UF CrossLink
BIOMEDICAL ENGINEERING at the UNIVERSITY of FLORIDA FALL 2026



- BUILDING BETTER BENCHTOP MODELS
- BEDSIDE TO BENCH AND BACK
- PERSONALIZED, AI-SUPPORTED HEALTHCARE

THE FUTURE OF DISCOVERY

BIOMEDICAL ENGINEERS ARE USING *NEW APPROACH METHODOLOGIES (NAMS)* TO RESHAPE HOW WE MODEL DISEASE AND DEVELOP THERAPIES.

LOOKING AHEAD

Next year, we proudly celebrate the **department's 25th Anniversary**–a milestone that honors 25 years of dedication, innovation and service. We look forward to celebrating this special occasion with the entire UF BME community throughout the year.

Stay tuned for anniversary events and special features!



MESSAGE FROM THE CHAIR

Dear alumni and friends,

I am delighted to share the 2026 edition of CrossLink, highlighting another remarkable year of discovery, achievement and impact across the J. Crayton Pruitt Family Department of Biomedical Engineering.

This year's cover story, "The Future of Discovery," highlights new approach methodologies, or NAMs, and the ways our faculty are developing increasingly human-relevant approaches to understanding health and disease. From engineered tissues and biomaterials to computational models, artificial intelligence, advanced imaging and other emerging technologies, these approaches are helping researchers ask better questions, build better models and move promising discoveries closer to clinical translation. The work featured in these pages reflects one of UF BME's greatest strengths: bringing engineering, biology and medicine together to address complex challenges in human health.

That spirit of innovation extends throughout this issue. We highlight advances in cancer research, celebrate the achievements of our students and showcase the many ways they are gaining hands-on experience through research, design and collaboration.

We are especially grateful for the generosity of Jerry Chang, David Szalay and Virginia "Ginny" Szalay, co-founders of Samaritan Biologics, whose support established the Chang & Szalay Samaritan Biologics Endowed Professorship in Biomedical Engineering. Dr. Wesley Bolch was named its inaugural recipient. This investment in our faculty reflects a shared commitment to excellence in research, education, mentorship, leadership and service, values that strengthen our department and extend its impact well beyond the university.

As I reflect on the stories in this issue, I am struck by how closely connected these accomplishments are. Faculty discovery creates new opportunities for students. Alumni and friends help create pathways for education, mentorship and innovation. Collaborations across disciplines move ideas from fundamental research toward meaningful applications. Together, these efforts continue to strengthen the environment that makes UF BME such a dynamic place to learn, discover and lead.

We are also beginning to look ahead to an important milestone. In 2027, the department will celebrate its 25th anniversary, offering an opportunity to reflect on the deep roots of our department and the transformative support of the Pruitt family, whose generosity helped shape the department we know today. As we look to the next 25 years, I am deeply grateful to the faculty, students, alumni, staff, partners and friends who continue to shape our future.

Thank you for being part of the UF BME community. I hope you enjoy this year's CrossLink and the stories of people and ideas moving biomedical engineering forward.

Sincerely,

Cherie Stabler
J. Crayton Pruitt Family & UF Foundation Preeminence Professor and Department Chair

UF Herbert Wertheim College of Engineering
J. Crayton Pruitt Family Department of Biomedical Engineering
UNIVERSITY *of* FLORIDA

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CELEBRATING STUDENT SUCCESS

PRUITT LEGACY IN ACTION

THREE RISING FACULTY MEMBERS NAMED PRUITT FAMILY ENDOWED FACULTY TERM FELLOWS, RECOGNIZING EXCELLENCE IN TEACHING AND RESEARCH

The fellowships recognize rising junior faculty who demonstrate excellence in teaching, mentorship and research, continuing the Pruitt family's legacy of investing in the people shaping the future of biomedical engineering at UF.

Faculty members May Mansy, Ph.D., Ana Maria Porras, Ph.D., and Brittany Taylor, Ph.D., have been selected as Pruitt Family Endowed Faculty Term Fellows in the J. Crayton Pruitt Family Department of Biomedical Engineering.



MAY MANSY, PH.D.

ADVANCING ENGINEERING EDUCATION

Mansy, an instructional associate professor and director of peer learning and mentoring, has founded and led several student-focused initiatives, including the BME Learning Assistant Program and BMEntor Program, which together have supported more than 3,500 students.

She has taught more than 1,000 undergraduate students while implementing pedagogy-driven instructional practices and consistently maintaining exceptional teaching evaluations. Her work has also advanced the scholarship of teaching and learning in biomedical engineering education, helping strengthen how students learn, collaborate and support one another.

Her honors include the UF BME Faculty Teaching Excellence Award, Herbert Wertheim College of Engineering Teacher of the Year Award and UF BME Faculty Service Award.



ANA MARIA PORRAS, PH.D.

ENGINEERING AT THE MICROBIOME–ECM INTERFACE

Porras, an assistant professor, leads a research program exploring how microbes interact with the human extracellular matrix and contribute to disease. Her work brings together engineering and microbiology to better understand these complex interactions and their role in human health.

Since joining UF in 2021, her lab has secured more than $2.4 million in federal funding, including an NIH MIRA Award and NSF CAREER Award. She has also built a strong record of public engagement, sharing biomedical engineering research with audiences beyond the laboratory.

Her work has earned national recognition through honors including the AAAS Early Career Award for Public Engagement with Science and multiple Rising Star awards.



BRITTANY TAYLOR, PH.D.

ADVANCING MUSCULOSKELETAL ENGINEERING

Taylor, an assistant professor, leads a nationally recognized research program focused on orthopaedic regenerative engineering and tendon healing. Her research seeks to better understand tissue repair and develop engineering approaches that can improve healing and recovery.

Since joining UF in 2021, her work has resulted in 16 peer-reviewed publications and provisional patents, with support from the National Institutes of Health, an NSF CAREER Award, the Burroughs Wellcome Fund and the Alliance for Regenerative Rehabilitation and Training.

Her growing research portfolio is complemented by a strong commitment to education, mentorship and community engagement. She recently received an NIH K12 Career Development Award and the UF BME Faculty Teaching Excellence Award.

"The selection committee had the difficult task of choosing only three fellows from an outstanding pool of applicants," said Cherie Stabler, Ph.D., professor and chair of the J. Crayton Pruitt Family Department of Biomedical Engineering. "These faculty members truly exemplify the innovation, dedication and impact that define UF BME."

CHANG, SZALAYS ESTABLISH ENDOWED PROFESSORSHIP TO ADVANCE BIOMEDICAL ENGINEERING AT UF

NEW PROFESSORSHIP WILL RECOGNIZE FACULTY EXCELLENCE IN RESEARCH, EDUCATION AND SERVICE



Jerry Chang, Samaritan Biologics managing partner and COO

Jerry Chang and his business partners, David and Virginia "Ginny" Szalay, co-founders of Samaritan Biologics, have established the Chang & Szalay Samaritan Biologics Endowed Professorship in Biomedical Engineering at the University of Florida.

The endowed professorship will support a faculty member in the J. Crayton Pruitt Family Department of Biomedical Engineering within UF's Herbert Wertheim College of Engineering.

Created in alignment with Samaritan Biologics' mission of advancing innovative medical treatments while supporting community engagement and philanthropy, the professorship seeks to recognize a faculty member who demonstrates exceptional achievement in biomedical engineering and a strong commitment to service and leadership.

"We wanted this professorship to support faculty who not only advance biomedical engineering through outstanding research, but who are also committed to education, mentorship and service. Those values are central to Samaritan Biologics and to the kind of impact we hope to make. UF BME has been an important part of my professional community, and Ginny, David and I are proud to support the faculty who will help shape the future of the field," said Jerry Chang, managing partner of Samaritan Biologics.

The professorship reflects the values that have shaped Chang's career. With more than 20 years of experience in technology development and commercialization, he has held leadership roles in operations, product development, quality assurance and regulatory affairs, including work involving surgical implants, sterilization technologies and biological materials.

Chang co-founded Samaritan Biologics with the Szalays with a focus on providing biologic products while incorporating philanthropy into the company's mission. Samaritan Biologics donates 10% of its annual profits to medically focused charitable organizations.

Chang also has longstanding ties to UF BME. He is a standing member of the department's External Advisory Board, where he provides industry perspective and guidance.

"We are deeply grateful to Jerry, David and Ginny for this meaningful investment in our faculty and in the future of biomedical engineering at UF. What makes this professorship especially significant is its recognition of excellence across research, education and service. Those are all essential to our mission, and this support will help our faculty continue to advance innovative research, mentor the next generation of biomedical engineers and make an impact well beyond the university," said Cherie Stabler, chair of UF BME.



INAUGURAL RECIPIENT

Wesley E. Bolch Named Endowed Professor

Distinguished Professor Wesley E. Bolch, Ph.D., has been named the inaugural Chang & Szalay Samaritan Biologics Endowed Professor in Biomedical Engineering.

