SLU SCHOOL OF SCIENCE AND ENGINEERING MAY 2025

SLU BIOMEDICAL ENGINEERING NEWSLETTER

SAINT LOUIS UNIVERSITY

DEPARTMENT OF BIOMEDICAL ENGINEERING

IN THIS ISSUE

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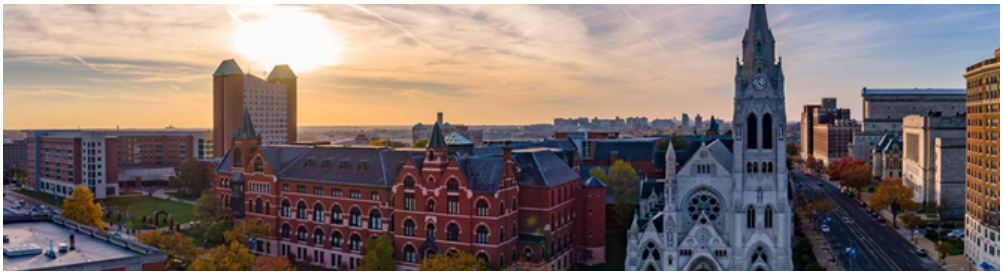


BME FACULTY AND STUDENTS HONORED AT SLU ATHLETICS STRAIGHT A BREAKFAST

On Tuesday, May 6th, BME student athletes were recognized at the Straight A Breakfast Celebration, an event honoring student-athletes who demonstrate exceptional academic performance alongside their athletic commitments. The celebration also highlights the faculty and staff who have made a meaningful impact on the students' academic journeys. **Dr. Silviya Zustiak** was invited by MS student and track and field athlete, **James Baker**; **Dr. Marta Cooperstein** was invited by sophomore soccer player, **Luciana Schwartz**; and **Dr. Alex Reiter** was invited by senior field hockey player, **Julia Rooijakkers**. Congratulations to all on this well-deserved recognition!

SSE FACULTY AND STAFF EXCELLENCE AWARDS

The School of Science and Engineering proudly recognized four outstanding BME faculty members at the 2024–2025 SSE Faculty and Staff Excellence Awards ceremony. These awards celebrated exceptional contributions to teaching, research, innovation, and leadership. **Dr. Natasha Case** received the Faculty Award for Teaching Excellence in the Engineering and Aviation disciplines, honoring her commitment to student learning and her impactful approach in the classroom. **Dr. Koyal Garg** was awarded the Faculty Award for Innovation, recognizing her forward-thinking contributions that push the boundaries of education and research. **Dr. Silviya Zustiak** earned the Faculty Award for Excellence in Research in Engineering and Aviation, celebrating her cutting-edge work and scholarly achievements. **Dr. Gary Bledsoe** was honored with the Faculty Award for Inspirational Leadership, acknowledging his ability to lead with vision, integrity, and dedication to the SLU mission. These awards highlight the remarkable talent and passion of SLU BME faculty and their ongoing commitment to academic excellence and student success. SSE Dean Gregory Triplett, Ph.D., pictured below, presented the awards.

