6th for “student services and technology.”

The School of Biomedical Engineering offers an online Master of Engineering (M.E.) with a biomedical engineering specialization through CSU’s OnlinePlus. This 30-credit coursework-only program is uniquely positioned to offer educational strengths in engineering, the sciences, and animal and human medicine. Students attend online classes taught by CSU faculty within a flexible delivery format allowing for greater convenience.

OnlinePlus and SBME have come together to offer its first biomedical webinar. Shantel Rizzotto, student engagement coordinator, OnlinePlus; Sara Neys, graduate advisor, SBME; and Dr. Ketul Popat, assistant professor, Mechanical Engineering and SBME, participated in the webinar. Together, they fielded questions about the application process and curriculum from prospective students across the country. The webinar was recorded for those unable to attend the live webinar. To view the webinar, visit <http://bit.ly/ApplyforCSUBiomEng5913>.



SBME Staff and Student Achievements

SBME GRADUATE HELPS DEVELOP PROSTHETIC TAIL FOR ALLIGATOR

After having his tail bitten off when he was just a baby, Mr. Stubbs, a rescued eleven-year-old alligator residing at the Phoenix Herpetological Society, was likely to develop severe spinal problems and was left unable to swim in deep water. Thanks to the efforts of The CORE Institute in Phoenix, Arizona, Mr. Stubbs was able to receive a high-tech tail made out of silicon rubber.

Sarah Jarvis ('11 M.S.), an orthopedic research associate, worked alongside Dr. Marc Jacofsky to build the prosthetic tail which mimics a similar-sized alligator. Considerable research went into developing the tail and infrared video cameras are being used to track the alligator's motion as he adapts to the new tail. "When you do a process that hasn't been done before, you always learn something that you can then apply in another area," said Jacofsky.



It will take Mr. Stubbs some practice to learn how to maneuver, swim, and dive by propelling his new tail. As he grows, researchers expect he will need a new prosthetic every couple of years. To view a short documentary, visit <http://vimeo.com/65147665>.

REGULATORY AFFAIRS DIRECTOR NAMED DIRECTOR OF NORTHERN COLORADO BIOSCIENCE CLUSTER

Deanna Scott, director of the Regulatory Affairs Interdisciplinary Program in the School of Biomedical Engineering, was named the new executive director of the Northern Colorado Bioscience Cluster (NoCoBio) in December 2012.

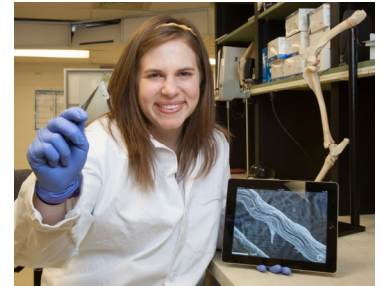


Scott brings numerous years of experience and industry connections to her new role at NoCoBio. Most notably, she developed, funded and delivered Colorado's first regulatory certification program with the help of the Regulatory Affairs Industry/Academic Consortium. She is excited to see NoCoBio thrive with the opening of the Colorado State University Research Innovation Center, stronger collaborations with the Colorado BioScience Association (CBSA), the city of Fort Collins, CSU, and the Medical Center of the Rockies.

Launched in 2004, NoCoBio aims to drive the region's life sciences community—scientists, physicians, leading innovators, and executive advisors—to maximize the impact of Northern Colorado resources and provide the foundation necessary to attract bioscience research and product development to the Rocky Mountain region.

SBME PH.D. STUDENT AWARDED WHITAKER INTERNATIONAL SUMMER FELLOWSHIP

Hannah Pauly, SBME Ph.D. student, has been selected for a 2013 Whitaker International Program Summer grant. Hannah will travel to Trinity College in Dublin, Ireland to work with Irish collaborator Dr. Daniel Kelly, director of the Trinity Centre for Bioengineering.