Bolch was selected for his excellence in research, education, mentorship and service, as well as his leadership in medical and health physics. His research focuses on optimizing the use of ionizing radiation in medical imaging and cancer treatment while minimizing radiation-related risks to healthy tissue.

A triple Gator and longtime UF faculty member, Bolch directs UF's Advanced Laboratory for Radiation Dosimetry Studies and has helped advance patient-specific radiation dosimetry and computational models used in medical imaging and cancer therapy.

"I very much look forward to using this professorship to further my endeavors in teaching, research and service," Bolch said.

THE FUTURE OF DISCOVERY

BIOMEDICAL ENGINEERS ARE USING NEW APPROACH METHODOLOGIES TO RESHAPE HOW WE MODEL DISEASE AND DEVELOP THERAPIES.

NAMS

New Approach Methodologies (NAMs) are innovative research tools and models that enhance how scientists study human biology and disease by delivering new insights that can complement or even replace more traditional methods.

At the University of Florida, biomedical engineers are pioneering NAMs by integrating engineering, biology and data science to accelerate discovery, personalize medicine and improve patient outcomes.

> UF BME labs are at the forefront of creating and refining NAMs, with a long-standing focus on human-centered design and on leveraging new technologies to build better tools and models."
>
> **CHERIE STABLER**

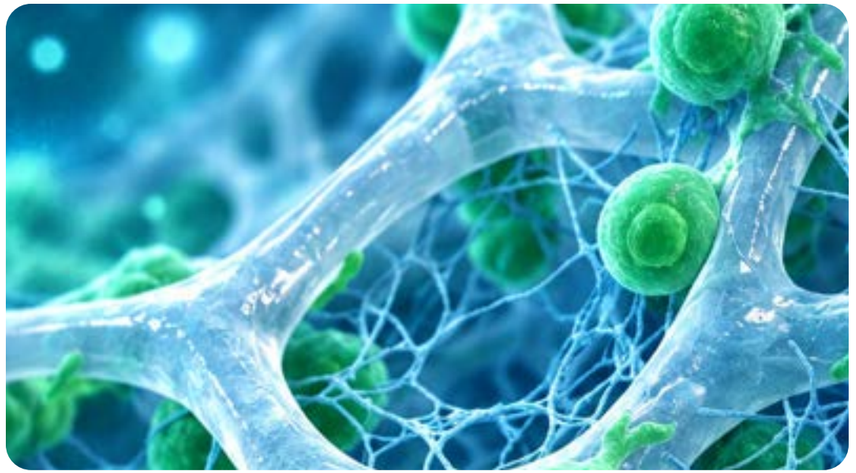
WHY NAMS? A SMARTER WAY FORWARD

GREATER HUMAN RELEVANCE
Creating new human-centered models delivers new insight into human physiology.

BETTER PREDICTION
Accounting for human variability can improve predictions of disease and treatment response.

GREATER EFFICIENCY
Better models can identify promising therapies and rule out ineffective approaches earlier.

ACCELERATING INNOVATION
New technologies can streamline research and move promising treatments toward patients faster.



A NEW PARADIGM AT THE INTERSECTION OF ENGINEERING AND BIOLOGY

The study of the human body has dramatically changed in the last decade. Advances in genomic and proteomic techniques provide unprecedented insight into the complexity of the human cell. Transformative tools such as genome editing and stem cell generation allow researchers to study personalized human cells in a dish. At the same time, improvements in computational tools and computing power have revolutionized our capacity to interpret complex datasets.

NAMs seek to capture these converging technologies to deliver new, highly personalized insights into human physiology and pathology, and to identify and screen new therapeutics and interventions.

Biomedical engineers are uniquely positioned to lead NAM development, as they thrive at the intersection of engineering and biology. From designing microphysiological systems to building clinically data-driven models, we transform cutting-edge science into tools that seek to deliver better predictions and faster, more effective therapies for patients.

THREE WAYS UF BME IS ADVANCING NAMS

01

BUILDING BETTER BENCHTOP MODELS

Leveraging new technologies in human cell culture, microfluidics, and biomaterial design, researchers are engineering advanced human-relevant benchtop systems that more accurately mimic tissue function and disease.

02

PERSONALIZED AI-SUPPORTED HEALTHCARE

Integrating advancements in artificial intelligence with sensors and omics, researchers can generate digital twins that provide new insights that can help inform healthcare providers.

03

BEDSIDE TO BENCH AND BACK

Translating robust multiscale, multimodal data from the patient to the laboratory allows for superior models that can be translated back to the clinic to improve outcomes.

GLOBAL MOMENTUM

Interest in NAMs is accelerating worldwide as researchers, regulatory agencies, industry and policymakers increasingly turn to human-relevant systems and predictive approaches to advance clinical translation.

The U.S. Food and Drug Administration, European Medicines Agency and other organizations are outlining validation and regulatory pathways for incorporating NAMs into scientific and therapeutic decision-making. At the same time, growing investment in artificial intelligence, advanced tissue models and data-driven technologies is expanding what these approaches can achieve.

Together, these efforts are helping shift biomedical research toward methods that provide new insight into human biology while accelerating the development and evaluation of new therapies.

BUILDING BETTER BENCHTOP MODELS

CREATING MORE BIOLOGICALLY RELEVANT IN VITRO CULTURE SYSTEMS THAT BETTER REPLICATE COMPLEX HUMAN TISSUES, HOST RESPONSES AND DISEASE.

HUMAN CELL MODELS → **3D PHYSIOLOGICAL FEATURES** → **EFFICIENT THERAPEUTIC SCREENING**

WHY IT MATTERS



Current in vitro models are typically simple, two-dimensional, single-cell layers cultured on hard plastic. These systems do not reflect the complexity of 3D, multicellular human tissue. Using such basic models can alter cellular behavior and lead to inaccurate interpretations.

At UF, BME faculty uniquely combine advances in stem cell technologies with access to human tissues through UF's medical enterprise. They also engineer advanced systems incorporating biomaterials, fluidics and 3D designs to create more realistic environments for studying disease and testing potential therapies.

PRESERVING HUMAN COMPLEXITY

Advancements in culture platforms, supported by engineering design principles, now allow for the study of complex human tissues outside the body. New imaging techniques and spatial proteomics enable targeted investigation of specific phenomena within these live human samples.



Edward A. Phelps, Ph.D.
Associate Professor

Phelps and his team are using a new method of culturing human pancreatic tissue slices, procured from organ donors, to investigate the pathology of type 1 diabetes and screen new therapeutics. This work has yielded new insights into how immune cells are recruited to the pancreas and identified promising immunosuppressive agents.



Walter Lee Murfee, Ph.D.
Professor

Murfee and his team are also utilizing native 3D tissues to study blood vessels. By preserving the complex interactions among blood vessels, cells and surrounding tissues, his team has uncovered new features that contribute to blood vessel growth.

ENGINEERING THE MICROENVIRONMENT

Native tissue contains not only cells but also a complex extracellular matrix filled with dynamic signals. Studies have found that abnormalities in this matrix can drive pathological conditions and alter treatment efficacy. Engineering biomaterials to mimic this native space can not only preserve cell function and provide new insight, but also serve as a platform for therapeutic interventions.



Ana Maria Porras, Ph.D.
Assistant Professor

Porras and her team are exploring the gut microbiome's role in inflammatory bowel disease (IBD) and aortic valve disease. Using comparative bioinformatics and 3D extracellular matrix-based benchtop models, they are investigating how different gut bacteria may contribute to extracellular matrix degradation and fibrosis, hallmarks of both IBD and valve disease.



Brittany Taylor, Ph.D.
Assistant Professor

Taylor and her team are creating 3D biomaterial-based culture platforms that recreate the biophysical microenvironment of tendon extracellular matrix. Better mimics of native tendon allow not only efficient identification of factors that lead to failure but also screening of promising therapeutics.

DESIGNING MODELS FOR DISEASE AND THERAPY

An alternative to preserving the entire native tissue environment is a more bottom-up approach that discretely combines cells and materials, enabling controlled, reproducible hypothesis-driven testing and efficient therapeutic screening. By procuring human cells from clinical biopsies or creating them using stem cell technologies, researchers can combine and study 3D culture models that contain key disease-associated cells in a controlled manner.



Blanka Sharma, Ph.D.
Associate Professor

Sharma and her team are creating 3D tumor models within materials to investigate how specific immune cells migrate through the matrix to attack the tumor. By creating materials with distinct properties, researchers can study how a tumor's surrounding matrix protects it from immunological rejection and, in turn, bypass it to enable cancer immunotherapy.



Cherie Stabler, Ph.D.
Professor & Department Chair

Stabler and her team are designing 3D microphysiological systems to study the pathogenesis of type 1 diabetes and screen therapeutics. By combining stem cell-derived cells with optimized extracellular matrices in defined niches, they have created a benchtop system that provides new insight into how immune cells are recruited to and kill insulin-secreting beta cells, while also allowing testing of new drugs that inhibit these processes.

