SLU SCHOOL OF SCIENCE AND ENGINEERING SEPT 2024

SLU BIOMEDICAL ENGINEERING NEWSLETTER

SAINT LOUIS UNIVERSITY

DEPARTMENT OF BIOMEDICAL ENGINEERING

IN THIS ISSUE

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BACK TO SCHOOL MESSAGE FROM THE BME CHAIR

Welcome Home, Students!

For those of you who are returning, I believe you know what I mean. For those of you who are new to SLU BME, I hope you come to feel like BME is a home of sorts. While I dare not suggest that we are like the home where you spent your childhood, where your family is, or where your closest friends are, I do hope that you come to think of SLU BME in a similar sort of way. I can assure you that, just like home, all the faculty and staff in BME are committed to your well-being, to your growth as a Biomedical Engineer, and to the opportunities that will make your career successful.

Like home, in BME you can find a sympathetic ear, advice on various things like jobs, internships, grad school, and almost anything career-related, and if you find yourself in a position where you don't know something, we can help with almost anything. (cont. p. 2)

MESSAGE FROM THE BME CHAIR CONTINUED

Mentoring is important, and you've probably seen or heard much about mentoring since the Fall semester began. For new students, get to know your Faculty Mentor and consider participating in one of the opportunities to gain mentoring, like the SSE Mentor Collective. For returning students, consider being a mentor; the things you know about SLU and BME are valuable and can change lives.

BME is going to host a regular "BME Hangout and Games" event on the patio next to McDonald Douglas Hall. The first of these events is going to be September 17th, starting at 5 p.m. Come grab a soda and a cookie and challenge me or anyone to a round of axe throwing. Last time, I was pretty solid. And if you are hanging with a friend and don't want to leave them to come to the hangout, bring them. That's what we'd do at home, right?

Finally, I mentioned well-being earlier, but I've said nothing about performance. Both are important, but one should never sacrifice well-being for performance. Procrastination can have a negative effect on performance, and it can make you think that an all-nighter is needed, so simply doing a little work each day may be a great way for you to stay on top of things. I hear this regularly from our great group of experienced students, especially from my senior homies.

See you soon,

J. Gary Bledsoe, Ph.D.
BME Department Chair
Professor

Click **here** to learn more about mentoring opportunities, including being a peer mentor to a first year student or being matched with an SSE alum.

NEW FUNDING FOR MUSCULOSKELETAL BIOMECHANICS LAB

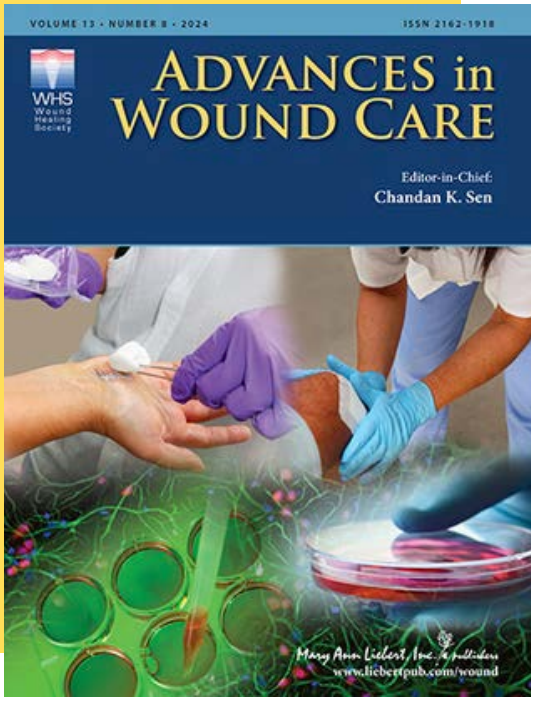
Alex Reiter, Ph.D., Assistant Professor of Biomedical Engineering, was awarded a 2-year National Institutes of Health R03 grant for over $300k for his project titled, "Noninvasive Assessment of In Vivo Tissue Loads Following Treatment of Volumetric Muscle Loss." **Dr. Koyal Garg**, Biomedical Engineering Associate Professor, will serve as co-invesitagator. To learn more about Dr. Reiter's Musculoskeletal Biomchanics lab click **here**.