Hannah will work on a collaborative project between Dr. Kelly and CSU researchers Tammy Haut Donahue and Ketul Popat, both mechanical engineering faculty. She will also visit with a collaborator, Dr. Nicholas Dunn at Queens University in Belfast.

Hannah will be working on a tissue engineering project that aims to recapitulate the developmental processes to regenerate the bone-menisceus interface using a novel bio-inspired fiber reinforced hydrogel.

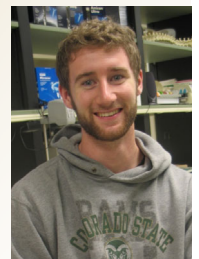
STUDENT SUCCESS AT ROCKY MOUNTAIN REGIONAL AMERICAN SOCIETY OF BIOMECHANICS

Two SBME students walked away with monetary awards from the third annual Rocky Mountain Regional American Society of Biomechanics Conference (RMASB) held in Estes Park, Colorado from April 12-13, 2013.

SBME graduate student, Hannah Pauly, received the Best Presentation Award for her paper titled, "Micro-Computed Tomography Analysis of Bone Volume Following Traumatic Closed Joint Injury."



Garrett Goatney, dual degree undergraduate (BME with mechanical engineering) received the Best Poster Award for his poster titled, "P188 Efficacy on Lapine Meniscus Preservation Following Blunt Trauma."



The goals of the conference included providing a low-stress environment where students can practice presenting their research and receive constructive feedback as well as fostering research collaborations between scientists in the Rocky Mountain region.

The Scott Bioengineering Building

In the coming months, the College of Engineering will occupy the new Suzanne and Walter Scott, Jr. Bioengineering Building, a 122,000 square foot research and academic facility that will focus on solving global challenges through interdisciplinary collaboration.

Level 3 Communications Chairman Walter Scott Jr., a Colorado State University alumnus and one of the nation's most respected corporate leaders, with his wife, Suzanne, have committed \$10 million toward the teaching, laboratory, and research space which includes a 130-person auditorium, multiple classrooms, design studios,

teaching laboratories and a 24-hour study space for all CSU students.

Lisa and Desi Rhoden, alumni of the College of Engineering, have donated a \$250,000 gift to name the biomedical engineering and teaching laboratory that will impact numerous students seeking careers in academia, government, and industry. The Lisa and Desi Rhoden Biomedical Engineering and Teaching Laboratory will host the new junior level BME laboratory course beginning the Spring 2014 semester.

The building will also house offices for the School of Biomedical Engineering, which encompasses faculty from four

colleges across CSU's campus.

The Scott Bioengineering Building is expected to hold a Leadership in Energy and Environmental Design (LEED) Gold Certificate, in accordance with the green building rating system developed by the U.S. Green Building Council.

Be sure to join us for a tour and reception on Thursday, September 12, 2013 at the Grand Opening of the Suzanne and Walter Scott, Jr. Bioengineering Building. For more information, contact (970) 491-7028.



Walter and Suzanne Scott



Suzanne and Walter Scott, Jr. Bioengineering Building



Lisa and Desi Rhoden Biomedical Engineering and Teaching Laboratory

SBME Industry Collaboration

The School of Biomedical Engineering thrives on academic and industry collaborations and encourages transdisciplinary thought, ideas, projects, and inventions. In an effort to increase such interactions, SBME is working with the Northern Colorado Bioscience Cluster, University of Colorado Health - Medical Center of the Rockies (MCR) and the Orthopaedic & Spine Center of the Rockies (OCR) to identify and create collaborative opportunities.

In the past year, SBME faculty have met with physicians from MCR and OCR to begin discussions leading to innovative science, translational projects, and pathways to commercialization. Growing our relationships with the goal of targeting unmet medical needs will add to our productivity in ways that help solve important problems with large societal impact.