These models, which better preserve, replicate, and/or respond to human biology, allow UF BME researchers to study distinct pathways that contribute to a pathology, as well as more efficiently screen promising therapeutics.

PERSONALIZED, AI-SUPPORTED HEALTHCARE

IMPROVING HEALTHCARE REQUIRES THE HOLISTIC INTEGRATION OF COMPREHENSIVE DATASETS, SOURCED FROM BIOLOGICAL AND ENVIRONMENTAL FACTORS, WITH ETHICAL AND REFINED COMPUTATIONAL MODELS.

COMPREHENSIVE CLINICAL DATASETS → **HOLISTIC COMPUTATIONAL MODELS** → **PRECISION CARE**

WHY IT MATTERS

We are all unique individuals, and these differences in genetics, lifestyle and environment can influence an individual's response to treatment. Implementing a holistic, personalized approach to healthcare has historically been hindered by limited access to robust datasets and insufficient artificial intelligence capabilities.

At UF Biomedical Engineering, researchers leverage UF's powerful, integrated AI and clinical ecosystem to generate predictive digital twins by collecting comprehensive datasets that capture diverse physiological and environmental features. These data are combined with optimized algorithms and computational models, enabling clinicians to receive data-driven guidance tailored to the individual.

PREDICTING PATIENT OUTCOMES & IMPROVING DIAGNOSIS

Data from multiple sources have long driven clinical care decisions. However, an abundance of complex and diverse test results can easily lead to diminished insight. Creating robust machine learning models using extensive health record datasets can help identify key trends or subtle cues buried in these complex datasets.



Parisa Rashidi, Ph.D.
Professor

Rashidi and her team developed an artificial intelligence model using a large language model (LLM) to accurately predict which intensive care unit (ICU) patients were at risk of developing delirium. By recognizing early patterns in patient medical data, this system could help healthcare teams intervene earlier to prevent or manage acute brain confusion. Ultimately, this AI-driven approach offers a scalable tool to improve critical care, shorten hospital stays and lower patient mortality.



Kuang Gong, Ph.D.
Assistant Professor

Gong and his team are utilizing computational approaches to improve medical imaging diagnostics. They recently published a new artificial intelligence system designed to analyze 3D medical scans—such as CT and MRI images—and connect them directly with clinical text. This system could generate automated radiology reports and answer complex diagnostic questions more accurately, paving the way for faster, more reliable medical image interpretation in patient care.

AI-ENABLED PRECISION THERAPY

Clinicians have long observed diversity in patient responses to the same medicine. While some therapeutics can be highly effective for one person, they may be completely ineffective, or even harmful, for another. Clinicians have long sought to identify key markers that could distinguish a "responder" from a "nonresponder"; however, the complexity of human biology is rarely explained by a single test. Emerging tools can now collect expansive protein and gene expression profiles, or "-omics", resulting in a personalized biological dataset. UF BME researchers are seeking to leverage computational approaches to translate a person's complex biological signature into improved treatment plans or to identify patients at risk for specific conditions.



Meghan
Ferrall-Fairbanks, Ph.D.
Assistant Professor

Ferrall-Fairbanks recently received a highly competitive NIH Maximizing Investigators' Research Award (MIRA) that seeks to address sepsis in cancer patients. Her team is combining electronic health records, advanced molecular data and machine learning to build AI models that can predict a patient's specific sepsis risk before severe symptoms even appear. By mapping how a person's unique cellular environment drives infection, this project aims to create personalized, early interventions that protect vulnerable cancer patients and transform critical care.



Ivana Parker, Ph.D.
Assistant Professor

Parker recently received an NIH Director's Pioneer Award to support research that uses AI and clinical, multilevel "omics" data to examine how complex combinations of bacteria alter immune cells, potentially making them more susceptible to HIV infection. By pinpointing the specific bacterial profiles that drive this increased risk, her project aims to identify new avenues for HIV prevention and potentially pave the way for personalized probiotic treatments.



Xiao Fan, Ph.D.
Assistant Professor

Fan received an NIH Director's Pioneer Award for research using natural language processing, the technology behind modern AI, to read DNA as a complex biological language and decipher the mysterious "noncoding" regions of the genome. By training a multitask AI model to learn the rules of this genetic code, the tool could predict how subtle DNA variations affect gene regulation and human health without the need for costly laboratory experiments.

By turning complex data into insight, UF BME researchers are building a stronger foundation for prediction, personalization and human-relevant discovery.

BEDSIDE TO BENCH AND BACK

INCORPORATING ENGINEERS INTO THE CLINIC LETS REAL HUMAN DATA DRIVE RESEARCH QUESTIONS TESTED IN THE LAB, THEN OPTIMIZE APPROACHES TO IMPROVE CLINICAL OUTCOMES.

HUMAN SUBJECT INTEGRATION → **LABORATORY OPTIMIZATION** → **IMPROVED CLINICAL OUTCOMES**

WHY IT MATTERS

Clinicians encounter the limitations of current technologies and therapies daily but are restricted in their ability to improve them. Biomedical engineers are trained to use an engineering approach to refine and solve clinical problems. Immersive partnerships between engineers and clinicians can make the path from problem to solution more efficient, but the lack of co-location and collaborative spaces often hinders them.

At UF, BME faculty have an established collaborative ecosystem with clinicians that supports this optimization cycle. By leveraging engineering's proximity to UF Health, engineers can seamlessly integrate into clinical studies and patient interactions. These interactions not only hone the engineering question, but provide real-world clinical data that can be taken back to the laboratory to improve models. Data from these laboratory trials can then be cycled back to clinicians to improve patient outcomes, optimize treatments and/or identify new questions for further clinical investigation.

PATIENT DATA DRIVING OPTIMIZED TREATMENTS

Immersion of BME faculty within clinical teams facilitates a collaborative approach to both treating patients and collecting key datasets or biological markers for laboratory use. This partnership gives engineers deeper insight into specific human-centered metrics, either through easier access to clinical samples or close collaborations that enable on-site data collection. These multiscale, multimodal human subject data can then be analyzed in the lab to identify novel pathways or emerging patterns that inform clinical guidance and interventions.



Kyle Allen, Ph.D.
Professor

Allen leads multi-institutional projects seeking to address chronic musculoskeletal pain, a major source of disability and a primary driver of opioid use, in areas such as the lower back, the knees and the jaw. A key obstacle is that we still lack a clear picture of how pain mechanisms differ across body parts. To address this, his team of clinicians and engineers is collecting extensive patient clinical data, including biomarkers, tissues, movement and psychological assessments, to create a comprehensive patient data repository and biobank. By mapping these shared and unique pain profiles, his research seeks to guide clinicians toward more targeted, personalized pain treatments that reduce reliance on opioids.



Aysegul Gunduz, Ph.D.
Professor

Gunduz and her team collaborate with clinical neurology to develop, test, and optimize neurotechnologies to treat people with neurological and neuropsychiatric disorders. Data they collect from additional sensors placed during neurological interventions, such as deep brain stimulation, allow them to capture real-world information that has driven improvements in these technologies, such as targeting the stimulation period only to times when motor dysfunction is detected.

BUILDING PERSONALIZED VIRTUAL MODELS

Advancements in AI and the expansion of patient-specific datasets support the feasibility of creating personalized computer simulations, sometimes referred to as "digital twins," that can be leveraged to elevate disease diagnosis, personalize treatment options, predict therapeutic dosages and/or optimize clinical trial cohorts. Challenges that have limited the field include access to robust datasets and powerful computers. At UF, BME faculty are leveraging UF's computing power and their integration with clinicians to build improved, personalized computational models. These models are then used in the laboratory to test clinical questions, leading to new guidelines for clinicians.



Wesley Bolch, Ph.D.
Distinguished Professor

Bolch and his team have used computer animation software and real patient imaging data to create a robust library of pediatric and adult male and female models representing a broad range of heights, weights and body shapes. These anatomic models have been used to estimate organ doses in diagnostic imaging and radiation therapy, helping make treatment planning more accurate and patient-specific. A recent study provided new clinical guidance on the use of CT scans for pediatric patients with blood cancers.



Jennifer Nichols, Ph.D.
Associate Professor

Nichols and her team use a variety of human-subject data, including 3D motion analysis, electromyography, medical imaging, and musculoskeletal models, to build improved predictive, biomechanical simulations that seek to elevate functional ability and quality of life for individuals with musculoskeletal disorders. A recent study revealed that women with advanced thumb arthritis suffer from significantly worse pain, disability, and nerve-related hypersensitivity compared to those in early stages of the condition. By testing patients' reactions to physical sensations like temperature and pressure across different body sites, researchers found that end-stage thumb arthritis involves widespread nerve changes rather than just localized joint damage. These findings highlight that effective treatment for advanced thumb arthritis requires comprehensive approaches that address both joint inflammation and broader nervous system pain processing.