Gary Bledsoe, Ph.D.
Inspirational Leadership

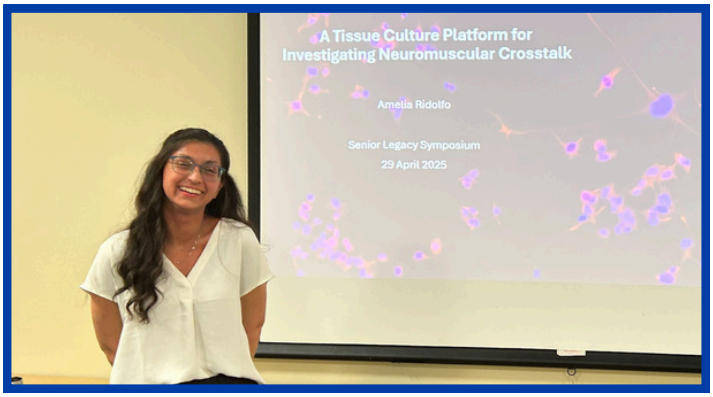
Natasha Case, Ph.D.
Teaching Excellence

Koyal Garg, Ph.D.
Innovation

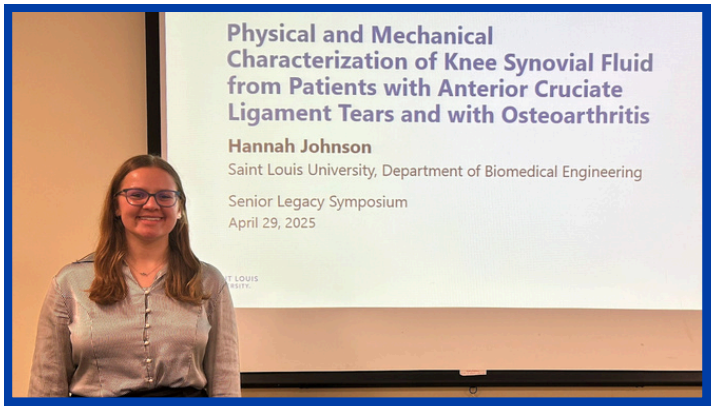
Silviya Zustiak, Ph.D.
Research Excellence

SENIOR LEGACY SYMPOSIUM

On Tuesday, April 29th, Saint Louis University proudly hosted the 18th annual Senior Legacy Symposium. Each year academic departments across the university invite up to three undergraduate students to present research, creative works, and share internship and service-learning experiences to a crowd of faculty, staff, students, alumni, and administrators. BME students, **Hannah Johnson** and **Mia Ridolfo** gave oral presentations about their research in Dr. Zustiak's lab and Dr. Garg's lab, respectively.



A. Ridolfo, "A Tissue Culture Platform for Investigating Neuromuscular Crosstalk."



H. Johnson, "Physical and Mechanical Characterization of Knee Synovial Fluid from Patients with Anterior Cruciate Ligament Tears and with Osteoarthritis."

DISSERTATION DEFENSE

Jakeh Orr, Ph.D. candidate working in Dr. Yan Gai's Neuroengineering lab, successfully defended his dissertation on May 7th titled:

"Physiologically Based Models and Algorithms for Smart Hearing Aids with Spatial Segregation and Localization."

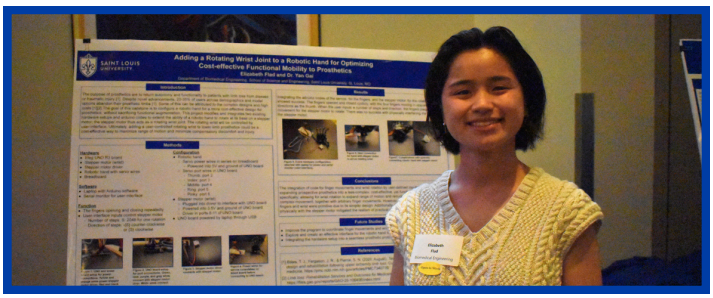
Join us in congratulating him on his success!

CONGRATULTIONS

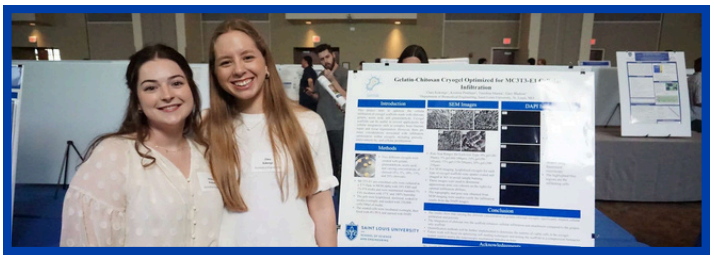
SSE SENIOR SHOWCASE

Each year, students from the SLU's School of Science and Engineering present the culmination of their senior design and research experiences at the highly anticipated Senior Design Showcase. This year's event, held on April 30, 2025, featured a wide array of impressive student projects that demonstrated technical excellence, creativity, and real-world impact. Students in Biomedical Engineering (BME) and Electrical and Computer Engineering (ECE) participate in a shared, interdisciplinary capstone course and form cross-departmental teams to tackle complex design challenges, which mirrors the kind of teamwork found in industry. To learn more about the projects featured in the 2025 Senior Design Showcase, click **here**. BME students are bolded below.

