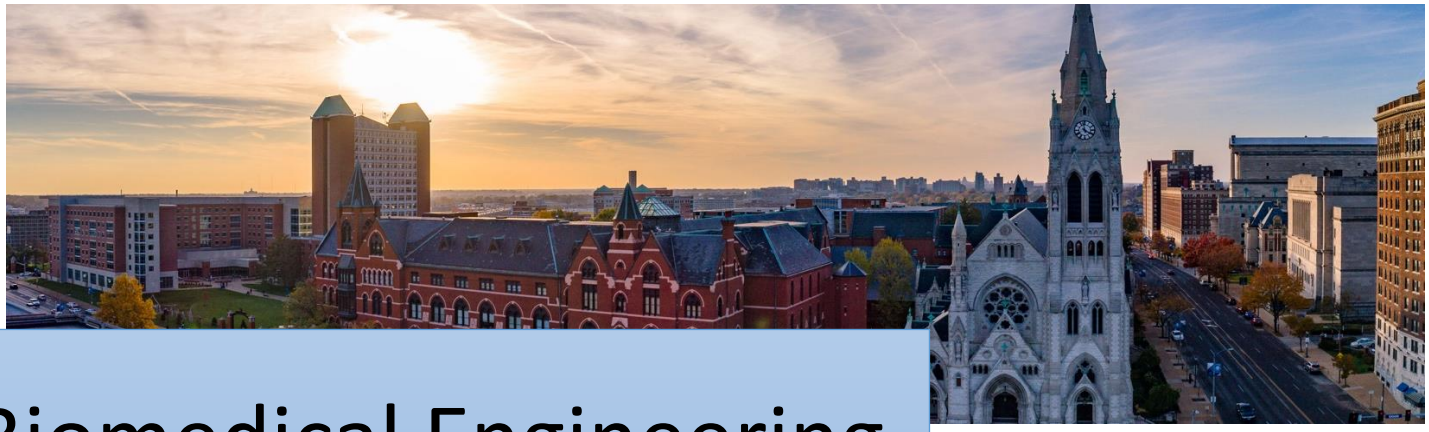

Biomedical Engineering

Graduate Program Newsletter

School of Science and Engineering | Saint Louis University

Promotions and Appointments

Scott Sell, Ph.D., was promoted to full professor effective July 1st, and moved into the role of Associate Dean of Undergraduate Education in the new SSE. Congratulations Prof. Sell!

Gary Bledsoe, Ph.D., was appointed BME Department Chair effective July 1st.

Silviya Zustiak, Ph.D. was appointed BME Associate Chair effective July 1st.

Awards and Honors

Koyal Garg, Ph.D., was awarded the Outstanding Graduate Faculty Award from Parks College of Engineering, Aviation and Technology.

Samuel Stealey, Ph.D. student in Dr. Silviya Zustiak's Soft Tissue Engineering Lab, won Outstanding Graduate Student Award for a PhD student from Parks College of Engineering, Aviation and Technology.

Jeffrey Au, Master's student in Dr. Koyal Garg's Musculoskeletal Tissue Engineering Lab, won Outstanding Graduate Student Award for an MS student from Parks College of Engineering, Aviation and Technology.

Research Funding

Koyal Garg, Ph.D. will serve as a co-I with PI Dr. Jonathan Fisher on an NIH R15DK132727 grant titled "Insulin sensitivity in skeletal muscle".

Scott Sell, Ph.D., in collaboration with Scott Martin from Chemistry and Hank Kaplan and Niloofar Piri from Ophthalmology, were awarded an Allied Health Sciences Research Grant for "Development of a flow culture system for analysis and re-establishment of glucose transport in RPE cells for retinitis pigmentosa treatment".

Silviya Zustiak, Ph.D., was awarded the Parks College Competitive Research Grant for her project "Development and Testing of Injectable Super-Lubricious Microgels".

Silviya Zustiak, Ph.D. and **Koyal Garg,** Ph.D. are preceptors on a National Institutes of Health T32GM141602-01A1 "Pharmacological Sciences Training Grant", Pls: Terrance Egan, Gina Yosten, John Walker.

Emily Luc, MS student co-advised by Dr. Zustiak and Dr. Kuljanishvili (Physics), was awarded the Investigative Learning Experience (ILEX) grant for her project on "Cell Proliferation on Chemical Vapor Deposition Grown Carbon Nanotube/Zinc Oxide Nanowire Heterostructures".

Publications in 2022

Bruns, J., Egan, T., Mercier, P. and ***Zustiak**, S.P., 2022. Glioblastoma spheroid growth and chemotherapeutic responses in single and dual-stiffness hydrogels. *Acta Biomaterialia*, in press.

Dunn, A., Haas, G., Madsen, J., Ziemkiewicz, N., Au, J., Johnson, D., West, C., Chauvin, H., Gagyi, S.M. and ***Garg, K.**, 2022. Biomimetic sponges improve functional muscle recovery following composite trauma. *Journal of Orthopaedic Research®*, *40*(5), pp.1039-1052.

Kader, M.S., Weyer, C., **Avila, A.**, **Stealey, S.**, **Sell, S.**, **Zustiak, S.P.**, *Buckner, S., *McBride-Gagyi, S. and *Jelliss, P.A., 2022. Synthesis and Characterization of BaSO4–CaCO3–Alginate Nanocomposite Materials as Contrast Agents for Fine Vascular Imaging. *ACS Materials Au,* in press.