By connecting engineers and clinicians, UF BME researchers are helping move discovery toward more accurate prediction, stronger validation and improved patient care.

RESEARCH SNAPSHOT

3D MODEL SHOWS PROMISE IN STUDYING LUNG CANCER

A 3D HYDROGEL MODEL PROVIDES A FAST AND ADJUSTABLE PLATFORM FOR STUDYING LUNG CANCER BIOLOGY AND EVALUATING HOW THERAPIES WORK, UF HEALTH CANCER INSTITUTE RESEARCHERS HAVE FOUND.

The versatile tool, described in a recent publication in a special issue on cancer and regenerative medicine in the journal *Tissue Engineering Part C: Methods*, could help researchers better screen therapies for a variety of cancers before they're tested in animals, boosting research efficiency. It could also help researchers track how a cancer therapy is working, filling gaps between conventional tissue cultures, animals and clinical studies.

"Our goal was to get an understanding of where this model fits in the spectrum of typical preclinical models, from conventional 2D systems to animal models, and we found this 3D hydrogel model could fill a gap in between those," said Blanka Sharma, Ph.D., an associate professor in the J. Crayton Pruitt Family Department of Biomedical Engineering and the study's senior author.

A major challenge for studying diseases is that laboratory models don't always resemble or translate to what happens in animals or people. Sharma's team saw a need for a tissue culture that resembles human functioning and that researchers could control to understand how small changes in cellular function or the environment impact diseases.

A hydrogel model is like a Jello, with a network of long, cross-linking molecules called polymers that give it structure. The model mimics human tissue characteristics and, importantly, can be adjusted to simulate how tumors behave.

"With a hydrogel, we can create an environment that resembles the mechanical environment that cells see within the body, which makes it useful for studying a number of diseases," Sharma said. "In cancer, having a 3D environment where we can control things like the stiffness or composition of the tumor provides an advantage over most conventional tissue culture systems."

The researchers measured the model's performance in lung cancer, which remains the deadliest cancer in the United States. The new study advances the field of tissue engineering, becoming the first to compare transcriptional profiles produced by a lung cancer hydrogel model with other preclinical models of lung cancer. A transcriptional profile measures gene expression, giving a snapshot of a cell's function.

After seven days of growing in hydrogels, cells began to resemble those that had been grown for three weeks in an animal, the study found.

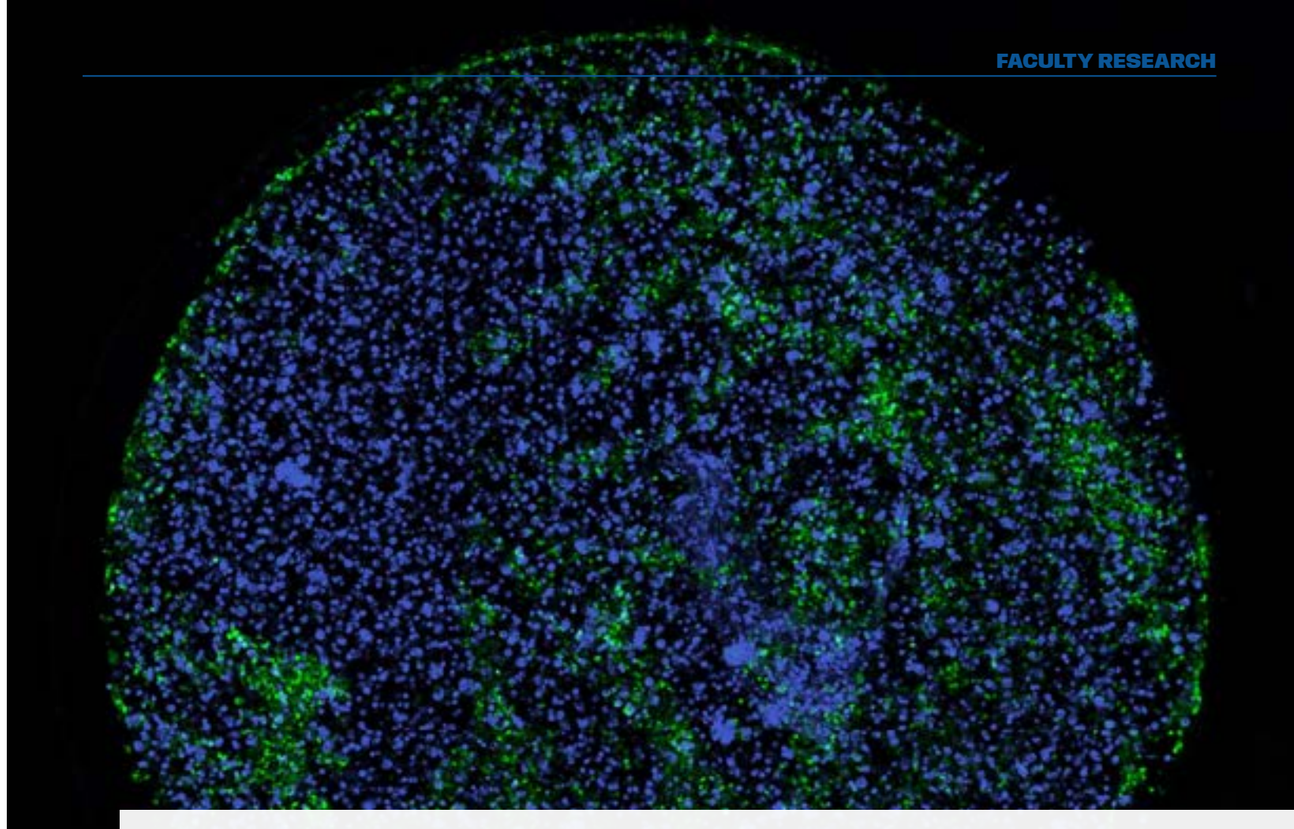
"Compared to cancer cells grown in a two-dimensional petri dish, the cells grown in hydrogels had a transcriptional profile that was closer to human tumors growing in the body," Sharma said.

Researchers ultimately want to use the 3D model to understand how certain immune cells, particularly natural killer cells, interact with cancer cells. The new study showed the hydrogel model successfully mimicked inflammatory pathways and inflammatory signaling, indicating its potential use for those studies, Sharma said.



"WE WANTED TO ESTABLISH A PROCESS THAT HAS A LOT OF TUNABILITY IN PROPERTIES, BUT THAT IS SIMPLE AND EASY ENOUGH TO BE READILY ADOPTED BY OTHER LABS," SHARMA SAID. "WE WOULD LOVE TO SEE MORE GROUPS INTERESTED IN USING THESE TYPES OF SYSTEMS TO STUDY VARIOUS MECHANISMS IN CANCER BIOLOGY."

Blanka Sharma



"What excited me most was seeing that our synthetic hydrogel models replicated key features of tumors grown in vivo while remaining accessible to most research laboratories. Their modular design allows researchers to adjust the model to their specific questions, helping bridge the gap between traditional 2D cell cultures and complex animal models. Collaborating with bioinformaticians at the UF Health Cancer Institute also expanded the work beyond tissue engineering, revealing genetic insights we could not have identified through physical observations alone."

- Suzanne Lightsey, Ph.D., a former graduate student in Sharma's lab

A MICROSCOPIC VIEW OF THE HYDROGEL CONTAINING LUNG CANCER CELLS (BLUE) AND NATURAL KILLER CELLS (GREEN). RESEARCHERS INCUBATED THE HYDROGELS PLUS CANCER CELLS WITH NATURAL KILLER CELLS TO OBSERVE THEIR INTERACTIONS, HIGHLIGHTING THE UTILITY OF THE MODEL SYSTEM TO STUDY THESE INTERACTIONS.

The team also hopes to expand the work to include patient samples to provide more personalized therapeutic strategies, as well as get a better understanding of why certain patients respond to treatments and others don't.

The UF Health Cancer Institute's Biostatistics and Computational Biology Shared Resource team, including co-authors Heather Kates, Ph.D., Kalyanee Shirlekar, M.S., and Jason Brant, Ph.D., performed RNA sequencing and other analyses for the study, which was funded through a Cancer Institute Shared Resources pilot grant, as well as the National Science Foundation and the Leo Clair and Robert Adenbaum Foundation. Suzanne Lightsey, Ph.D., a former graduate student in Sharma's lab, is the study's first author.

Originally published by the UF Health Cancer Institute

FROM JAR OPENERS TO KEY GRIPPERS, DEVICES DESIGNED BY UF STUDENTS HELP PEOPLE WITH DISABILITIES



Dug Jones, a Gainesville resident and longtime collaborator with the Department of Occupational Therapy, talks about the plastic bracket designed to stabilize his wheelchair bag with the students who designed and 3D-printed it.

