SLU SCHOOL OF SCIENCE AND ENGINEERING JUNE 2025

SLU BIOMEDICAL ENGINEERING NEWSLETTER

SAINT LOUIS UNIVERSITY

DEPARTMENT OF BIOMEDICAL ENGINEERING

IN THIS ISSUE

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NEW FUNDING FOR MUSCULOSKELETAL TISSUE ENGINEERING LAB

BME Associate Professor, **Dr. Koyal Garg,** was awarded $14,167 as the Principal Investigator of the project titled, "Immunotherapy for Composite Muscle-Nerve Trauma Repair." The grant comes from the Saint Louis University President's Research Fund.

Collaborators include Dr. Matt Wood (Washington University in St. Louis) and Dr. Richard DiPaolo (Saint Louis University).

WashU

SAINT LOUIS UNIVERSITY SCHOOL OF MEDICINE

In addition, Dr. Garg received an award from SLU's Health Research Grant Program amounting to $10,000. This grant is for her work as Co-Investigator for the project, "Investigating a Role for Lymphangiogenesis in Volumetric Muscle Loss Recovery." Dr. Vincenza Cifarelli (Saint Louis University) serves as the Principal Investigator.

SLU BME WELCOMES COR JESU ACADEMY STUDENTS - JUNE 3, 2024

SLU BME welcomed high school students from Cor Jesu Academy for an introduction to biomedical engineering as a discipline. After **Dr. Gary Bledsoe,** BME Professor and Department Chair, provided an overview of BME and our department, Associate Professor, **Dr. Koyal Garg** and her graduate students organized a fun and interactive session on "Biomaterials and Stem Cells." The high schoolers explored synthetic and natural polymers and how these materials can be used to regenerate tissues, replace joints and vessels, deliver drugs and cells, and guide stem cell fate. It was a truly bright and curious group of young women who asked great questions and brought a great deal of enthusiasm!

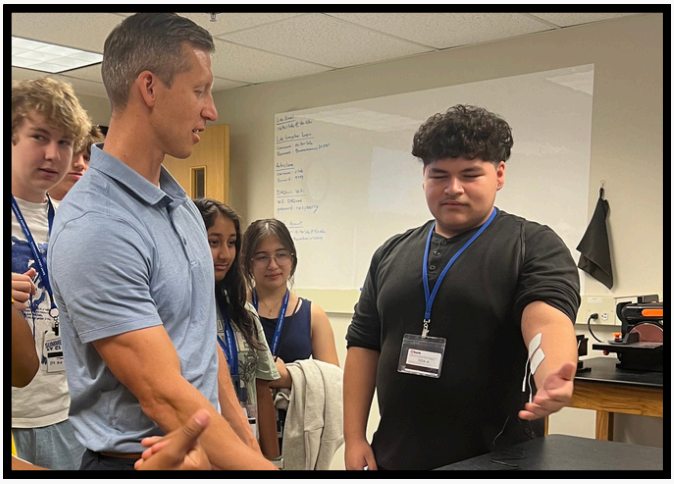
SLU BME HOSTS ENGINEERING SUMMER ACADEMY - JUNE 11, 2024

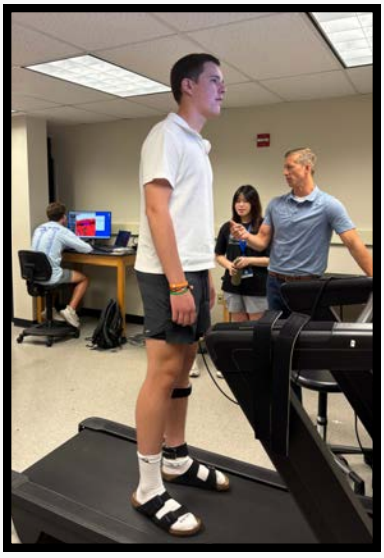
MUSCULOSKELETAL BIOMECHANICS LABRATORY

SLU's Engineering Summer Academy is a six day overnight camp designed to introduce high school students to careers in engineering. Faculty and student mentors guided students through activities and excursions. While visiting the BME department, students had the opportunity to learn from both the **Dr. Alex Reiter's** Musculoskeletal Biomechanics Lab and **Dr. Koyal Garg's** Musculoskeletal Tissue Engineering Lab.

While in the Musculoskeletal Biomechanics Lab, students discussed the numerous ways human movement can be measured with wearable sensors. Dr. Reiter explained the importance of knowing how healthy people move and what happens with injury.

Students wore a device capable of measuring the muscle and tendon forces in the calf while they walked, ran, and jumped. They then learned how the body creates muscle forces to cause movement. For their activity, pairs of students used a device to measure the muscle activity on their forearm and sent the signal to their partner's arm to cause a muscle contraction, effectively taking control of their partner's arm!





SLU ENGINEERING SUMMER ACADEMY CONT.

MUSCULOSKELETAL TISSUE ENGINEERING LABORATORY

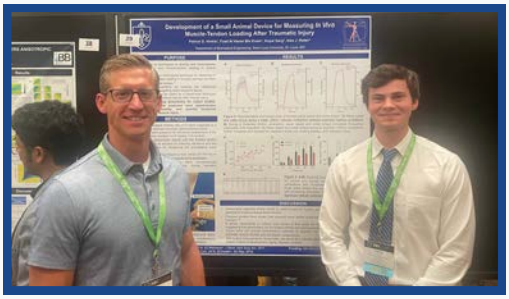
Dr. Koyal Garg's lab once again electrified students' understanding of muscle trauma and rehabilitation by running another hands-on electrical stimulation activity this summer, which was led by Ph.D. students, Jamshid Tadiwala and Rebecca Sheetz.