BME FACULTY SERVE AS GUEST EDITORS

Drs. Koyal Garg and Alex Reiter are serving as guest editors for the call for papers titled, "Integrative Strategies for Accelerated Recovery Following Musculoskeletal Injuries" in the Journal of Physiology. Several leading experts in skeletal muscle and tendon injuries have committed to submitting their research articles. They are enthusiastically participating in the peer review process to ensure the highest quality of contributions. Click **here** to learn more.

Additionally, **Dr. Koyal Garg** served as the guest editor for the special issue on "Volumetric Muscle Loss" in the prestigious journal, Advances in Wound Care, which is the leading publication of the National Wound Healing Society (WHS). In this role, Dr. Garg curated a collection of groundbreaking research articles by inviting top experts in the field and actively participating in the peer-review process. This special issue featured a series of captivating submissions that have significantly advanced the field of VML research.

MUSCULOSKELETAL TISSUE ENGINEERING LAB PUBLICATIONS



Dr. Koyal Garg, BME Associate Professor, along with Dr. Prabaha Sikder, Assistant Professor of Mechanical Engineering at Cleveland State University, are co-authors of a publication titled, "Extrusion-Based 3D Bioprinting of Bioactive and Piezoelectric Scaffolds as Potential Therapy for Treating Critical Soft Tissue Wounds" in the Advances in Wound Care journal. Click **here** to read the abstract.

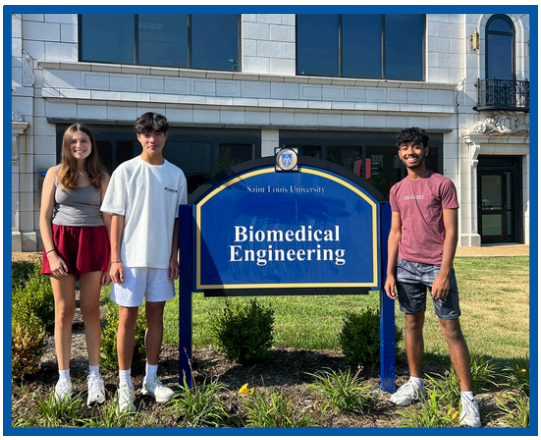
2024 BME graduate, **Dr. David Johnson**, and colleagues from **Dr. Garg's** lab collaborated with Dr. Ken Bertram from Wake Forest Institute of Regenerative Medicine, and had a research article published in the Advances in Wound Care journal titled, "Biosponge-Encased Placental Stem Cells for Volumetric Muscle Loss Repair." Click **here** to read the abstract.

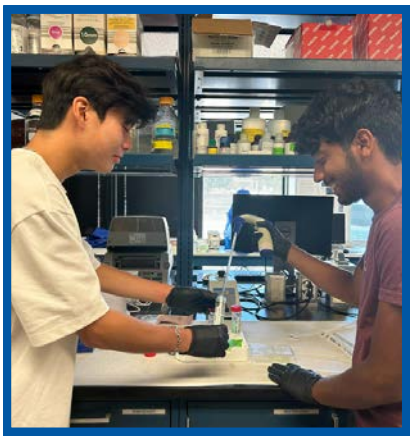
Full author list: **David Johnson**, **Mia Ridolfo**, **Ryan Mueller**, **Megan Chermack**, **Julia Brockhouse**, **Jamshid Tadiwala**, **Avantika Jain**, Kenneth Bertram, and **Koyal Garg**

BME STUDENT SELECTED AS A DENARDO IDBI-SPUR FELLOW

Congratulations to BME senior, **Mia Ridolfo**, who was selected as a DeNardo IDBI-SPUR Fellow. The DeNardo IDBI-SPUR Fellowship is a 10-week full-time fellowship (40 hours/week), which ran from May 28 – August 2, 2024. Mia worked in **Dr. Koyal Garg's** Musculoskeletal Tissue Engineering Lab and received a $6000 stipend. Mia's research focused on developing a tissue culture device to model neuromuscular junctions in vitro. She worked on optimizing culture conditions of muscle progenitor cells and neural progenitor cells on the tissue culture device. Mia will present her research at the IDBI Research Symposium on September 6, 2024. To learn more about this fellowship click **here**.