Photo by Ashleigh Lucas

While access has improved for people with disabilities, small inconveniences still exist everywhere. To solve that — piece by piece — students from the University of Florida College of Public Health and Health Professions and the J. Crayton Pruitt Family Department of Biomedical Engineering within the Herbert Wertheim College of Engineering are helping design 3D-printed assistive devices for community members with unique needs.

The devices community members asked for are simple — a specialized jar opener, a key gripper, an adjustable iPad stand and a phone stabilizer — items that are hard to find because they aren't manufactured on a large scale like wheelchairs and prosthetic limbs.

After the collaborative design phase, engineering students created the plans to 3D-print the assistive devices.

Living without the smaller items might not be the biggest problem in the world, "but it is a daily nuisance," said Gainesville resident Dug Jones, a participant in the project. "We are at a point where so many of the really critical needs have been addressed, so we can turn our attention to more quality-of-life things."

During the fall, UF Doctor of Occupational Therapy students met with community participants and Generational Relief in Prosthetics, or GRiP — an interdisciplinary student organization, funded by the J. Crayton Pruitt Family Department of Biomedical Engineering, that provides free 3D-printed assistive devices to people who might otherwise not be able to get them due to cost or availability.



Engineering students (left to right) Ryan Lomaglio, Hannah Burdzy and Katya Tipps replace the zipper bag on Dug Jones's wheelchair after attaching a plastic bracket that will allow Jones to open the bag with one hand. Photo by Ashleigh Lucas

Becky Piazza, O.T.D., OTR/L, a clinical assistant professor in the Department of Occupational Therapy, connected with GRiP president and fourth-year biomedical engineering student Saanvi Kodiganti about involving occupational therapy students in identifying new assistive devices.

"We all have different skill sets," Kodiganti said. "It's like two pieces of a puzzle that get to come together and make really cool products for people who are in need."

Students visited clients in their homes to hear their ideas for assistive devices, which was an unusual and valuable opportunity, second-year occupational therapy student Paige Zolecki said.

"In other clinical scenarios, they may describe their home, but that's not something we ever get to see," Zolecki said. "It gave us a unique opportunity to see how they interact day to day."

Zolecki and her team met with Newberry resident Margaret Crum, who proposed several devices to help with declining balance, strength and mobility. Her idea for a wedge to keep her leg elevated in her reclining chair was selected for production.

After the initial design phase, GRiP created blueprints for the items and began 3D-printing and distributing them in the spring.

Jones received one of the simplest items: a bracket to stabilize the wheelchair bag he has used daily for 10 years to hold his phone, driver's license and other essentials. The cloth bag hangs under the seat of his wheelchair and requires Jones to reach down with both hands — one to hold the bag in place and one to unzip it.

An initial prototype of the bracket broke, so GRiP re-printed it with a slight design revision and a different type of plastic. After a few minutes of installation, Jones was able to lean over and unzip the bag with one hand.

"The goal has been accomplished," Jones said.

GRiP and Piazza plan to continue the collaboration next year, with hopes to expand so more students can participate.



BEYOND THE CLASSROOM

Saanvi Kodiganti
Former GRiP President, '26 UF BME B.S. graduate

"This collaboration gave engineering students the opportunity to experience human-centered design in a way that can't be replicated in the classroom. GRiP members applied their technical skills to create a physical product while learning how to conduct user research and design an intuitive solution. What makes the experience especially meaningful is seeing the process come full circle, from meeting the client and understanding their needs to delivering a finished device that can make a real difference in that person's life. That kind of experience is rare in a traditional engineering curriculum, and I'm grateful I was able to help give our members that opportunity."

2025–2026 ACADEMIC YEAR

STUDENT-LED IMPACT

UF BME supports eight student organizations, giving students opportunities to build leadership skills, connect with industry, serve the community and explore biomedical engineering beyond the classroom.

TOTAL ATTENDEES	EVENTS	STUDENT ORGANIZATIONS
1,300	48	8

6	$8,200
COMMUNITY OUTREACH EVENTS	INVESTED IN STUDENT-LED EVENTS

HIGHLIGHTS

- GRiP's general body meetings drew as many as 420 students.
- SFB hosted Regional Biomaterials Day, our largest student-led event of the year.
- ASB's 3-Minute Thesis competition awarded $150 in student scholarships.

UF BME STUDENT ORGANIZATIONS

American Society for Biomechanics (ASB), BME Inclusive Excellence (BME IE), Biomedical Engineering Society (BMES), Engineering in Medicine & Biology Society at UF (EMBS), Generational Relief in Prosthetics (GRiP), Graduate Student Council (GSC), Policy Advocacy in Science and Engineering (PASE), and University of Florida Society for Biomaterials (SFB).

ADVANCING BIOMATERIALS FOR TISSUE REGENERATION AND IMMUNOENGINEERING

UF BME WELCOMES BRET ULERY, PH.D., WHOSE RESEARCH USES INNOVATIVE BIOMATERIALS TO INFLUENCE CELLULAR AND TISSUE RESPONSES AND ADDRESS UNMET CLINICAL NEEDS.



Bret Ulery, Ph.D., will join the J. Crayton Pruitt Family Department of Biomedical Engineering in fall 2027, bringing expertise at the intersection of biomaterials, regenerative engineering and immunoengineering.

Ulery leads the Biomodulatory Materials Engineering Laboratory, or BioMEL, where his research team designs novel biomaterials engineered to actively influence cellular and tissue responses. These biomodulatory materials are being developed to address a range of biomedical challenges, from improving tissue regeneration to harnessing the immune system for therapeutic applications.

His research focuses on engineering the physicochemical properties of biomaterials to induce targeted biological outcomes. Current applications include promoting vascularization and innervation during complex tissue regeneration, leveraging immune responses to enhance regenerative engineering, and developing targeted peptide delivery systems that stimulate specific immunological responses.

Before joining UF, Ulery was a faculty member at the University of Missouri, where he joined the Department of Chemical & Biomedical Engineering as an assistant professor in 2014. His research has contributed to more than 50 peer-reviewed publications, manuscript submissions, book chapters and technology disclosures.

Ulery earned a Bachelor of Science in Engineering in chemical engineering and a Bachelor of Science in biochemistry from the University of Iowa. He earned his doctorate in chemical engineering, with a graduate minor in immunobiology, from Iowa State University. He later completed postdoctoral training in regenerative engineering at the University of Connecticut Health Center and in biomolecular materials at the University of Chicago.

At UF BME, Ulery's expertise strengthens the department's growing research efforts in biomaterials, regenerative medicine and immunoengineering while opening new opportunities for interdisciplinary collaboration and clinical translation.

NEW ACADEMIC LEADERSHIP



CHRIS GEIGER



WALTER LEE MURFEE

Christopher Geiger, Ph.D., has been appointed associate chair for undergraduate studies, while Lee Murfee, Ph.D., will serve as senior associate chair.

Geiger succeeds Murfee, who has led undergraduate studies since 2020. In his new role, Geiger will help guide the undergraduate curriculum, student programs and industry engagement, building on his work in senior design, ABET accreditation, experiential learning and industry partnerships.

As senior associate chair, Murfee will support strategic initiatives across undergraduate and graduate education, including curriculum development, academic infrastructure and faculty mentorship. His previous leadership helped expand hands-on learning opportunities and strengthen the undergraduate program.

NEW INDUSTRY PARTNER

Shukla Medical Joins UF BME as Silver-Level Industry Partner

UF BME is pleased to welcome Shukla Medical as its newest Silver-Level Industry Partner. The company develops surgeon-driven extraction solutions designed to simplify complex orthopedic procedures, reduce operating room time, minimize bone loss and improve surgical precision.

Shukla Medical's roots date to the development of a universal intramedullary nail removal system, an effort that brought together orthopedic expertise and engineering innovation. Today, the company offers a growing portfolio of instruments and systems designed to address common challenges faced by orthopedic and spine surgeons in the operating room.

Through its partnership with UF BME, Shukla Medical joins a network of industry leaders helping connect students and faculty with the technologies, challenges and opportunities shaping biomedical engineering.

UF BME Industry Partners

Platinum: Arthrex

Gold: Axogen and LifeLink Tissue Bank

Silver: Alafair Biosciences, Evergen, Edwards Lifesciences, KLS Martin and Shukla Medical



Senior Design Highlight:

UF BME senior design team Alafill partnered with Alafair Biosciences to create an automated tube-filling system designed to improve manufacturing efficiency and reduce ergonomic strain.



Senior Design Highlight:

UF BME senior design team Calcifilters worked with clinical collaborators from UF Health to develop a prototype device designed to improve safety during transcatheter aortic valve explant procedures. Their "debris catcher" is intended to prevent calcium and tissue from entering the bloodstream, helping reduce the risk of embolic stroke.

PARTNER WITH US

Industry partnerships connect companies with UF BME students, faculty and the next generation of biomedical engineering talent. Through partnership opportunities, organizations can engage with students, build connections with faculty and support experiences that help prepare future biomedical engineers.