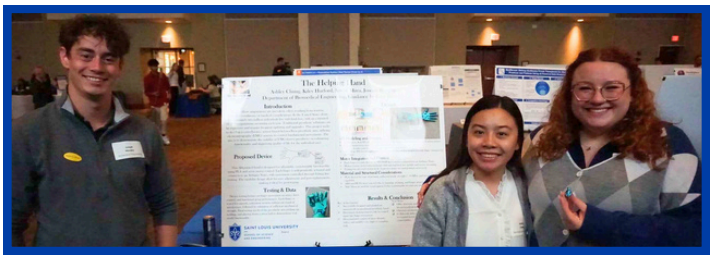
Cardinal Health NG Tube Test Environment **Harshith Gorla**, Alexis Lehmann, **Katherine Marino**, **Andrea Sedano**, **Aryana Yazdi**



Adding a Rotating Wrist Joint to a Robotic Hand for Expanding Functional Mobility of Lower-Arm Prosthetics - **Elizabeth Flad**



Cryofuse - **Clara Kokenge, Tanishaa Manna, Kristina Pinkham**

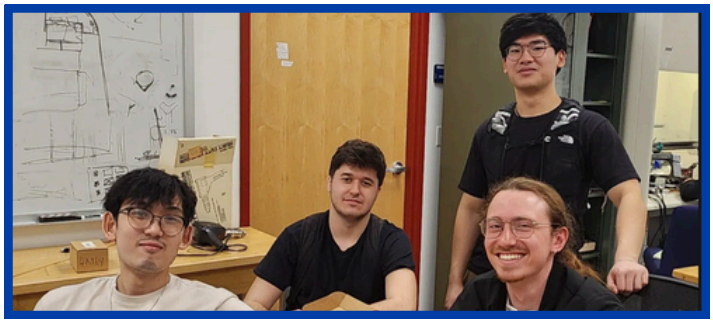


The Helping Hands **- Ashley Chung, Kiley Hurford, Srishti Mitra, Joseph Murphy**

Network Sniffer - Dylan Barrett, Joe Kohlberg, Nikolas Poholik, Robert Sloyan

Smart Water Bottle - Onaedo Adigwe, Tyler Ridgway, John Sullivan, Joe Williams

SENIOR SHOWCASE CONTINUED

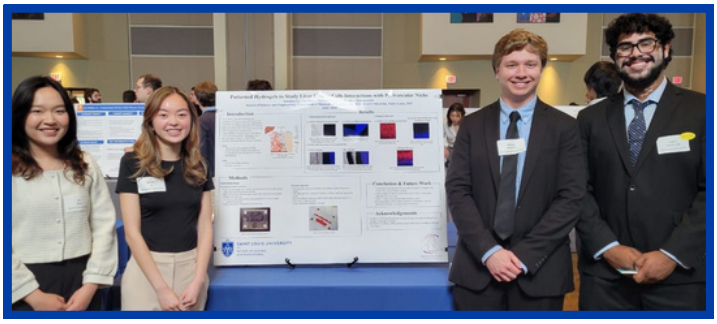


SafePace - Shane Grippi, Jason Nguyen, Keegan Pham, Foster Young

Tactile Avenue - Terrell Earl, Ben Elser, Praneeth Jasti, **Omari Wooldridge**

Dose of Genius - Severo Enriquez, Evan Hernandez, and Christine Honigfort

Ground Inclination Tool - Michael Buescher, **Julia Rooijakkers, Sean Schwetschenau, Libby Steilen**



Patterned Hydrogels To Study Cancer Cells **Annalise Le, Michael Pritchard, Van Phan, Raghav Yalamanchili**

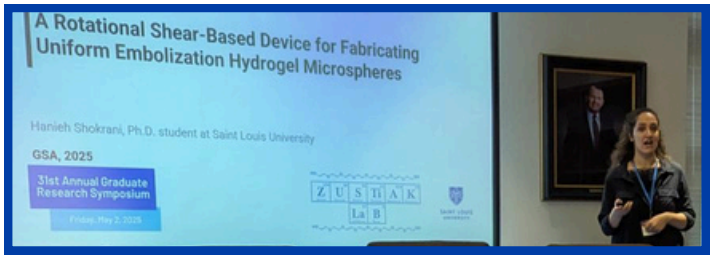
Augmented Exercise Accelerometer **Andrea Grisalez**, **Chris Lau**, **Stephen Le**, Adam Zabel - **Best BS BME/ECE Project**

Investigating Neuromuscular Crosstalk with a Tissue Culture Device - **Mia Ridolfo Best BS/MS BME/ECE Project**