In November 2012, Dr. Julie Dunn, Trauma 1 Research Surgeon with MCR, met with more than a dozen interdisciplinary faculty within SBME to identify key collaborative opportunities. Discussions ranged from biosensors and imaging, to biomaterials and tissue engineering products. The groups identified 18 areas of potential interest. Examples of growing collaborations to date include:

- Joint submission of an

exploratory grant (R21) to the National Institutes of Health (NIH) with Dr. Melissa Reynolds, Department of Chemistry, seeking \$275,000 for surgical mesh wound healing research.

- A Uniform Biological Material Transfer Agreement (UBMTA) was established between UC Health and CSU, and with key regulatory approvals, tissues have been transferred for a bone marrow inflammatory marker study in collaboration with the chemical and biological engineering department. Once the biomarkers are identified, an R21 grant will be submitted to the NIH proposing to create a diagnostic biosensor for early identification of bone breaks in trauma patients.
- Dr. Jennifer Mueller and her colleagues in the mathematics department have created a lung water-monitoring device. After proof of concept testing with UC Health, a joint submission will be made with the National Trauma Institute to perform a multi-site study.
- Students have also been engaged in collaborative processes. Dr. Dunn worked with mechanical and electrical engineering students on the LifeBoard Resuscitation

Communication Tool for a senior design project. The product was showcased at the annual College of Engineering E-Days this spring.

In March, orthopaedic physicians from OCR also met with more than a dozen interdisciplinary faculty from SBME to identify collaborative opportunities. Discussions ranged from biomaterials, medical devices, and tissue engineering, to new innovations in orthopaedics. Examples of growing collaborations and teaching interactions include:

- Graduate students from Dr. Tammy Haut Donahue's laboratory observing Dr. Kirk Kindsfater of OCR perform knee replacement and ACL reconstructive surgery.
- Transfer of meniscal tissues removed during surgery to CSU laboratories. These tissues, through an existing tissue transfer agreement, will be used to characterize meniscal attachment degradation.

The benefits of these types of interactions for UC Health and OCR include greater access to state-of-the-art research protocols, which can translate to higher quality of care faster. It also allows the local hospital communities the opportunity to attract and keep physicians who are interested in engaging in research. For CSU, it allows greater access to patient populations that can best benefit

from new advances in biomedical research. This, in turn, creates greater joint development opportunities for both entities. For Northern Colorado Bioscience, it brings the potential for greater economic development and retention of intellectual property that has been developed through the projects involved with local research. And finally, for all parties, it provides for more competitive projects that pair direct connections to healthcare with a strong academic research institution and a growing, local bioscience industry.

If you would like to begin a conversation with SBME to discuss a beneficial collaboration, please contact Director Stuart Tobet at Stuart.Tobet@colostate.edu or (970) 491-7157.



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FIND US ON:



SBME Events Calendar



SEPTEMBER 2013

Grand Opening of the Suzanne and Walter Scott, Jr. Bioengineering Building

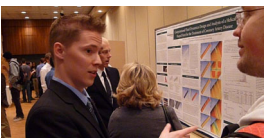
Sept. 12 / Scott Building / 3:30 p.m.
Ribbon Cutting, Reception, and Tours



OCTOBER 2013

CSU Homecoming Weekend

Oct. 10-13 / CSU Campus / All-day events
www.homecoming.colostate.edu



APRIL 2014

Engineering Days (E-Days)

Date TBD

Class Notes: BME Alumni

Your former classmates are eager to hear from you! Keep them informed of your career accomplishments and personal achievements through the Class Notes section. In future editions of the SBME newsletter, we will be publishing life updates of BME alumni. Updates can include a new job, promotion, award, further education, volunteer work, marriage, birth, or any accomplishment that you would be proud to share. If you are open to others connecting with you, please provide your email address and ask that it be published along with your news.

Please send your updates and photographs to Allison.Robin@colostate.edu. If you chose to send an electronic image, be sure it is a high resolution photo of at least 300 dpi. We look forward to hearing from you!