Learn more about becoming a UF BME industry partner.

OUR COMMON BOND IS MORE THAN A RALLYING CRY. IT'S A CALLING.

HOW CAN YOU MAKE AN IMPACT?

At the University of Florida's J. Crayton Pruitt Family Department of Biomedical Engineering, excellence means more than discovery. It's about impact. By supporting the BME Excellence Fund, you empower our students and faculty to push the boundaries of research, develop life-changing technologies and prepare the next generation of biomedical innovators. With your partnership, we can accelerate progress and transform lives.

Scan here to support UF BME's Excellence Fund.



Interested in supporting UF BME? Connect with Nate Cross, Senior Director of Development, at ntcross@ufl.edu or (352) 294-7953 to learn how you can make an impact.

AWARDS & RECOGNITIONS



WESLEY BOLCH
University of Florida Research Foundation Professorship, Chang & Szalay Samaritan Biologics Endowed Professorship



PARISA RASHIDI
Faculty Award for Excellence, Herbert Wertheim College of Engineering



MEGHAN FERRALL-FAIRBANKS
40 Gators Under 40 Award & NIH Early Stage Investigator Maximizing Investigators' Research Award (ESI MIRA, R35)



CARLOS RINALDI-RAMOS
Academy of Science, Engineering and Medicine of Florida (ASEMFL), 2026 Inductee, University of Florida Research Foundation Professorship



DANIEL FERRIS
National Institute of Neurological Disorders and Stroke (NINDS) Landis Award for Outstanding Mentorship



ANA MARIA PORRAS
UF Educator of the Year (Junior Faculty), ASEMFL Rising Star in Science Award, 2026 AIMBE Emerging Leader Award



GREGORY HUDALLA
UF Tech Licensing's Invention of the Year



CHRISTINE SCHMIDT
Academy of Science, Engineering and Medicine of Florida President



JENNIFER A. NICHOLS
Doctoral Dissertation Advisor/Mentoring Award, Herbert Wertheim College of Engineering



CHERIE STABLER
Academy of Science, Engineering and Medicine of Florida Inductee



IVANA PARKER
National Academies U.S.-Africa Frontiers Symposium Selection



BRITTANY TAYLOR
National Science Foundation Faculty Early Career Development Program (CAREER) Award



KYLE ALLEN RECEIVES THREE MAJOR HONORS

Adele L. Boskey, Ph.D., Award for Mentorship and Research Excellence, AIMBE Fellow & BMES Fellow

Kyle D. Allen, Ph.D., professor, received three major professional honors. He was named the 2026 recipient of the Adele L. Boskey, Ph.D., Award for Mentorship and Research Excellence from the Orthopaedic Research Society, recognizing his sustained commitment to mentorship and innovative research. Allen was also elected a fellow of both the American Institute for Medical and Biological Engineering (AIMBE) and the Biomedical Engineering Society (BMES).

PROMOTION



MAY MANSY
Promoted to Instructional Associate Professor

SERVICE



WESLEY BOLCH
Catalyst Award, UF Center for Undergraduate Research (15 Years of Continuous Support)



Kyle Allen
Professor
Novel strategies to diagnose and treat joint disease that scale from preclinical models to equine or human patients



Aysegul Gunduz
Professor & Fixel Brain Mapping Professor
Human brain mapping, neuromodulation and neural interfacing



Parisa Rashidi
Professor & Intelligent Clinical Care Center (IC3) Co-Director
Medical artificial intelligence (AI) and pervasive health



Wesley E. Bolch
Distinguished Prof., UF Term Prof., UF Research Foundation Prof. & Chang & Szalay Samaritan Biologics Endowed Professor
Dosimetry, computational medical physics and radiation dose assessment



Gregory A. Hudalla
Professor, Integra LifeSciences Term Professor
Molecular engineering for immunotherapies and immune modulation



Carlos Rinaldi-Ramos
Professor & UF Research Foundation Professor
Nanomedicine and magnetic nanoparticles



Markia Bowe
Instructional Assistant Professor & Director of Professional Experiences
Biomechanics of bone, 3D imaging, inclusive design and engineering education research



Benjamin G. Keselowsky
Professor
Biomaterials and immune engineering



Christine E. Schmidt
Distinguished Professor & J. Crayton Pruitt Family Endowed Chair
Biomaterials for neural tissue regeneration and neural interfacing



Lesley W. Chow
Associate Professor
Biomaterials for regenerative medicine, musculoskeletal tissue engineering and 3D printing



Jamal Lewis
Associate Professor & Graduate Coordinator
Biomaterials, drug delivery and immunoengineering



Blanka Sharma
Associate Professor & Associate Co-Chair for Graduate Studies
Nanomedicine, biomaterials, targeted drug/gene delivery and immunoengineering



Mingzhou Ding
Distinguished Professor & J. Crayton Pruitt Family Professor
Cognitive neuroscience, signal processing and neural imaging



May Mansy
Instructional Associate Professor, Director of Peer Learning and Mentoring & J. Crayton Pruitt Family Term Fellow
Bio-signals & systems, instrumentation and engineering education



Cherie Stabler
Professor & Department Chair, J. Crayton Pruitt Family & UF Foundation Preeminence Professor
Biomaterials, controlled release, regenerative medicine and diabetes



Xiao Fan
Assistant Professor
Computational approaches to study genetic architecture of rare diseases and interpretation of genetic variants



Walter Lee Murfee
Professor & Senior Associate Chair
Cell dynamics, microcirculation, angiogenesis, lymphangiogenesis and neurogenesis



Brittany Taylor
Assistant Professor & J. Crayton Pruitt Family Term Fellow
Nanomedicine, regenerative rehabilitation, biomaterials and tendon injury and disease



Meghan Ferrall-Fairbanks
Assistant Professor
Cancer systems biology, mathematical oncology, tumor evolution and sepsis



Jennifer A. Nichols
Associate Professor
Biomechanics, musculoskeletal modeling, predictive simulation, medical imaging and machine learning



Lakiesha N. Williams
Professor & Associate Co-Chair for Graduate Studies
Traumatic brain injury, Alzheimer's disease and related dementias, soft tissue biomechanics



Daniel Ferris
Robert W. Adenbaum Professor in Engineering Innovation & Director, Center for Engineering Human Performance & Wellness
Biomechanics, neuromechanics, brain imaging and prosthetics



Ivana Parker
Assistant Professor
Trained immunity, systems biology, HIV/TB, host-pathogen interactions and applied proteomics



Bret Ulery (Fall 2027)
Associate Professor
Immune-mediated regeneration, complex tissue regeneration and targeted peptide delivery



Chris Geiger
Instructional Associate Professor & Associate Chair for Undergraduate Studies
Senior Design and engineering education research

Edward A. Phelps
Associate Professor
Biomaterials, islet biology, diabetes and immune engineering

Kuang Gong
Assistant Professor
Deep learning, medical imaging and data science

Ana Maria Porras
Assistant Professor & J. Crayton Pruitt Family Term Fellow
Cell and tissue engineering to study human-microbe interactions and evidence-based public engagement with science

BME FACULTY BY THE NUMBERS

28 PRIMARY FACULTY	**55+** AFFILIATE FACULTY
15 DISTINGUISHED EARLY CAREER AWARDS (NSF CAREER, NIH DIRECTOR'S NEW INNOVATOR, PECASE)	**27** SOCIETY FELLOW AND NATIONAL ACADEMY DISTINCTIONS HELD BY FACULTY

UF RESEARCHERS ADVANCE PROMISING PROTEIN THERAPEUTIC FOR INFLAMMATORY DISEASES

Researchers at the University of Florida have developed a protein-based therapeutic that could offer a new strategy for treating autoimmune and chronic inflammatory diseases while preserving the body's natural ability to fight infection.

PUBLISHED IN PNAS

The study appears in the Proceedings of the National Academy of Sciences, Vol. 123, No. 28, e2602536123 (2026).

HOW PEG-IDO WORKS

Indoleamine 2,3-dioxygenase (IDO) is a naturally occurring enzyme that helps regulate immune responses by breaking down the amino acid tryptophan and producing metabolites that influence immune cell behavior. Keselowsky's laboratory has studied ways to deliver IDO as a therapeutic for several years, including approaches designed to control inflammation locally.

For the new study, researchers sought to expand the therapeutic potential of IDO by developing a version that could circulate throughout the body. They attached polyethylene glycol, or PEG, to the enzyme, a process known as PEGylation. The modification extended the amount of time IDO remained in circulation while maintaining its activity.

A single platform. Broader possibilities.

By combining systemic delivery, tunable circulation and immune regulation without broad immunosuppression, PEG-IDO has the potential to treat a range of autoimmune and inflammatory diseases.

Engineered PEG-IDO regulates harmful inflammation without broadly suppressing the immune system, moving a long-running UF BME research effort closer to clinical translation.