Mahmoudi, M., Jennings, C., Pereira, K., **Hall, A.F.** and *Arzani, A., 2022. Guiding the prostatic artery embolization procedure with computational fluid dynamics. *Journal of Biomechanical Engineering*, in press.

Yu, C., Sacris, J., **Gai, Y.** and *Lei, C.H., 2022. 3D finite-element modeling of air-cell-based cushions and buttock tissues during prolonged sitting. *Computers in Biology and Medicine*, p.105229.

Ziemkiewicz, N., Hilliard, G.M., Dunn, A.J., Madsen, J., Haas, G., Au, J., Genovese, P.C., Chauvin, H.M., **West, C., Paoli, A.** and **Garg, K.**, 2022. Laminin-111-Enriched Fibrin Hydrogels Enhance Functional Muscle Regeneration Following Trauma. *Tissue Engineering Part A,* in press.

Stealey, S., Khachani, M. and ***Zustiak, S.P.,** 2022. Adsorption and Sustained Delivery of Small Molecules from Nanosilicate Hydrogel Composites. *Pharmaceuticals*, 15(1), p.56.

Vogt, K., Aryan, L., Stealey, S., Hall, A., Pereira, K. and ***Zustiak, S.P.**, 2022. Microfluidic fabrication of imageable and resorbable polyethylene glycol microspheres for catheter embolization. *Journal of Biomedical Materials Research Part A*, 110(1), pp.131-142.

Hixon, K.R., Eberlin, C.T., Pendyala, M., Alarcon de la Lastra, A. and ***Sell, S.A.**, 2022. Scaffolds for Use in Craniofacial Bone Regeneration. In *Craniofacial Development* (pp. 223-234). Humana, New York, NY.

Symposium and Conference Awards

David Johnson, Ph.D. student in Dr. Garg's lab, won 3rd place in the Biological Sciences category at the Annual Graduate Student Association research symposium for his poster "Regenerative Rehabilitation for Enhancing Muscle Recovery Following Volumetric Muscle Loss".

Samuel Stealey, Ph.D. student in Dr. Zustiak's lab, won 1st place in the Physical Sciences category at the Annual Graduate Student Association research symposium for his oral presentation "Development of Nanosilicate-Hydrogel Composites for Sustained Delivery of Charged Biopharmaceutics".

Samuel Stealey, Ph.D. student in Dr. Zustiak's lab, won 2nd place in the Graduate Physical Sciences category at the Sigma Xi Symposium for his rapid-fire presentation "Development of Nanosilicate-Hydrogel Composites for Sustained Delivery of Charged Biopharmaceutics".

Jeffrey Au, MS student in Dr. Garg's lab, won 2nd place in the Graduate Biological and Life Sciences Category at the Sigma Xi Symposium for his rapid-fire presentation on "Biomolecular response of

traumatized skeletal muscle to electrically stimulated eccentric contraction training".

Hannah Chauvin, MS Student in Dr. Garg's lab, won 1st place in the Graduate Biological and Life Sciences category at the Sigma Xi Symposium for her rapid-fire presentation on "Effects of electrically stimulated eccentric contraction training on macrophage phenotype and neuromuscular junction remodeling".

Charles West, MS student in Dr. Garg's lab, won 1st place in the Graduate Physical Sciences and Engineering category at the Sigma Xi Symposium for his rapid-fire presentation "Immunomodulatory biosponges for volumetric muscle loss".

Charles West, MS student in Dr. Garg's lab, won 3rd place in the Biological Sciences category at Annual Graduate Student Association research symposium for his oral presentation on "Immunomodulatory biosponges for volumetric muscle loss".

Ether Dharmesh, undergraduate researcher in Dr. Zustiak's lab, won 2nd place for the best rapid-fire presentation and best poster honorable mention in the Undergraduate Physical Sciences category at the American Society for Biochemistry and Molecular Biology Annual Meeting/Experimental Biology Meeting in Philadelphia, PA. Her presentation was titled "Microfluidic Fabrication and Characterization of Radiopaque Barium Sulfate Polyethylene Glycol-Based Hydrogel Microspheres".

Recent Graduates

Joseph Bruns, advisor Silviya Zustiak, successfully defended his Ph.D. dissertation "Effect of Matrix Presence and Properties on Glioblastoma Cell Response to Chemotherapeutics" on April 14.

Maddie Andres, advisor Scott Sell, successfully defended her MS thesis "A Technique for Controlled Anisotropy in Chitosan - Gelatin Cryogels for use in Bone Tissue Engineering" on June 1.

Jeffrey Au, advisor Koyal Garg, successfully defended his MS thesis "Biomolecular Response of Traumatized Skeletal Muscle to Electrically Stimulated Eccentric Contraction Training" on April 21.

Katelyn Caviness, advisor Andy Hall, successfully defended her MS thesis "Fabrication and Characterization of Radiopaque Microspheres for Prostate Cancer Chemoembolization" on May 5.

Hannah Chauvin, advisor Koyal Garg, successfully defended her MS thesis "Impacts of Electrically Stimulated Eccentric Contraction Training on Innervation and Cellular Phenotype in Injured Muscles" on April 19.

Allison Paoli, advisor Koyal Garg, successfully defended her MS thesis "Mesenchymal Stem Cell Exosomes for Skeletal Muscle Regeneration following Trauma" on May 3.

Charles West, advisor Koyal Garg, successfully defended his MS thesis "Delivery of Pharmaceutical Agents using Biomimetic Sponges for the Treatment of Musculoskeletal Trauma" on May 4.