2024 SUMMER STUDENT VISITORS TO BME





This past summer, **Dr. Koyal Garg's** Musculoskeletal Tissue Engineering Lab and **Dr. Silviya Zustiak's** Biomaterials and Tissue Engineering Lab had the pleasure of hosting talented summer interns. Dr. Garg's lab welcomed Stephen Shaji, a Project Interface Summer Intern from Eureka High School, Natalie Wolk from Ladue Horton Watkins High School, and Vincent Ly from Saint Louis University High School. These students were tasked with creating electrostatic microparticles of gelatin (MicroGels) for the delivery of biologics, such as stem cells and growth factors. They approached their projects with great enthusiasm, diligently gathering data under the mentorship of our experienced graduate students, **Jamshid Tadiwala, Avantika Jain,** and **Mia Ridolfo**, who provided essential training and troubleshooting support. Their dedication and hard work yielded impressive results. The students' abstract titled, "Electrostatic MicroGels for Biologic Delivery," was accepted for a poster presentation at the IDBI symposium at SLU, which will be presented on September 6th.

Dr. Zustiak's lab welcomed Nathan Ly, a sophomore at Stanford University who is studying Bioengineering and Computer Science on the pre-med track. Nathan had the opportunity to evaluate the changes in synovial fluid properties, such as viscosity and coefficient of friction, due to chronic and acute conditions. This project allowed for Nathan to use a custom tribo-rheology setup to compare the synovial fluid from ACL tear patients and osteoarthritis patients, offering insights into the mechanical impacts of these conditions on joint health.

I gained skills in using specialized lab equipment and analyzing data, which will help me in my future work in biomedical engineering. I furthered my understanding of biomechanics and pathologies. - Nathan Ly from Stanford University

Working in a biomedical engineering lab allowed me to gain invaluable hands-on experience! I had such a wonderful opportunity to work on a project with two other high schoolers and contribute to impactful research that could possibly advance technology in the medical field. - Vincent Ly from Saint Louis University High School

KHALIFA UNIVERSITY SCHOLAR VISITS DR. ZUSTIAK'S LAB

جامعة خليفة
Khalifa University

M. FAROOQ RAI, PH.D.
ASSISTANT PROFESSOR

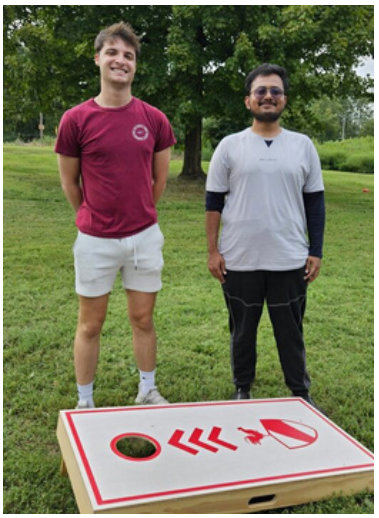
Dr. M. Farooq Rai is an Assistant Professor at Khalifa University College of Medicine and Health Sciences in the Department of Biological Sciences in Abu Dhabi. Dr. Rai also holds adjunct faculty positions at Saint Louis University and Washington University School of Medicine. With a Ph.D. in Biochemistry from the Free University of Berlin, Dr. Rai's expertise spans cellular and molecular biology, focusing on identifying early molecular events in osteoarthritis and finding innovative gene regulation techniques for treating this disease. His work has earned him numerous prestigious research awards and fellowships.

Dr. Rai completed a productive three-week research visit to Saint Louis University over the summer, where he had the opportunity to work with his longstanding collaborator, **Dr. Silviya Zustiak**, and her team in the Biomedical Engineering Department. Their joint research focused on the biological and mechanical properties of the synovial fluid from patients with knee ligament injuries (non-arthritic) and patients with osteoarthritis (arthritic). In this regard, **Dr. Samuel Stealey**, a postdoctoral research fellow in Dr. Zustiak's laboratory, developed new tools to measure the physical and mechanical properties of these samples. Drs. Rai and Stealey analyzed the data and discovered intriguing differences in the properties of synovial fluid in arthritic and non-arthritic patients. Dr. Rai and Dr. Zustiak's team submitted their research findings to the Biomedical Engineering Society Annual Meeting, where the abstract was accepted as a poster presentation.