SLU GRADUATE STUDENT ASSOCIATION SYMPOSIUM

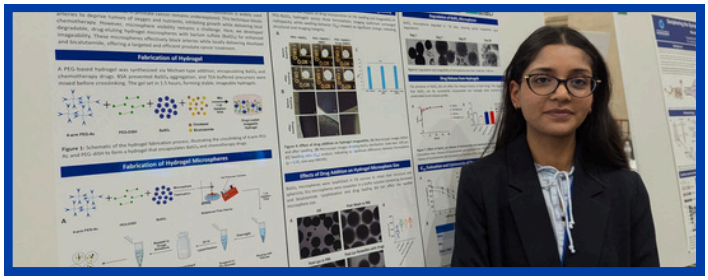
On May 2nd, SLU's Graduate Student Association (GSA) held its annual Research Symposium, showcasing the diverse work of SLU's graduate scholars and highlighting the vibrant research culture at SLU. To learn more, visit the GSA website **here**.

A. Jain, **A. Ridolfo**, M.M. Subramaniam, **D. Johnson**, **E. Pattan,** S. Babu, J. Kornbluth, **K. Garg**, "Investigating the Differential Effects of Hypoxic vs. Normoxic Mesenchymal Stem Cell Derived Extracellular Vesicles on Muscle Regeneration Following Volumetric Muscle Loss," (Oral Presentation)



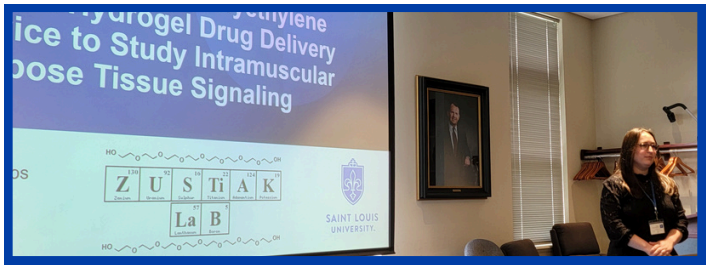
H. Shokrani, **S. Stealey**, **S. P. Zustiak**, "A Simple Rotational Shear-Based Device for Fabricating Hydrogel Microspheres to Treat Prostate Cancer Using Embolization," (Oral Presentation)

P. Hinkle, **F. Al Hasan Bin Enam**, **K. Garg**, **A. Reiter**, "Development of a Small Animal Device for Measuring In Vivo Muscle-Tendon Loading After Traumatic Injury,"(Oral Presentation)



F. Jamali, R. Ray, K. Pereira, **S. P. Zustiak**, "Imageable Microgels for Targeted Multi-Drug Delivery in Prostate Cancer Chemoembolization," (Poster Presentation)

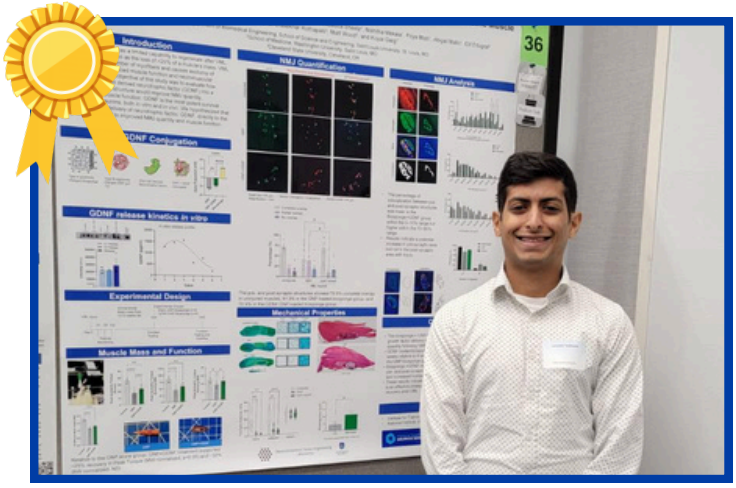
J. Tadiwala, C. Tobo, A. Ridolfo, M. Wood, **K. Garg**, "Neuromuscular Junction Preservation via GDNF-Infused Biosponges in a Rodent Model of Volumetric Muscle Loss," (Oral Presentation) **Award**: 2nd place in Life Sciences category