PROMISING RESULTS ACROSS DISEASE MODELS

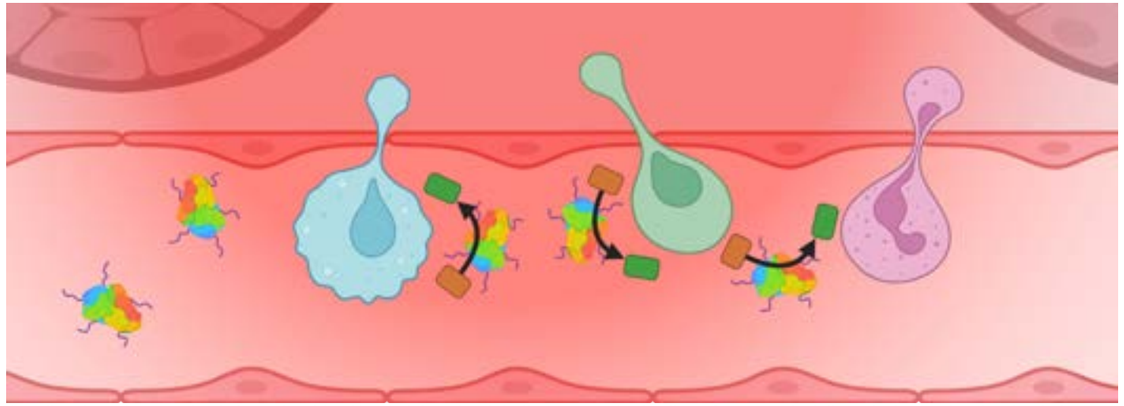
The PEG-IDO therapeutic demonstrated beneficial effects across multiple preclinical models representing inflammatory conditions affecting different tissues and organ systems. Researchers found that the treatment increased regulatory immune cell populations, reduced inflammatory immune activity and protected against inflammation-driven tissue damage.

Notably, the team observed therapeutic effects with only one or two doses, depending on the application and PEG-IDO formulation. The therapeutic could also be adjusted to provide different circulation times, offering the potential to tailor PEG-IDO to the needs of different inflammatory conditions.



"PEG-IDO bypasses this major hurdle and demonstrates a broad therapeutic dosing window without immunosuppression, despite its systemic delivery. This was an impactful finding for us and shows a lot of promise for the clinical translation of PEG-IDO."

Jennifer A. Simonovich, Ph.D.
First author, Keselowsky Lab



Coupling the polymer polyethylene glycol (PEG) to indoleamine 2,3-dioxygenase (IDO) allows for systemic delivery by increasing the circulation time in the bloodstream. IDO influences cells of the immune system by converting the amino acid tryptophan into the metabolite kynurenine.

THE TEAM



Benjamin G. Keselowsky, Ph.D., Professor *Principal Investigator*



Jennifer A. Simonovich, Ph.D., Postdoctoral Researcher, Keselowsky Lab



Greg Hudalla, Ph.D., Professor & Integra LifeSciences Term Professor



Dorina Avram, Ph.D., Department of Immunology, Moffitt Cancer Center



Ali Zarrinpar, M.D., Ph.D., Professor, UF Department of Surgery



Sergio Duarte, Ph.D., Assistant Professor, UF Department of Surgery



Scott T. Robinson, M.D., Ph.D., Vascular surgeon, MaineHealth Maine Medical Center

FROM ENGINEERING STRATEGY TO THERAPEUTIC PLATFORM

ENGINEERING IDO FOR SYSTEMIC DELIVERY

To expand its therapeutic potential, researchers engineered a version of IDO that could circulate throughout the body. By attaching polyethylene glycol, or PEG, to the enzyme, they extended its circulation time while maintaining its activity.

This approach allows PEG-IDO to regulate harmful inflammation systemically without broadly suppressing the immune system.

A PLATFORM ACROSS INFLAMMATORY DISEASES

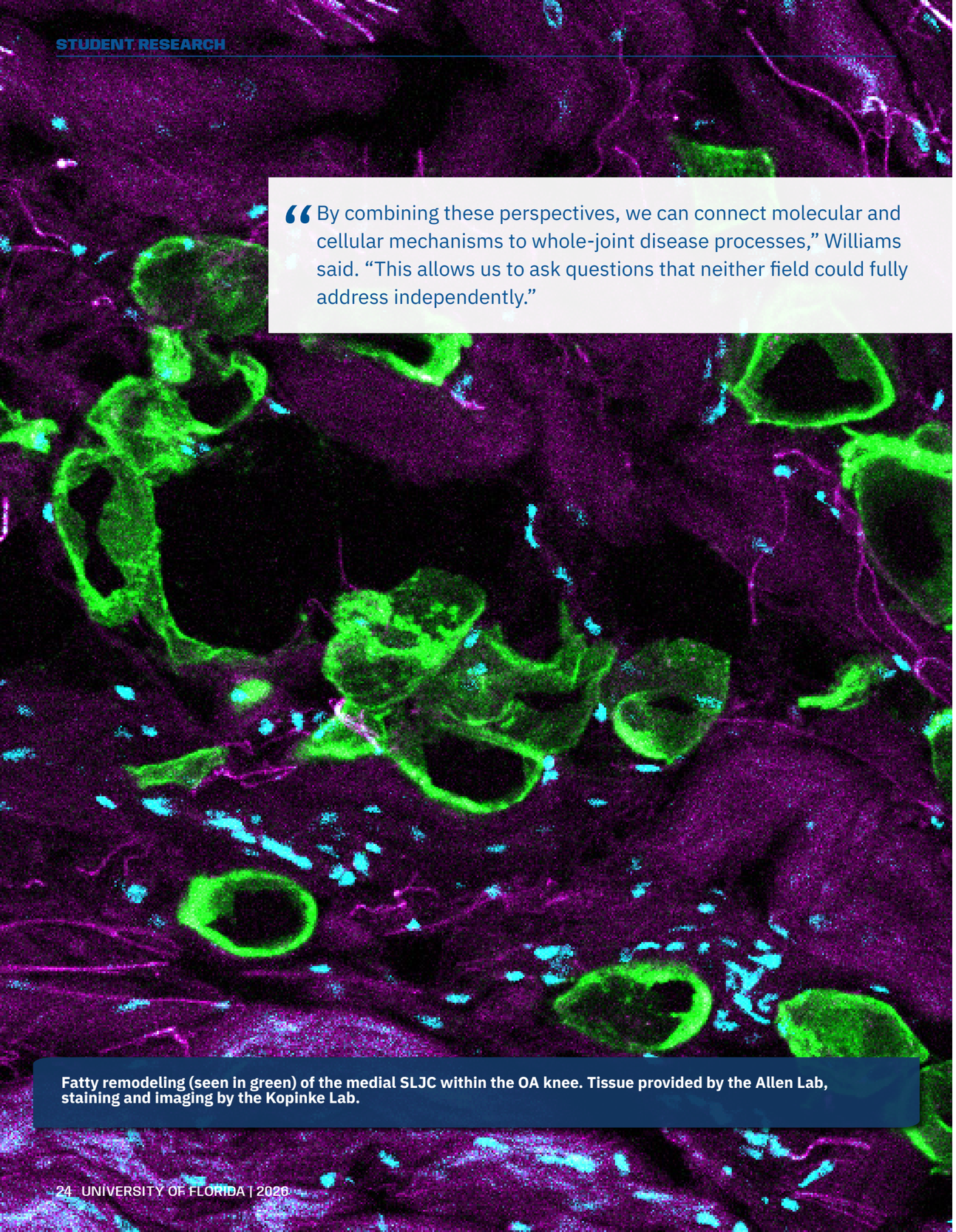
PEG-IDO demonstrated beneficial effects across preclinical models of inflammatory diseases affecting different tissues and organ systems. The treatment increased regulatory immune cell populations, reduced inflammatory activity and protected against tissue damage.

Researchers observed therapeutic effects with as few as one or two doses, and circulation time can be tailored to fit the needs of different conditions.

COLLABORATION DRIVES TRANSLATION

The study brought together expertise in biomedical engineering, immunology, transplantation surgery and vascular surgery. Collaborators contributed key insights and resources, allowing the team to evaluate the same engineered therapeutic across diverse inflammatory conditions.

The findings build on years of work in the Keselowsky laboratory exploring IDO as an immunomodulatory therapeutic. By combining systemic delivery, tunable circulation and immune regulation without broad immunosuppression, PEG-IDO could provide a foundation for new approaches to treating autoimmune and inflammatory diseases while moving the technology closer to clinical translation.



> “By combining these perspectives, we can connect molecular and cellular mechanisms to whole-joint disease processes,” Williams said. “This allows us to ask questions that neither field could fully address independently.”

Fatty remodeling (seen in green) of the medial SLJC within the OA knee. Tissue provided by the Allen Lab, staining and imaging by the Kopinke Lab.