Dr. Rai's visit to Saint Louis University was a professional milestone and a testament to the power of international collaboration. He expressed his gratitude to Khalifa University for facilitating this opportunity, which has strengthened the ties between the institutions and opened new avenues for future research.

BME NEW GRADUATE STUDENT WELCOME PICNIC

BME graduate students, faculty, and staff enjoyed an afternoon at Forest Park on August 24th, playing games, having dinner, and getting to know one another. BME welcomed 15 new BS/MS, MS, and PhD students this semester.



BME FALL SEMINAR – SEPTEMBER SCHEDULE

The BME department hosts a weekly seminar that features invited speakers from academia and industry as well as SLU biomedical engineering graduate students. The seminar is a great opportunity to learn about the latest research taking place broadly in the biomedical engineering field and the amazing work our graduate students are performing at SLU. Sign up **here** to receive BME Seminar announcements for upcoming speakers. This is separate from our newsletter distribution list.

9/4 Hu Yang, Ph.D., Professor, Chemical and Biochemical Engineering, Missouri S&T

9/11 Jamshid Tadiwala & Avantika Jain, BME Ph.D. Students, Dr. Garg's lab

9/18 Aubin Moutal, Ph.D., Assistant Professor, Pharmacology and Physiology, SLU

9/25 No seminar - Wellness Day

ALUMNI SPOTLIGHT

Gabriel Haas, 2020 BME graduate, created the startup GenAssist while working in **Dr. Koyal Garg's** Musculoskeletal Tissue Engineering Lab at SLU. GenAssist is commercializing a muscle-regenerating biomaterial that Gabriel co-invented with Dr. Garg. Their goal is to restore strength and mobility for victims of high-impact trauma and other muscle-related conditions.

GABRIEL HAAS

CO-FOUNDER AND CHIEF TECHNOLOGY OFFICER

GenAssist

What is your favorite part of your job?

As a founder and a scientist, I love that my job is multi-faceted. Mastering different skills is crucial for the business to succeed, but it also sets me up for future career success. My scientific and product development skills could land me a technical job at a biopharma company in the future, but also my transferrable business skills allow me to pursue non-technical opportunities as well.

How has SLU prepared you for your current job?

My entire career trajectory can be traced to when Dr. Garg and I were chosen to participate in the Collaborative Undergraduate Research Experience (CURE) Program* through Parks College. The $6000 stipend and $1000 research grant jump-started this entire project, which has led to a collective $2,200,000 in grant funding and company investment to develop this technology. The CURE Program also led to me working in Dr. Garg's lab for four years, where I acquired the skills needed to perform laboratory research and develop biomaterials for muscle regeneration. Additionally, two of our business advisors, Isaac Rodriguez and Matt MacEwan, were each guest lecturers in my classes. Their lectures focused on developing a biotech startup around products like ours, and I was able to make these important connections early on through their presence in the classroom.

*The CURE program ended in 2018.

CALLING ALL UNDERGRADUATES!

Are you eager to collaborate with professors and graduate students on impactful research? Want to gain hands-on experience that's advancing healthcare? Looking to develop lab skills and boost your resume? Apply for the BME Research and Experiential Learning Opportunities for Undergraduates! This program offers a unique chance to immerse yourself in meaningful research and practical applications. Don't miss out! Click **here** to fill out the application and then submit your resume to biomed@slu.edu.

THE MENTOR COLLECTIVE FOR UNDERGRADUATES AND ALUMNI!

We're calling on valued members of our community to serve in Saint Louis University's School of Science and Engineering Mentor Collective Alumni Network! This program matches undergraduate sophomores, juniors, and seniors with mentors like you who have been in their shoes and know first-hand what it's like to learn at SLU. Click **here** to sign up to be a mentor.

ATTENTION 2024 GRADUATES AND BME ALUMNI

Did you graduate this year? Are you a SLU BME Alumni? If so, we'd like to invite you to fill out the form below to give us your updated contact information (email) and tell us where you have landed after graduation. With your permission, we would love to highlight your career achievements and stay connected with you in the future! **BME ALUMNI FORM**

BME NEWSLETTER ACCESS

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