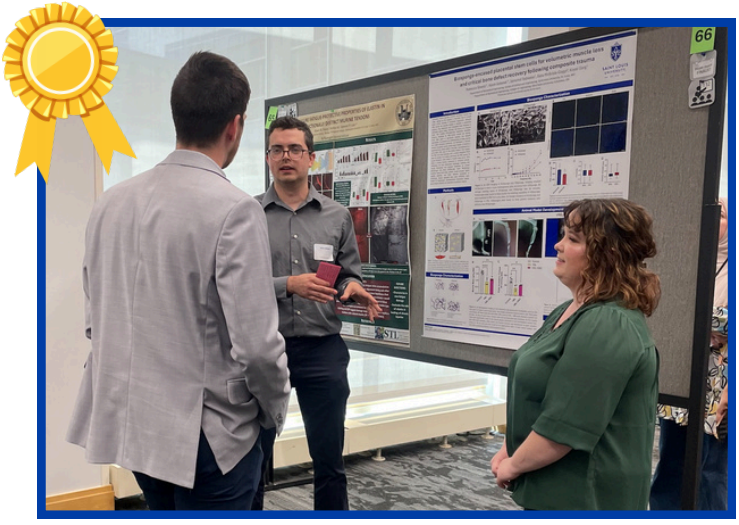
R. Boos, C. Gui, G. A. Meyer, **S. P. Zustiak**, "Development of Polyethylene Glycol Hydrogel Drug Delivery Device to Study Intramuscular Adipose Tissue Signaling," (Oral Presentation)

MUSCULOSKELETAL RESEARCH SYMPOSIUM AT WASHU

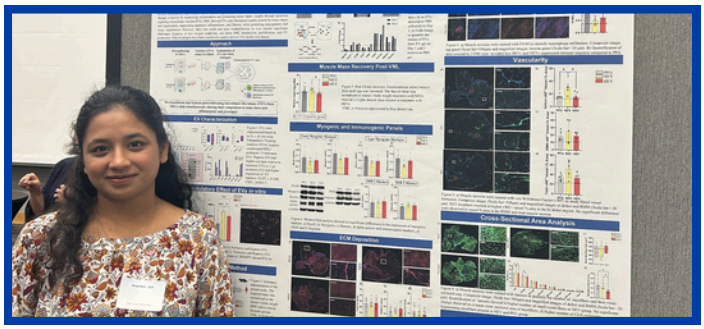
Students from the labs of **Dr. Garg** and **Dr. Reiter** presented at the 14th annual Musculoskeletal Research Center Symposium at Washington University in St. Louis on May 21st, 2025. The symposium is the largest and most extensive interaction of Musculoskeletal Research Center investigators.



J. Tadiwala, **C. Tobo**, **A. Ridolfo**, M. Wood, **K. Garg**, "Biosponges with Electrostatically Bound GDNF Enhances Neuromuscular Junction Quantity Following Volumetric Muscle Loss," (Poster and Oral Presentations - **Poster Award Finalist**)

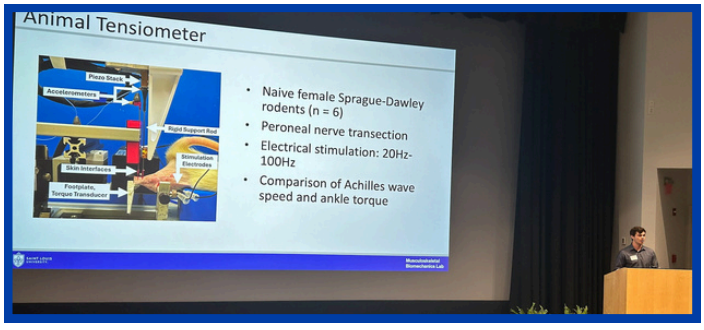


R. Sheetz*, K. Sekerak*, S. McBride-Gagyi, **K. Garg,** "Biosponge-Encased Placental Stem Cells for Volumetric Muscle Loss and Critical Bone Defect Recovery Following Composite Trauma," (**Poster Award Finalist**) **Authors Contributed Equally*



A. Jain, **A. Ridolfo**, M.M. Subramaniam, **D. Johnson**, **E. Pattan,** S. Babu, J. Kornbluth, **K. Garg**, "Investigating the Differential Effects of Hypoxic vs. Normoxic Mesenchymal Stem Cell Derived Extracellular Vesicles on Muscle Regeneration Following Volumetric Muscle Loss," (Poster Presentation)