ENGINEERING AND PHARMACOLOGY TRAINEES UNITE TO ADVANCE OSTEOARTHRITIS RESEARCH

UF DOCTORAL STUDENTS COMBINE COMPLEMENTARY EXPERTISE TO UNCOVER HOW FATTY AND FIBROTIC TISSUE CHANGES MAY CONTRIBUTE TO OSTEOARTHRITIS PROGRESSION.



YANCEY WILLIAMS II



HAILEY JONES

Biomedical engineering Ph.D. student Yancey Williams II and pharmacology Ph.D. student Hailey Jones are combining their expertise to investigate an often-overlooked aspect of osteoarthritis through a collaborative research project recognized by the Clinical and Translational Science Institute’s (CTSI) T32 training program.

Working in the laboratories of Kyle Allen, Ph.D., professor in the J. Crayton Pruitt Family Department of Biomedical Engineering, and Daniel Kopinke, Ph.D., associate professor in the Department of Pharmacology and Therapeutics, respectively, Williams and Jones are studying how fatty and fibrotic remodeling develops throughout the joint and contributes to osteoarthritis progression. By combining engineering, cell biology and translational research, they hope to identify new therapeutic targets that could one day lead to less invasive treatments for patients.

The CTSI T32 program pairs trainees from different disciplines to develop collaborative research that addresses complex biomedical challenges with the potential to improve human health.

For Williams, the opportunity aligns naturally with his research in the OrthoBME Lab, where he studies the biological mechanisms that drive osteoarthritis progression and pain. His work examines how inflammation, tissue remodeling and cellular communication contribute to disease development and why some individuals experience more severe symptoms than others.

Jones’ research focuses on mesenchymal stem cells and the cellular mechanisms that lead to fat and fibrotic tissue formation during disease. Together, their complementary expertise allows them to examine osteoarthritis from the cellular level to the whole joint, providing a more complete understanding of how the disease develops.

“Our collaboration started very naturally,” Jones said. “Our PIs met and realized how much potential our work could have. Then they suggested that Yancey and I meet to see if this would be beneficial for us and to brainstorm ideas. From the first meeting, I felt that this was going to be a strong collaboration.”

While osteoarthritis is often associated with cartilage degeneration, Williams and Jones are investigating changes occurring throughout the joint. Their research explores how fatty and fibrotic remodeling contributes to disease progression and whether a better understanding of these processes could ultimately improve treatment options for patients.



BME Ph.D. student Yancey Williams II and pharmacology Ph.D. student Hailey Jones viewing cryosectioned tissue from human osteoarthritis donors.

The interdisciplinary nature of the CTSI T32 program has also broadened how both students approach scientific discovery.

“By combining these perspectives, we can connect molecular and cellular mechanisms to whole-joint disease processes,” Williams said. “This allows us to ask questions that neither field could fully address independently.”

For Jones, collaborating across disciplines has expanded both science and her perspective as a researcher.

“Working with someone from a different discipline has been extremely rewarding,” Jones said. “Having a collaborator who brings techniques and strengths you don’t possess not only strengthens science but also makes me a better scientist. Yancey thinks about science in ways that I don’t, and this not only expands our knowledge but also increases the rigor and impact of our science.”

As their collaboration continues, Williams and Jones hope their research will deepen scientists’ understanding of osteoarthritis while advancing new approaches to improve patient care. Their partnership also reflects the power of interdisciplinary collaboration, demonstrating how engineering and pharmacology can come together to address complex biomedical challenges.

PRESTIGIOUS FELLOWSHIPS

INVESTING IN EXTRAORDINARY TALENT

UF BME doctoral students are earning competitive fellowships at a rapid pace. Since 2020, total fellowship funding has increased 50-fold Our students have received support from the NIH, NSF, USDA and nationally competitive programs such as the McKnight, McNair and GEM fellowships. This increase reflects their talent, determination and innovative research, as well as the strength of our graduate training environment.

50x

INCREASE IN TOTAL FELLOWSHIP FUNDING SINCE 2020



FROM NO. 30 to NO. 6

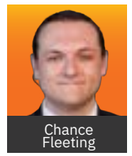
UF BME's national ranking for total active NIH F30/31 awards improved 24 places over the past decade.

2025–2026 Fellowship Recipients



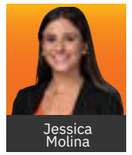
Carleigh Coffin

UF Basic Microbiology & Infectious Disease NIH T32 Fellow



Chance Fleeting

UF Movement Disorders NIH T32 Fellow



Jessica Molina

NIH NIAMS F30 Fellowship



Peter Kowalski

UF Chemistry-Biology Interface NIH T32 Fellow



Clinton Smith

NIH NINDS F31 Fellowship



Kaitlin Southern

NIH NIAMS F31 Fellowship



Yancey Williams

UF Clinical and Translational Science Institute (CTSI) Team NIH T32 Fellow



Eiko Alzamora

UF Alzheimer's Disease and Related Dementias (ADRD) NIH T32 Fellow



Jai Racciopi

Adolescent Brain Cognitive Development (ABCD) START Fellow



Alexander Armstrong

NSF Graduate Research Fellowship



Supraja Ganti

NSF Graduate Research Fellowship



Makenzie Jones

NSF Graduate Research Fellowship



Evangeline Meyler

NSF Graduate Research Fellowship



Veronica Ramos Rodriguez

NSF Graduate Research Fellowship

Two UF BME Postdoctoral Scholars Receive Graduate School Excellence in Research Award



Sandra Mara Ferreira, Phelps lab

Ferreira's research focuses on how pancreatic islets regulate blood glucose, with an emphasis on the signaling molecule gamma-aminobutyric acid, or GABA. Her work examines how GABA, produced by insulin-secreting beta cells, influences cell-to-cell communication within the islet and contributes to normal function as well as diseases such as type 1 diabetes.



Wasif Khan, Fang lab

Khan's research explores how physical activity influences brain health and cognitive aging. Using large-scale datasets and neuroimaging, he studies how both the amount and timing of physical activity affect cognitive performance and brain structure, with the goal of identifying strategies to reduce the risk of neurodegenerative diseases such as Alzheimer's.



Wambui Gachunga, Community & Inclusion, 2025–2026 Attributes of a Gator Engineer Awards

"This recognition means so much to me because it reflects a value that has deeply shaped who I am: Ubuntu, the belief that a person is a person through other people. It is the foundation of how I move through the world, how I show up for others and how I stay rooted in something greater than myself."

67%

OF 2025–2026 ATTRIBUTES OF A GATOR ENGINEER AWARD RECIPIENTS WERE UF BME STUDENTS

CELEBRATING A FEW OF OUR NEWEST GRADUATES

FROM HANDS-ON EXPERIENCE TO REAL-WORLD IMPACT, OUR GRADUATES ARE READY TO SHAPE THE FUTURE OF BIOMEDICAL ENGINEERING



Zoe Schaefer, Ph.D., and Cameron Celeste, Ph.D., Parker Lab alumni. Schaefer is an NIH postdoctoral fellow at the National Institute of Allergy and Infectious Diseases (NIAID) in Aleksandra Nita-Lazar's laboratory, and Celeste is a chemistry and physics instructor at St. Francis High School.

"UF BME gave me opportunities to apply engineering in meaningful ways, from biomechanics research and developing a surgical training model to senior design work with Edwards Lifesciences. Those experiences showed me how engineering can translate directly to better tools, training and patient care."

William Bowers B.S. '26



UNDERGRADUATE STUDENT EXPERIENCE BY THE NUMBERS

>70%
conducted research

>60%
had an internship

>55%
planned to attend graduate school

>30%
planned to enter industry



"UF BME gave me opportunities to grow as both an engineer and a leader through senior design and GRiP. Designing and 3D-printing prosthetic hands for children showed me firsthand how engineering can make a meaningful difference in someone's life."

Kylie Butler, B.S. '26



"UF BME gave me opportunities to turn engineering skills into meaningful solutions, from developing a liver transplant training model and prosthetics for animals to my senior design project with Zimmer Biomet. These experiences challenged me as both an engineer and a leader and showed me the impact thoughtful design can have."

Ana Porcar, B.S. '26



"UF BME gave me the opportunity to explore engineering from so many angles, from machine learning research and senior design to leading GRiP. Those experiences taught me how to turn ideas into solutions that can make a real impact, and I'm excited to build on that foundation as I pursue my master's in Integrated Product Design at the University of Pennsylvania."

Saanvi Kodiganti, B.S. '26



Natalie Geigel, Ph.D.
Gunduz Lab

"UF BME gave me a strong foundation and problem-solving mindset that prepared me for my co-op at Arthrex, where I gained hands-on experience in validation and saw how engineering and quality come together to support safe, effective medical devices."

Leela Zhuo, B.S. '26



Seowung Leem, Ph.D., Fang Lab. Leem is now a postdoctoral associate in the University of Florida Department of Psychology.



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