



The School of Biomedical Engineering (SBME) is built on strong faculty and research programs in the colleges of Engineering, Veterinary Medicine and Biomedical Sciences, Natural Sciences, and Health and Human Sciences. Faculty display academic excellence across diverse fields converging on many research areas, including:

Regenerative and Rehabilitative Medicine

Much work in SBME focuses on the study of orthopaedics ranging from horses to humans. Clinical relevance stretches from spinal mechanics and disc replacements, to arthritis and joint functions that include legs and hips. Stem cells, biologics, and small molecules are all on the list of novel approaches to problems in regenerative medicine.

Research interests include materials for tissue engineering, biomimetic nitric oxide materials, orthopaedic biomechanics, stem cell therapy, and cartilage regeneration. [Faculty members focusing on regenerative & rehabilitative medicine.](#)



Medical Devices and Therapeutics

Significant research in SBME focuses on the study of materials that modify surfaces used for medical devices. This can range from modifications to materials that carry fluids and need special properties (e.g. anti-coagulant) to the modification of materials that are used in implants of things that range from joints to heart valves. Extensive expertise in biochemical engineering further helps expand syntheses to potential molecular therapeutics.



Research interests include biomedical image and signal processing, cardiovascular mechanics, equine orthopedics, and polymeric biomaterials. [Faculty members focusing on medical devices and therapeutics.](#)

Imaging and Diagnostics

Imaging and diagnostics in SBME revolves around the development of a new generation of novel biosensors incorporating everything from lab-on-a-chip technologies to the use of lasers and optics in state-of-the-art microscopy. The range of targets runs from ions crossing channels in membranes detected electrophysiologically to oxidizable molecules detected by electrochemistry or larger peptides or proteins detected by immunochemistry. Additional approaches including aptamers on one end and various forms of spectroscopy on another are in constant development.

Research interests include biosensors, electrical impedance, and lab-on-a-chip technology. [Faculty members focusing on imaging and diagnostics.](#)