A. Ridolfo, J. Tadiwala, A. Jain, K. Garg, "In vitro Modeling of Neuromuscular Crosstalk," (**Poster Award Finalist**)

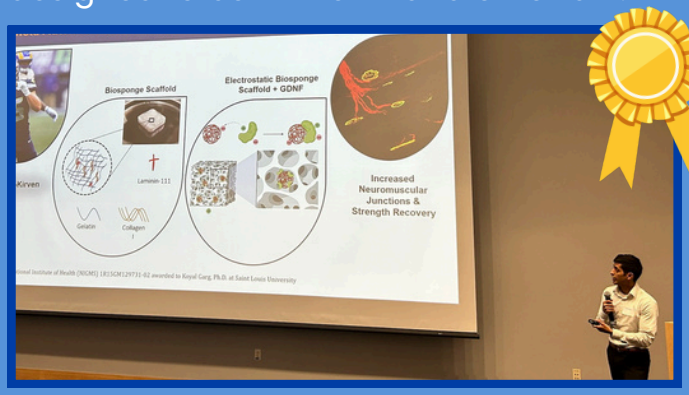


P. Hinkle, F. Al Hasan Bin Enam, K. Garg, A. Reiter, "Development of a Small Animal Device for In Vivo Measurement of Muscle-Tendon Loading," (Oral Presentation)

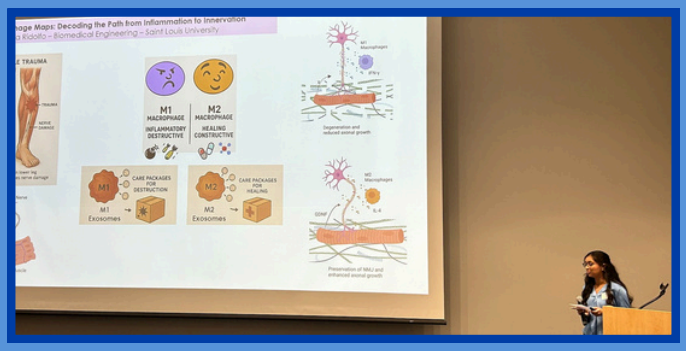
MUSCULOSKELETAL RESEARCH SYMPOSIUM AT WASHU CONT.

SCIENCE SLAM!

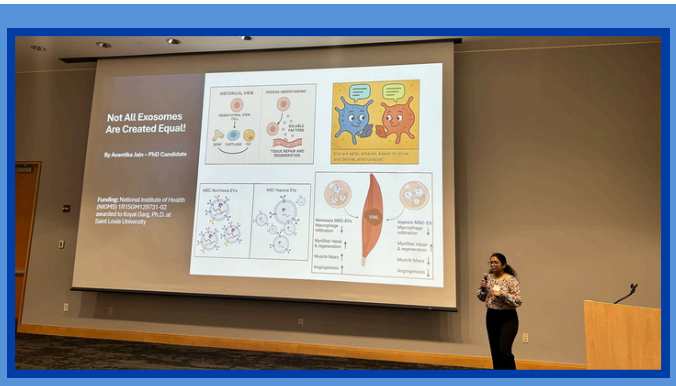
The recently added, "Science SLAM" category of the symposium required students to present a rapid fire talk designed to both inform and entertain.



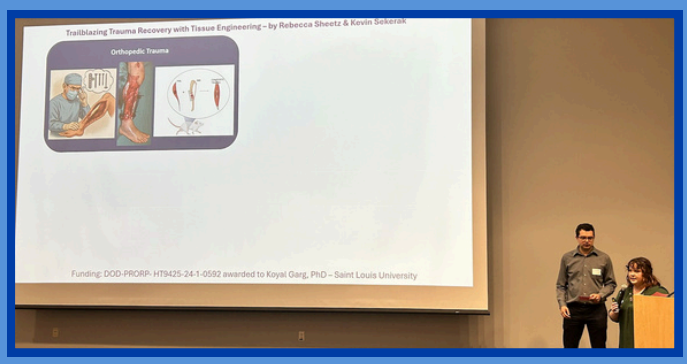
J. Tadiwala, C. Tobo, **A. Ridolfo**, M. Wood, **K. Garg**, "Scaffold Matchmaker: Reuniting Muscle with Its Nerve," (**Rapid Fire Talk Finalist**)



A. Ridolfo, J. Tadiwala, A. Jain, K. Garg, "Macrophage Maps: Decoding the Path From Inflammation to Innervation."



A. Jain, A. Ridolfo, M.M. Subramaniam**, D. Johnson, E. Pattan**, S. Babu, J. Kornbluth, **K. Garg**, "Not All Exosomes are Created Equal."