Students learned about the benefits of electrical stimulation-based rehabilitation for skeletal muscle recovery after traumatic injuries from Dr. Garg's research on rodents. They then had the opportunity to experience it firsthand.

The group placed electrodes on their forearms to trigger finger movement and on their biceps to activate elbow flexion using a TENS/EMS device. Their challenge? Build a pyramid of cups and then try to sign their name with a twitchy arm while their muscles are involuntarily contracting. Who knew cup stacking and calligraphy could be this exciting! The enthusiasm was contagious, and hopefully a few future careers in BME were sparked!

SUMMER BIOENGINEERING CONFERENCE - JUNE 22-26

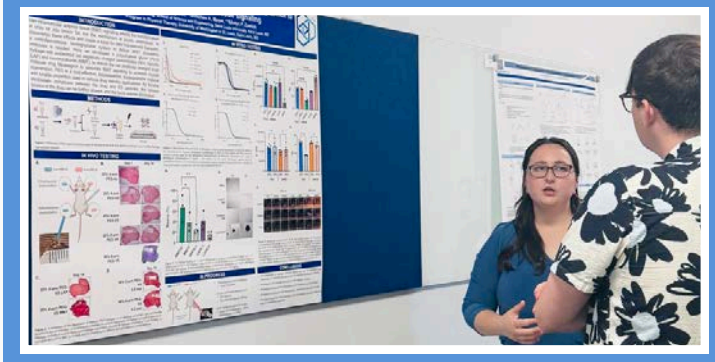
BME Assistant Professors, **Dr. Alex Reiter** and **Dr. Natasha Case,** along with 2025 BME grad, **Patrick Hinkle**, **M.S.**, attended the American Society of Mechanical Engineers (ASME) Summer Bioengineering Conference held in Santa Ana Pueblo, New Mexico. Dr. Case moderated the session, “Nano-to-Tissue Multiscale Mechanics II” and Patrick presented his research project titled, "Development of a Small Animal Device for Measuring In Vivo Muscle-Tendon Loading After Traumatic Injury." Co-authors included **Fuad Al Hasan Bin Enam**, **Koyal Garg**, and **Alex Reiter**.



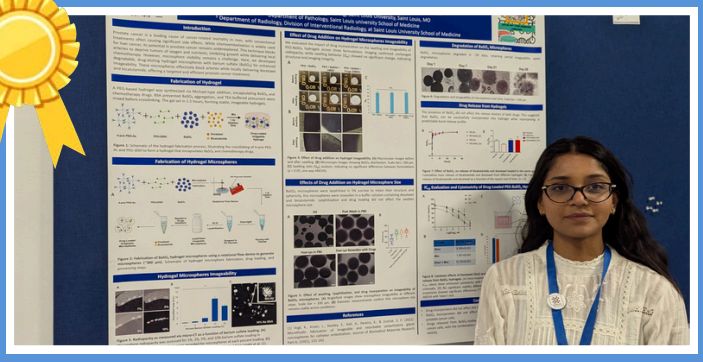
Congratulations to Patrick for winning 1st place in the Master's Student Paper Competition!

NATIONAL GRADUATE WOMEN IN SCIENCE CONFERENCE

The National Graduate Women in Science Conference was held at the Learning Resources Center on Saint Louis University’s medical campus on Saturday, June 21st. Graduate students from **Dr. Silviya Zustiak’s** lab presented posters at the annual meeting.



R. Boos, C. Gui, G.A. Meyer, S. P. Zustiak, “Development of Poly(ethylene) Glycol Hydrogel Drug Delivery Device to Study Intramuscular Adipose Tissue Signaling”



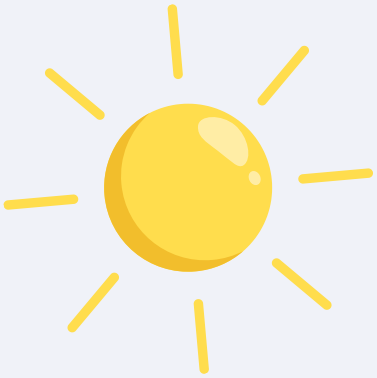
F. Jamali, R. Ray, K. Pereira, Silviya P. Zustiak, “Imageable Microgels for Targeted Multi-Drug Delivery in Prostate Cancer Chemoembolization” **(1st Place in Poster Competition)**

MASTER'S THESIS DEFENSE

Congratulations to **Patrick Hinkle, M.S.**, who successfully defended his master's thesis titled, "Development of a Small Animal Device for Noninvasive Measurement of In Vivo Muscle-Tendon Loading" on June 16th, 2025. This milestone was especially notable, as he became the first graduate of **Dr. Reiter's** Musculoskeletal Biomechanics Lab.

BME SUMMER SEMINAR

Join us for the second half of the BME Summer Seminar Series. It's a great opportunity to learn more about the research happening in BME labs this summer!



Where: BME 1004

When: 11:00 a.m. - 12:00 p.m.

Upcoming Dates:

7/16 Zustiak Lab: Sam Stealey, BME Post Doctoral Research Fellow

7/23 Case Lab: Maxwell Adinkra, BME Grad Student
Ephraim Agyei, HSSU UG Student
Gauri Menon, Health Sciences UG Student

7/30 Zustiak Lab: Tarini Karnati, BME UG Student
Hannah Johnson, BME UG Student