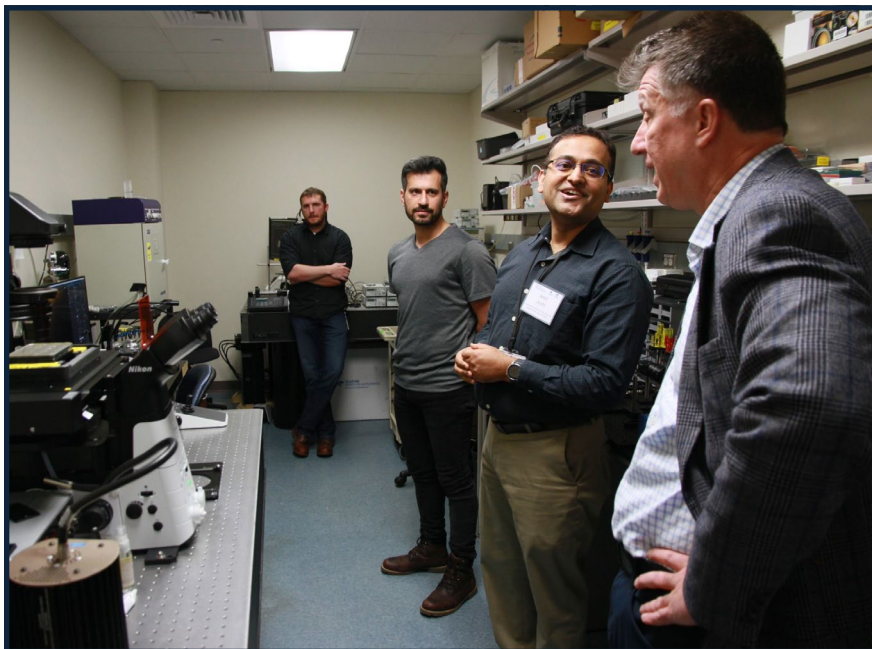


ROUNDING WITH THE DEAN

Rounding with Joseph E. Kerschner, MD
Provost and Executive Vice President, The Julia A. Uihlein, MA, Dean of the School of Medicine

Knowledge changing life in the Joint Department of Biomedical Engineering



On December 9, 2022, I rounded in the Joint Department of Biomedical Engineering with Frank A. Pintar, PhD, Founding Chair and Kern Professor, Joint Department of Biomedical Engineering. This unique department is a collaboration between Marquette University and the Medical College of Wisconsin and is dedicated to delivering an extraordinary educational experience designed to empower the next generation of biomedical engineers, scientists and physicians. Dr. Pintar invited faculty members to discuss topics including cardiovascular and tissue regenerative engineering, Biophotonics, computational systems biology, sensory neuroscience, attention and perception and nanomedicine with image-guided interventions.

Drs. Frank Pintar and Amit Joshi, PhD, Associate Professor, and Vice Chair for Clinical and Research Affairs, kicked off our time together by providing a departmental overview. They shared that in the 2021-2022 academic year, the program awarded six masters and four PhD degrees. The department has received some new grants including awards to Drs. Dash, Greenberg, Joshi, Pintar, Stemper and Tefft which collectively brought in \$1.5 million to MCW, while two new grants were awarded to

By the Numbers:

Joint Department of Biomedical Engineering

53 enrolled graduate
students

21 primary faculty members

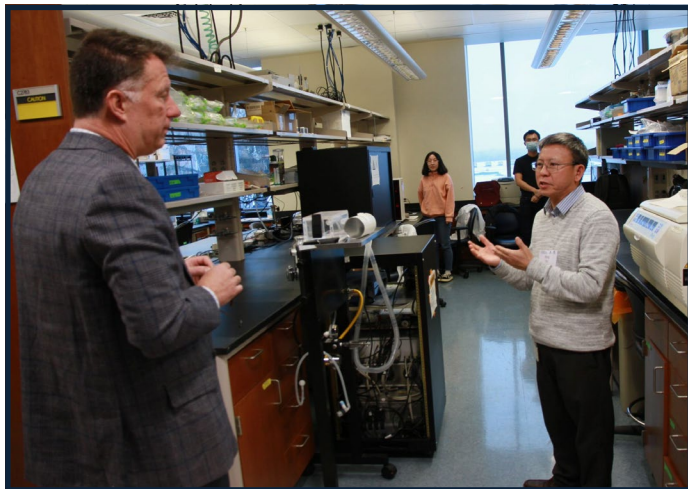
51 active research awards

60+ clinical collaborators

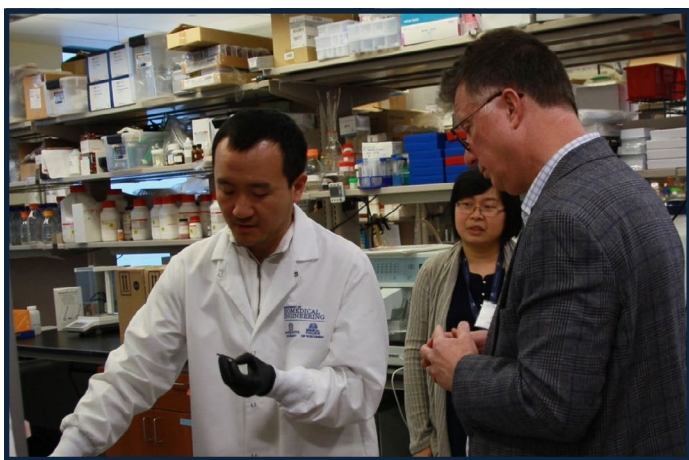
Drs. Schmit and Yu which collectively brought in about \$1 million to Marquette University. Additionally, they shared the department's priority of connecting clinical applications to departmental research themes. [Read more about this on their website: Research Tracks/Clinical Applications.](#)

Our first stop was at the laboratory of Brandon Tefft, PhD, Assistant Professor. Dr. Tefft's lab is focused on developing next-generation treatments for cardiovascular diseases. Their strategy is to develop living tissue replacements using regenerative engineering and biomedical nanotechnology approaches. His lab is particularly interested in developing living blood vessels, cardiac valves, vascular patches, and cardiac patches to address the needs of patients suffering from coronary heart disease, valvular heart disease, vascular disease, and congenital heart disease.

Next, I visited with Bo Wang, PhD, Assistant Professor, at the Tissue Regenerative Engineering (TRE) Laboratory. Her team develops biomaterials and nanotechnology for regenerative engineering, tissue engineering, and drug delivery applications. Research at the TRE Lab can be classified into three areas: stem cell engineering; hard and soft tissue engineering and 3D bioprinting; and cardiovascular tissue engineering, imaging, modeling, and simulation.



After learning from Dr. Yu, I met with Dr. Ranjan Dash, PhD, Professor Computational Systems Biology Lab. Research in the lab uses signal- and system-engineering methodologies, in conjunction with experimental measurements, to develop multi-scale mechanistic computational models. These models will further the quantitative and integrated understanding of the biophysical and biochemical operations of a variety of biological/physiological systems and guide engineering-based manipulations of the same.



I visited with Bing Yu, PhD, Associate Professor, and his lab, where they are developing innovative optical devices that are compact, accurate, reliable, and cost-effective, with applications for cancer detection and therapeutic monitoring. They shared that their research is especially vital in low- and middle-income countries.





I headed over to visit Adam S. Greenberg, PhD, Assistant Professor in his Sensory Neuroscience, Attention, & Perception Lab where they study the neurobiology of attention and perception in the visual, auditory, & olfactory domains to understand how human behavior is guided by the world we perceive. They use psychophysical and neuroimaging methods including fMRI, TMS, DSI and computational modeling.

Closing the rounding, the last stop was the Nanomedicine & Image-Guided Interventions Lab run by Amit Joshi, PhD. This lab encompasses multiple research areas including fundamental investigations of near-infrared and shortwave infrared light transport in tissue, development of novel imaging and light-triggered therapeutic nanoparticles, and the integration of optical and multimodal imaging and remotely triggered nanotechnologies into clinical image-guided intervention workflows. The overall objective of these methods is to develop minimally invasive and non-toxic diagnostic and therapeutic technologies directed at cancer, pulmonary and infectious disease, and other vascular pathologies.



“ The joint department of biomedical engineering is a phenomenal example of the incredible things that happen when collaboration and teamwork are prioritized. ”

Dr. Pintar and his team did an outstanding job planning this meeting. It was very rewarding to learn about the Department's contributions to education and learn about their collaboration with our partners at Marquette University. I want to extend my sincere thanks and appreciation to all the presenters, especially the students who shared their unique projects.