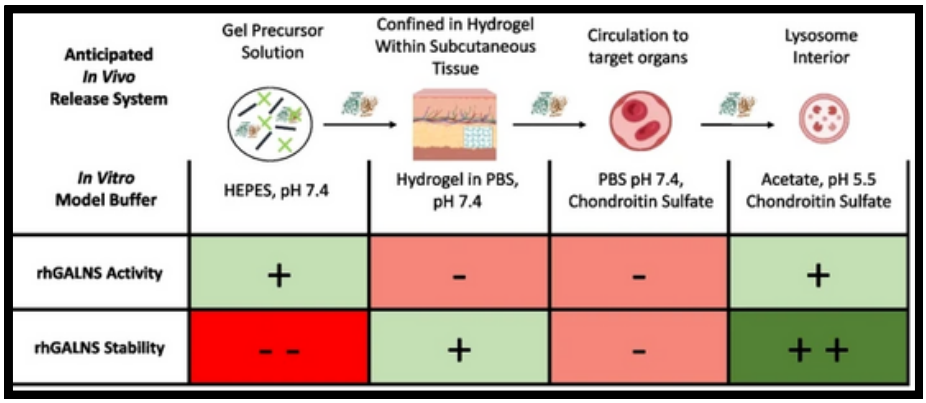
R. Sheetz*, K. Sekerak*, S. McBride-Gagyi**, K. Garg**, "Trailblazing Trauma Recovery with Tissue Engineering." **Authors contributed equally*

Dr. Koyal Garg, Associate BME Professor, served as abstract reviewer and moderator for one of the afternoon sessions.

SOFT TISSUE ENGINEERING LAB PUBLICATIONS

Recent BME Ph.D. grad from **Dr. Zustiak**'s lab, **Samuel Ruesing**, was the lead author of a recent article published in *Applied Biochemistry and Biotechnology*. The article, "rhGALNS Enzyme Stability in Physiological Buffers: Implications for Sustained Release," explored how encapsulating rhGALNS within the hydrogel improved its stability in conditions replicating human tissue, showing the device could deliver active enzyme for up to seven days. These results show that a sustained release device for rhGALNS is feasible despite the enzyme's poor stability. The project was a collaboration with the lab of Dr. Montaño (SLU Pediatrics).

Full author list: **Samuel Ruesing**, **Samuel Stealey**, Qi Gan, Linda Winter, *Adriana M. Montaño, ***Silviya P. Zustiak** (*co-corresponding authors)

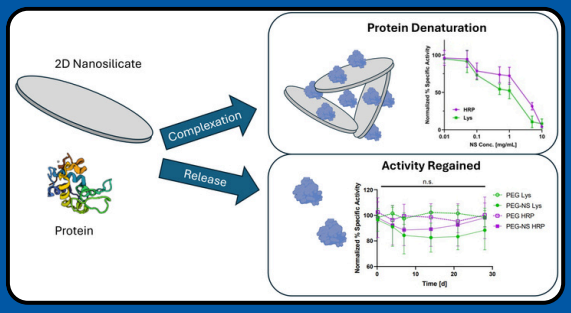


Click **here** to read the article.

Also out of **Dr. Zustiak**'s lab is an article in the latest edition of *Nanoscale*. Post doctoral research fellow, **Samuel Stealey, Ph.D.**, was the lead author of the article, "Protein Structure and Bioactivity Upon Adsorption and Desorption from Nanosilicate Sustained Release Delivery Devices."

Full author list: **Samuel Stealey**, **Ether Dharmesh**, Akhilesh K. Gaharwar, Jai S. Rudra, ***Silviya P. Zustiak**

The article investigated how nanosilicate particles interact with proteins to control their release from hydrogels and how this affects the proteins' structure and activity. Check it out **here.**



SOFT TISSUE ENGINEERING LAB PUBLICATIONS CONT.

Researchers in **Dr. Silviya Zustiak**'s lab recently collaborated with Dr. Jai Rudra, Biomedical Engineering Associate Professor at WashU. Their work was published in *Chemical Science*, the flagship journal of the Royal Society of Chemistry. The article titled, "Histidine-Rich Enantiomeric Peptide Coacervates Enhance Antigen Sequestration and Presentation to T cells," explores how specially designed peptides and their mirror-image forms can form liquid-like droplets to carry and deliver therapeutic molecules, highlighting their potential as customizable vaccine delivery systems. For a full author list and to read the article, click **here.**

WashU

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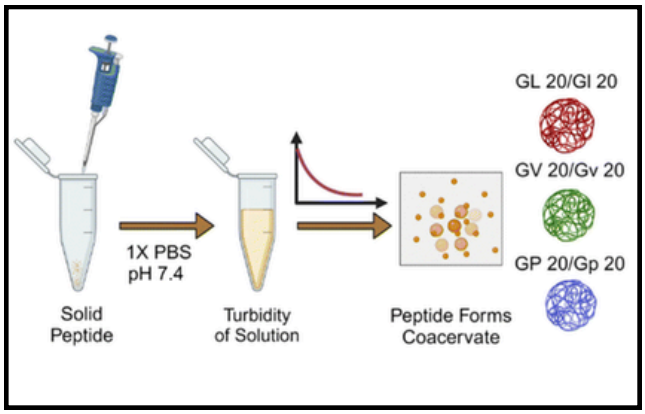
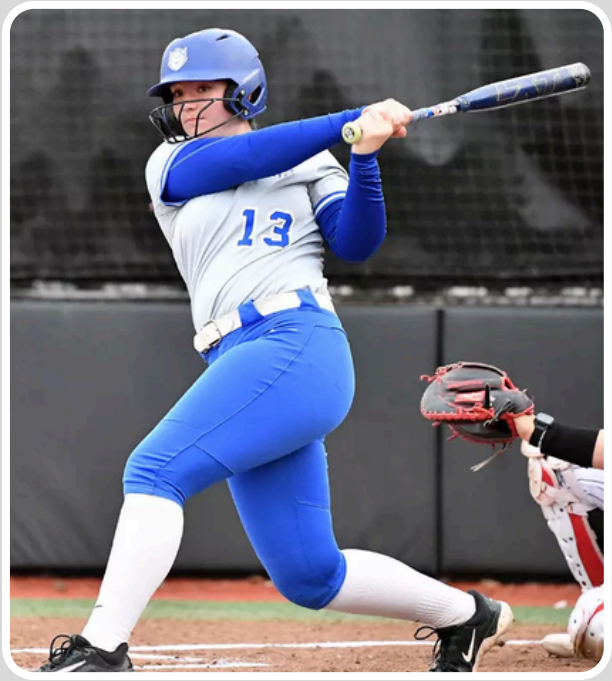


BME STUDENT NAMED A-10 CO-PLAYER OF THE YEAR



Biomedical Engineering rising senior, **Abigail (Abby) Mallo,** was recently named the Atlantic 10 Conference softball co-Player of the year. Mallo, a catcher from Oak Lawn Illinois, is the first player in the program history to earn this honor. She also earned the second All-Conference honor of her career, thanks in part to her performance as a power hitter this season. To read more about Abby's softball accomplishments, including setting SLU's career home run record, click **here**. Join us in congratulating Abby for her outstanding performance this season!

GRADUATE STUDENT EVENT - TOP GOLF

On Monday, May 6th, BME graduate students gathered at Top Golf's Midtown St. Louis location for a fun and well-earned break before finals. This final social event of the academic year was a hit, drawing strong attendance and plenty of laughter as students enjoyed hitting golf balls, great food, and each other's company. Thanks to everyone who came out and made the event a memorable send-off to the semester!

2025 COMMENCEMENT

SLU School of Science and Engineering students attended the 2025 Pre-commencement Ceremony on May 16, 2025. Congratulations to all our seniors and graduate students for their hard work and accomplishments. BME wishes everyone the best in their future academic and career endeavors!

BME BS Graduates

BME BS Graduates pose with Dr. Blesdoe, Dr. Zustiak, and Dr. Case

BME Graduate Students who have defended or will defend this summer. L to R: James Baker (MS), Patrick Hinkle (MS), Jakeh Orr (PhD), Samuel Ruesing (PhD).

BME Faculty L to R: Drs. Koyal Garg, Silviya Zustiak, Natasha Case and Alex Reiter

BME BS Graduates pose with Dr. Garg

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 BME ALUMNI

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

Did someone forward you this newsletter? Click **here** to be added to our distribution list.

Receiving this newsletter for the first time? Click **here** to read news from previous months.